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OREGANO-AS OZIQ-OVQAT QO‘SHILMASINI OG‘RIQ QOLDIRUVCHI VA O‘TKIR EKSSUDATIV YALLIG‘LANISH FAOLLIGINI BAHOLASH NATIJALARI

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Annotatsiya: *Ushbu maqolada OREGANO-AS oziq ovqat qo‘shilmasini og‘riq qoldiruvchi va o‘tkir ekssudativ yallig‘lanish faolligi baxolash natijalariga bag‘ishlangan. Bunda sichqonlarda sirka kislota keltirib chiqargan og‘riq reaksiyalariga ta’sirini baholash va ekssudativ yallig‘lanishga qarshi faolligi baxolangan.*

Kalit so‘zlar: *OREGANO-AS tibbiyot, oziq-ovqat, farmatsevtika, yalig‘lanish, ekssudativ, sirka kislota, sichqonlar.*

RESULTS OF ASSESSMENT OF OREGANO-AS FOOD ADDITION ON PAIN RELIEF AND ACUTE EXSUDATIVE INFLAMMATION ACTIVITY

Abstract*. In this article, the results of the evaluation of the analgesic and acute exudative inflammatory activity of OREGANO-AS food additive are presented. In this, the effects of the food additive OREGANO-AS on the pain reactions induced by acetic acid in mice were evaluated and its anti-exudative inflammatory activity was evaluated.*

Ключевые слова*: OREGANO-AS лекарство, продукты питания, фармацевтика, воспаление, экссудативное, уксусная кислота, мыши.*

РЕЗУЛЬТАТЫ ОЦЕНКИ ОРЕГАНО- AS КАК ПИЩЕВОЙ ДОБАВКИ ДЛЯ ОКАЗАНИЯ БОЛИ И ОСТРОЙ ЭКСУДАТИВНОЙ ВОСПАЛИТЕЛЬНОЙ АКТИВНОСТИ

Аннотация. *В данной статье представлены результаты оценки анальгетической и острой экссудативной воспалительной активности пищевой добавки ОРЕГАНО-АС. При этом оценивалось влияние пищевой добавки ОРЕГАНО-АС на болевые реакции, индуцированные уксусной кислотой, у мышей. и оценивали его противоэкссудативную воспалительную активность.*

Key words: *OREGANO-AS medicine, food, pharmaceuticals, inflammation, exudative, acetic acid, mice.*

Kirish: Hozirgi vaqtda ushbu o‘simlik ekstraktining xususiyatlarini o‘rganish, yallig‘lanish kabi ba’zi kasalliklarni davolash va oldini olish uchun muqobil usullarni o‘rganishga qiziqish ortib borayotganligi sababli ortib borayotgan qiziqish uyg‘otmoqda. Shu sababli, oreganoning xususiyatlarini dorivor maqsadlarda o‘rganishga qiziqish katta.

Shunday qilib, Oregano (oregano) biologik faol tabiiy manba ekanligini aytish mumkin. Oregano fitokimyoviy jihatdan potentsial alternativ vosita sifatida saratonga qarshi, yallig‘lanishga qarshi, antioksidant va mikroblarga qarshi faolligi tufayli bir qator kasalliklarni muqobil davolash sifatida istiqbolli roli tufayli alohida qiziqish uyg‘otadi. Ushbu o‘simlikning mikroblarga qarshi faolligini efir moyi va uning asosiy tarkibiy qismlari tashkil etadi.

Adabiyyotlar tahlili va metodlari: Zamonaviy tibbiyotda *salvia officinalis* o‘simligi o‘zining yallig‘lanishga va mikroblarga qarshi samarali ta’siri bilan qadrlanadi. Ayniqsa bu o‘simlikdan tayyorlangan dori vositalari og‘iz bo‘shlig‘i va tomoq yallig‘lanishlari kasalliklarini davolashda juda yaxshi natijalarni beradi. Qadim vaqtlardan o‘tkir va surunkali tonzillit, o‘tkir respirator infektsiyalar, stomatit kabi kasalliklarni davolashda *salvia officinalis* dan damlama ko‘rinishida foydalanilgan [1; 165-b, 2; 153-b].

Bundan tashqari ushbu o‘simlikning barcha turlari dezinfektsiyalovchi, balg‘am ko‘chiruvchi, yaralarni davolovchi, biriktiruvchi, yumshatuvchi, antiseptik va qon to‘xtatuvchi xususiyatlarni ham namoyon etishi aniqlangan. Shuning uchun *salvia officinalis* barglari va boshqa tarkibiy qismlaridan Yevropa va MDH mamlakatlarida tabiiy dorivor vosita sifatida foydalaniladi [3; 390-b].

Zamonaviy tibbiyotda *salvia officinalis* o‘simligi o‘zining yallig‘lanishga va mikroblarga qarshi samarali ta’siri bilan qadrlanadi. Ayniqsa bu o‘simlikdan tayyorlangan dori vositalari og‘iz bo‘shlig‘i va tomoq yallig‘lanishlari kasalliklarini davolashda juda yaxshi natijalarni beradi. Qadim vaqtlardan o‘tkir va surunkali tonzillit, o‘tkir respirator infektsiyalar, stomatit kabi kasalliklarni davolashda *salvia officinalis* dan damlama ko‘rinishida foydalanilgan [1; 165-b, 2; 153-b].

Bundan tashqari ushbu o‘simlikning barcha turlari dezinfektsiyalovchi, balg‘am ko‘chiruvchi, yaralarni davolovchi, biriktiruvchi, yumshatuvchi, antiseptik va qon to‘xtatuvchi xususiyatlarni ham namoyon etishi aniqlangan. Shuning uchun *salvia officinalis* barglari va boshqa tarkibiy qismlaridan Yevropa va MDH mamlakatlarida tabiiy dorivor vosita sifatida foydalaniladi [3; 390-b].

MDH mamlakatlarida *Salvia officinalis* barglari "Parodontotsid", "Elakosept", "Stomatofit" kabi dorivor yig‘malar tarkibiga kiritilgan. Ukraina Fanlar akademiyasi Mikrobiologiya va virusologiya institutida 1959 yilda Salvia officinalis barglaridan N.A. Derbentseva boshchiligidagi bir guruh olimlar tomonidan antimikrob xususuyatlarni namoyon etuvchi "Salvin" nomli preparat yaratilgan [4; 44-b].

Natijalar va muhokamalar: Ilmiy o‘rganishlarimizda Shalfey (Salvia) va Tog‘rayxon(Oregano) o‘simliklarini 50:50 nisbatda aralashtirib OREGANO-AS oziq ovqat *qo‘shilmasini og‘riq qoldiruvchi va o‘tkir ekssudativ yallig‘lanish faolligini* o‘rganib chiqdik. Tadqiqot natijalari Microsoft Excel dasturi yordamida o‘rtacha qiymat (M) va o‘rtacha hatolikni (m) aniqlash an’anaviy usullar bilan statistik qayta ishlandi; farqlar -$p<0,05$ ahamiyatli darajasida statistik ahamiyatga ega deb hisoblanadi. Styudent mezoni (t) statistik ishonarli o‘zgarish $p<0,05$ darajasida olindi.

Olingan tajriba natijalari 1-jadvalda keltirilgan bo‘lib, nazorat gypyhi hayvonlaridagi burishishlarning paydo bo‘lishigacha bo‘lgan latent davri 3,043±0,7 daqiqani, *Oregano As* aralashmasi namunasining 250 va 500 mg/kg dozalarida bu ko‘rsatkich mos ravishda 4,38±3,4 va 4,58±30,4 daqiqani tashkil etib, og‘riq reaksiyasining kechikishi nazoratdai 1,4 va 1,5-martaga yuqori bo‘ldi, ammo ular orasida statistik ishonarli farqlar kuzatilmadi.

Sirka kislotasi natijasida kelib chiqadigan burishishlar soni nazorat guruhi sichqonlarida 28,0±32,3; o‘rganilayotgan namunaning 250 va 500 mg/kg dozalarida 17,0±2,1 va 16,2±1,7 tashkil etdi va nazoratda xar ikkala dozada statistik ishonarli farqlapga erishildi ($p<0,01$; $p<0,005$). Og‘riq qoldiruvchi samaradorlik namunada nazorat guruhiga nisbatan 39,3 va 42,1% ni tashkil etdi (2-jadval).

1-jadval

Oregano As oziq-ovqat qo‘shilmasining sichqonlarda sirka kislotasi keltirib chiqaradigan og‘riq reaksiyalariga ta’sirini baholash (M±m; n=6)

Guruhlar	Doza, ml, mg/kg	Latent davri, daq.	Burishishlar soni	Og‘riq qoldiruvchi samaradorlik, %
Nazorat	0,2	3,04±0,7	28,0±2,3	
Oregano As	250	4,38±30,4	17,0±2,1*	39,3
	500	4,58±30,5	16,2± l,7**	42,1

*p<0,0l; **p<0,005;-nazoratga nisbatan ishonchliligi

Shunday qilib, og‘riq reaksiyalarining kamayishi o‘rganilgan 250 va 500 mg/kg dozalarda nazorat guruhi sichqonlariga nisbatan statistik ahamiyatli farqqa erishsada, samaradorlik 50% ga farq qilmadi.

Tajribamizning keyingi qismida aynan mana shu sichqonlar guruhiga sirka kislotasining 0,75% suvli eritmasi qorin bo‘shlig‘iga kiritilganidan so‘ng 2 soat o‘tgach dekapitatsiya qilinib qorin bo‘shlig‘idagi ekssudatsiya yig‘ib olindi va ekssudativ yallig‘lanishga qarshi faolligi nazorat guruhi hayvonlariga nisbatan qiyoslab baholandi va natijalar 2-jadvalda keltirildi.

2-jadval

“Oregano As” oziq-ovqat qo‘shilmasini sichqonlarda sirka kislotasi keltirib chiqaradigan ekssudativ yallig‘lanishga qarshi faolligi (M±m; n=6)

Guruhlar	Doza ,mg/ kg	Ekssudatsiya hajmi, ml	Ekssudatsiyaga qarshi samaradorlik, %
Nazorat	2,0 ml	0,6±0,029	
Oregano As	250	0,42±0,05*	30,7
	500	0,3±0,04**	50,0

*p<0,05; **p<0,005 nazorat guruhiga nisbatan ishonchliligi

Sichqonlardagi ekssudatsiya hajmi nazorat guruhi sichqonlarida 0,6±0,029 ml bo‘lib, *Oregano As* aralashmasining 250 mg/kg dozasida 0,42±0,05 ml; 500 mg/kg dozasida 0,3±0,04 ml tashkil etdi va tajriba guruhlaridagi sichqonlar ekssudatsiyasi hajmi nazorat guruhi bilan taqqoslanganda har ikkala dozada ham statistik ishonarli natija ko‘rsatdi (mos ravishda p<0,01; p<0,005).

Ekssudatsiyaga qarshi samaradorlik *Oregano As* aralashmasining 250 va 500 mg/kg dozalari kiritilgan sichqonlarda mos ravishda 30,7% va 50% ni tashkil etdi. Shunday qilib, ekssudatsiyaga karshi faollik sichqonlar qorin bo‘shlig‘idagi ekssudatsiya hajmining kamayishiga ko‘ra baholanganda, ekstraktning 250 va 500 mg/kg dozalarida nazoratga nisbatan statistik ishonarli fapqlapga erishgan bo‘lsada, uning 500 mg/kg dozasida ekssudatsiyaning kamayishi 50%ni tashkil etdi va qo‘llanilgan modelning talabiga binoan samaradorlik 50% ni tashkil etdi.

Hulosa:O‘tkazilgan tajribalardan xulosa shuki, *Oregano As* aralashmasi 250 va 500 mg/kg dozalarda sichqonlarda og‘riq qoldiruvchi va o‘tkir ekssudativ yallig‘lanishga qarshi faolligi o‘rganilganda, har ikkala usulda ham nazorat guruhidan statistik ahamiyatli farqlarga erishildi ($p<0,01$; $p<0,005$). Og‘riq qoldiruvchi faollik *Oregano As* aralashmasining 250 va 500 mg/kg dozalarida 39,3 va 42,1%, ekssudatsiyaga qarshi faollik esa 250 mg/kg dozada 30,7% bo‘lib, o‘tkazilgan tajribalarning talabiga ko‘ra samaradorlik 50% dan kam bo‘ldi. Shalfey (Salvia) va Tog‘rayxon(Oregano) o‘simliklarini 50:50 nisbatda aralashtirib OREGANO-AS oziq ovqat *qo‘shilmasini og‘riq qoldiruvchi va o‘tkir ekssudativ yallig‘lanish faolligini* o‘rganib chiqdik va olingan natijalarga binoan biz ushbu aralashmadan halq tabobati uchun yalliglanish kasalliklarini davolash maqsadida oziq-ovqat qo‘shilmasi olish uchun tavsiya etiladi.

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DINAMIKA TUSHUNCHASI VA ASOSIY QONUNIYATLARI

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Annotatsiya: *Maqolada dinamikaning asosiy prinsiplari, dinamika hayotda qanday o‘rin egallashi, boshqa fanlar bilan bog‘liqligi, nazariy asoslari, shuningdek, umumiy teoremalari va qonunlari muhokama qilingan.*

Kalit so‘zlar: *dinamika, mexanik harakat, elastik deformatsiya, plastik deformatsiya, gidrodinamika, kuch, massa, tezlanish, og‘irlik kuchi tezlanishi, og‘irlik kuchi.*

CONCEPT AND BASIC LAWS OF DYNAMICS

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Abstract: *The article discusses the main principles of dynamics, how dynamics occupies a place in life, its connection with other sciences, theoretical foundations, as well as general theorems and laws.*

Key words: *dynamics, mechanical movement, elastic deformation, plastic deformation, hydrodynamics, force, mass, acceleration, acceleration of gravity, force of gravity.*

KIRISH (ВВЕДЕНИЕ / INTRODUCTION)

“Dinamika” so‘zi yunoncha “dunamis” (quvvat, kuch) so‘zidan kelib chiqadi va ko‘pincha harakat va kuchlar o‘rtasidagi munosabatlarni, shuningdek, jarayonlar va o‘zgarishlarni o‘rganadigan sohalarni anglatadi. Dinamika fizikada, biologiyada, iqtisodiyotda va boshqa ilmiy sohalarda muhim tabiiy va ijtimoiy jarayonlarni tushunishga yordam beradi.

Dinamika hayotda qanday o‘rin egallaydi:

1. Fizika: Dinamika, mexanika asosan, jismlarning harakati va ularga ta’sir etuvchi kuchlarni o‘rganadi. Bu ilmiy soha muhandislik va texnologiyada qo‘llaniladi, masalan, transport vositalarining harakati, bino va inshootlarning chidamliligini hisoblashda.

2. Biologiya: Organizmning biologik jarayonlari, masalan, qondagi hujayralarning, fermentlarning yoki boshqa molekulalarining harakati dinamikani o‘z ichiga oladi. Bu tadqiqotlar meditsina va farmakologiyada muhim ahamiyatga ega.

3. Ijtimoiy fanlar: Dinamika ijtimoiy tadqiqotlarda ham muhimdir. Jamiyatlar, iqtisodiyot va siyosiy tizimlarning o‘zgarishi va rivojlanishi, ijtimoiy munosabatlar va ularning dinamikasi o‘rganiladi.

4. Psixologiya: Inson harakatlarining motivlari va hissiyotlari, shuningdek, insonlar o‘rtasidagi munosabatlar dinamikasi psixologiyada o‘rganiladi.

5. Ta’lim: Ta’lim jarayonlarida dinamikalar o‘rganilishi, talabalarning o‘qish uslublari, dars jarayonida faollik va o‘zaro ta’sirlari dinamikasini o‘rganish orqali o‘qitish metodlarini rivojlantirishga yordam beradi.

Dinamika hayotimizda doimiy ravishda mavjud va ko‘plab sohalarning rivojlanishida muhim rol o‘ynaydi. Uning o‘rganilishi nafaqat nazariy jihatdan, balki amaliyotda ham muhim ahamiyatga ega. Harakat va o‘zgarishlarni tushunish orqali biz atrofimizdagi olamni yaxshiroq bilib olamiz va turli muammolarni hal etishda yordam beradigan yechimlarni topamiz.

ADABIYOTLAR TAHLILI VA METODOLOGIYA (ЛИТЕРАТУРА И МЕТОДОЛОГИЯ / METHODS)

Dinamika - mexanikannng jismlar mexanik harakatini ularga ta’sir qiladigan kuchlar bilan bog‘lab o‘rganadigan bo‘limi. Dinamikada statikaning murakkab kuchlar sistemasini sodda holga keltirish qonuniyatlaridan va kinematikadagi harakatni ifodalash usullaridan keng foydalaniladi. Dinamikaning bevosita vazifasi berilgan (qo‘yilgan) kuchlar bo‘yicha harakatni aniqlash, agar harakat ma’lum bo‘lsa, jismga qo‘yilgan kuchlarni topishdan iborat. Odatda, dinamika deganda yoruglik tezligidan ancha kichik tezlikda harakatlanayotgan har qanday moddiy jismning harakatini o‘rganadigan an’anaviy (klassik) dinamika tushuniladi [1, 3,5].O‘rganiladigan ob’yektning xossalariga qarab:

1) moddiy nuqta va moddiy nuqtalar sistemasi dinamikasi;

2) qattiq jism dinamikasi;

3) o‘zgaruvchan massali jism dinamikasi;

4) elastik yoki plastik deformatsiyalanadigan jism dinamikasi;

5) suyuqlik va gaz dinamikasi (mas, gidrodinamika, aerodinamika, gaz dinamikasi) bo‘linadi.

Dinamikada avval moddiy nuqtaning harakat qonunlari aniqlanadi, so‘ngra moddiy nuqtalar sistemasi uchun bu qonunlar umumlashtiriladi, massa jismlarning moddiy ifodasi sifatida qaraladi.

Dinamika asosini Nyutonning mexanika qonunlari tashkil qiladi. Dinamikada ikkita birliklar sistemasi ishlatiladi:

1) fizik sistema [uzunlik birligi (1 metr), vaqt birligi (1 sekund), massa birligi (1 kilogramm-massa) olinadi];

2) texnik sistema [uzunlik, vaqt birligi va kuch birligi (1 kilogramm-kuch)]. Dinamikada moddiy nuqtalar va sistemalarning harakati Nyutonning qonunlari asosida tuzilgan differensial tenglamalar asosida aniqlanadi.

Dinamikada moddiy nuqta tebranma harakatini tekshirish uchun differensial tenglamalardan foydalaniladi va harakat qonunlari keltirib chiqariladi. Bundan tashqari dinamikada harakatni tekshirish uchun nisbatan soddalashtirilgan uch xil usul ham keltiriladi. Bular dinamikaning umumiy teoremalari degan nom bilan kiritilgan [2, 6,9].

NATIJALAR (РЕЗУЛЬТАТЫ / RESULTS)

Amalda dinamikaning quyidagi umumiy teoremalari juda keng tatbiq qilinadi:

1) sistema harakat miqdorining o‘zgarishi haqidagi teorema: sistema harakat miqdori differensiali tashqi kuchlar elementar impulslarining geometrik yig‘indisiga teng. Bu teorema suyuqliklar harakatini tekshirishda, zarba nazariyasida, reaktiv harakatlar nazariyasida keng tatbiq qilinadi;

2) sistema kinetik momentining o‘zgarishi haqidagi teorema: sistemaning biror O markaziga nisbatan kinetik momentining vektori uchining tezligi sistemaga qo‘yilgan tashki kuchlarning shu nuqtaga nisbatan bosh momentiga teng. Bu teorema giroskoplar nazariyasida, zarba nazariyasida, sayyoralar harakatini tekshirishda, turbinalar nazariyasida keng tatbiq qilinadi;

3) sistema kinetik energiyasining o‘zgarishi haqidagi teorema: sistemaning ixtiyoriy siljishidagi kinetik energiyasi o‘zgarishi ichki va tashqi kuchlarning shu siljishda bajargan ishlari yig‘indisiga teng.

Sistemaga potensial kuchlar qo‘yilsa, sistema kinetik va potensial energiyalarining yig‘indisi o‘zgarmay qoladi. Kinetik energiyaning o‘zgarish tezligi barcha ichki va tashki kuchlar quvvatlari yig‘indisiga teng. Dinamikada umumlashgan koordinatalar va umumlashgan kuchlar tushunchalari kiritilib, kinetik energiyani bu yangi koordinatalarda ifodalash uchun Lagranj ikkinchi tur tenglamalari keltirib chiqariladi. Harakatni tadqiq qilishning umumiy usullaridan tashqari dinamikada bir qator xususiy masalalar: giroskoplar nazariyasi, mexanik tebranishlar nazariyasi va boshqalar ham o‘rganiladi. Dinamika usullarining ayrim sohalarga tatbiq qilinishi

tufayli osmon mexanikasi, tashqi ballistika, samolyotlar dinamikasi, raketalar dinamikasi kabi sohalar paydo bo‘ldi [4,7, 8].

MUHOKAMA (ОБСУЖДЕНИЕ / DISCUSSION)

Hozirda 10-sinf fizika darsligida “dinamika” bo‘limi, asosan, jismlarning harakati va ularning harakatiga ta’sir etuvchi kuchlar bilan bog‘liq bo‘lgan qonunlarni o‘rganadi. Quyida 10-sinf darsligida dinamika haqida asosiy ma’lumotlar keltirilgan:

Dinamikaning asosiy qonunlari:

- Nyutonning birinchi qonuni (inertsiya qonuni): Agar jismga tashqi kuch ta’sir etmasa, u xarakat holatini saqlab qoladi (ya’ni, tinch holda qolishi yoki bir tekis harakatni davom ettirishi).

- Nyutonning ikkinchi qonuni: Jismning tezligi o‘zgarishi (ya’ni, shiddati) unga ta’sir etayotgan kuchga to‘g‘ri proporsional va massaga teskari proportsional. Bu tenglama $= F/m$, bu yerda F kuch, m massa va a tezlikning o‘zgarishidir.

- Nyutonning uchinchi qonuni (harakatning ta’siri va qarshi ta’siri qonuni): Har qanday kuch uchun harakatning ta’siri va qarshi ta’siri bor, ya’ni, bir jism ikkinchisiga kuch ta’sir etganida, ikkinchisi birinchi jismga qarshi teng kuch ta’sir qiladi.

Kuchlar: Og‘irlik kuchi - Jismning yerga tortishish kuchi, $F = mg$ formula orqali ifodalanadi (bu yerda m - massa, g -yerdagi og‘irlik tezlanishi).

Sirt kuchlari: Jism boshqa bir jism yoki sirt bilan ta’siri natijasida hosil bo‘ladigan kuchlar.

Harakat turlari: To‘g‘ri chiziqli harakat: Jismning to‘g‘ri chiziq bo‘ylab harakati.

Periodik harakat: Vaqt davomida takrorlanadigan harakat (masalan, pendul harakati).

Dinamika va mexanika asoslari:

Dinamika mexanikaning tarmog‘i bo‘lib, jismlarning harakati va kuchlar o‘rtasidagi bog‘lanishlarni o‘rganadi. Ushbu bilimlar muhandislik, transport, aerodinamika kabi sohalarda qo‘llaniladi.

Dinamikada kuch birligi (N, $kg \cdot m/s^2$), tezlik (m/s), tezlanish (m/s^2), massa (kg) kabi asosiy fizik o‘lchovlar ishlatiladi.

XULOSA (ЗАКЛЮЧЕНИЕ / CONCLUSION)

Dinamika jism harakatining asosiy omillari, ya’ni kuchlar va massalar o‘rtasidagi munosabatlarni o‘rganadi. Jismning harakati haqida to‘g‘ri tushuncha hosil qilish uchun Nyuton qonunlarini bilish zarur. Dinamika bizga jismlarning harakatini, vaqt, tezlik va kuchlarni birgalikda o‘rganish imkonini beradi.

Dinamika haqida chuqurroq o‘rganish, real hayotdagi harakatlangan jismlarning kuzatuvda qo‘llanilayotgan barcha fizika qonunlari va formulalarini puxta tushunishga imkon beradi.

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ИЗУЧЕНИЕ МОРФОФИЗИОЛОГИЧЕСКИХ ОСОБЕННОСТЕЙ САХАРНОГО СОРГО (SORGHUM SACCHARATUM L.) В УСЛОВИЯХ ИНТРОДУКЦИИ

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Аннотация: *В данной статье представлены результаты исследования морфофизиологических особенностей сахарного сорго (Sorghum saccharatum L.) в условиях интродукции в Ботаническом саду Национального университета Узбекистана. Проведены исследования всхожести семян при различных температурах, изучена динамика роста и развития растений, а также определены урожайность зеленой массы и зерна. Полученные данные свидетельствуют о высокой продуктивности и адаптационных возможностях сахарного сорго в условиях Узбекистана, что делает его перспективной культурой для кормопроизводства и получения сахаросодержащих продуктов. Анализ полученных результатов позволяет рекомендовать сахарное сорго для дальнейшего использования в сельском хозяйстве республики.*

Ключевые слова: *сахарное сорго, интродукция, морфофизиологические особенности, всхожесть семян, рост, развитие, урожайность, зеленая масса, зерно.*

Abstract: *This article presents the results of a study on the morphophysiological characteristics of sweet sorghum (Sorghum saccharatum L.) under introduction conditions at the Botanical Garden of the National University of Uzbekistan. The research included seed germination studies at various temperatures, the dynamics of plant growth and development, as well as the determination of green mass and grain yield. The obtained data indicate high productivity and adaptive capabilities of sweet sorghum in the conditions of Uzbekistan, making it a promising crop for forage production and the production of sugar-containing products.*

Keywords: *sweet sorghum, introduction, morphophysiological characteristics, seed germination, growth, development, yield, green mass, grain.*

ВВЕДЕНИЕ. Данное исследование необходимо для интенсификации кормопроизводства в Узбекистане и поиском высокопродуктивных, засухо- и солеустойчивых культур, пригодных для выращивания в условиях ограниченного водного режима и засоленных почв, характерных для многих регионов республики. Сахарное сорго, благодаря своим биологическим особенностям, представляется перспективной культурой для решения этих задач. Его использование позволит повысить эффективность использования земельных ресурсов, снизить затраты на производство кормов и улучшить качество рационов сельскохозяйственных животных.

МЕТОДИКА ИССЛЕДОВАНИЙ. Постановка полевых опытов, фенологические учёты и наблюдения за ростом и развитием растений, определение всхожести и энергии прорастания семян, сбор урожая проводились согласно Методике государственного сортоиспытания сельскохозяйственных культур и другим [4,5,3,2,1,8].

Исследование проводилось в 2023 - 2024 годах в Ботаническом саду Национального университета Узбекистана имени М. Улугбека. Эксперимент закладывался на участках размером 6х5м с четырёхкратной повторностью. Использовались стандартные агротехнические приёмы, адаптированные к местным условиям.

Всхожесть семян является важным показателем, который отражает их жизнеспособность и способность к прорастанию в благоприятных условиях. Этот параметр включает несколько ключевых аспектов: качество семян, адаптация к условиям, экономическая эффективность, планирование посевов и устойчивость к стрессам.

Учет урожайности изученных растений проводился в зависимости от их биологических особенностей и в соответствии с рекомендациями по возделыванию. Растительный материал для анализов отбирался с каждой учётной делянки. Измерялась высота растений, количество листьев на растении.

РЕЗУЛЬТАТЫ И ИХ ОБСУЖДЕНИЕ.

Сорго является важнейшей кормовой, технической и продовольственной культурой, которая занимает широкий ареал возделывания во всем мире. Сахарное сорго однолетнее растение, высота и количество стеблей зависят от сорта, плодородия почвы и климатических условий. Сахарное сорго обладает высокой отавностью, отличается соле- и засухоустойчивостью.

Оптимальным сроком посева семян является период, когда среднесуточная температура почвы на глубине 10 см. достигает для зернового сорго 14-15^{o}C, для сахарного сорго – 15-16^{o}C. Оптимальной глубиной заделки семян сорго следует считать глубину 4-6 см.

Всхожесть семян определялась в термостате при температурах 12-14°C, 16-18°C и 20-22°C по стандартной методике с трёхкратной повторностью. Подсчитывалась энергия прорастания (в течение 3-4 суток) и лабораторная всхожесть (в течение 7-8 суток) (Табл.1).

Таблица 1.

Всхожесть и энергия прорастания семян сахарного сорго при разных температурах.

Растение	Температура (°C)	Энергия прорастания (%)	Лабораторная всхожесть (%)
Сахарное сорго	12-14	14,9 ± 0,3	18,0 ± 0,8
	16-18	49,1 ± 2,3	58,8 ± 2,8
	20-22	84,3 ± 3,9	99,2 ± 1,4

Лабораторная всхожесть показывает процент семян, которые успешно прорастают в контролируемых условиях. Согласно приведенным данным, при температуре 12-14°C лабораторная всхожесть семян сахарного сорго составила 18,0%±0,8%, что говорит о низком уровне всхожести. При температуре 16-18°C лабораторная всхожесть увеличивается до 58,8%±2,8%, что указывает на улучшение условий для прорастания. При температуре 20-22°C лабораторная всхожесть достигла 99,2%±1,4%, что свидетельствует о том, что почти все семена прорастают в этих условиях.

Энергия прорастания отражает процент семян, которые начинают прорастать при заданной температуре. Она показывает жизнеспособность семян и их активность прорастания. При температуре 12-14°C энергия прорастания составляет 14,9%±0,3%. При температуре 16-18°C энергия прорастания значительно увеличивается до 49,1%±2,3%, что указывает на более благоприятные условия для прорастания. При температуре 20-22 °C энергия прорастания достигает 84,3% ± 3,9%, что говорит о том, что почти 85 семян из 100 начнут прорастать.

Таким образом, можно сделать вывод, что температура играет ключевую роль в прорастании семян сахарного сорго: чем выше температура, тем выше как энергия прорастания, так и лабораторная всхожесть.

Фенологические наблюдения темпов роста и развития сахарного сорго проводились с интервалом в 10 дней, регистрировались фазы развития растений: появление всходов, проростков, первые настоящие листья, цветение, созревание и спелость (Табл.2).

Таблица 2.

Продолжительность периодов развития сахарного сорго

п/н	Вегетативный период	Начало-завершение	Продолжительность (дни)
1	Всходы	30 мая – 4 июня	5
2	Появление проростков	5 июня – 7 июня	3
3	Первые настоящие листья	8 июня – 10 июня	4
4	Вегетативный рост	11 июня – 15 июля	35
5	Цветение	16 июля – 15 августа	30
6	Созревание и спелость	16 августа – 30 сентября	45

Высота изученных растений сахарного сорго составила 240-325 см., количество листьев 18-20. Продолжительность вегетационного периода составила 120-125 дней.

Выбор способа уборки урожая зависит от целей и задач. Уборку зерна сахарного сорго проводят в фазу окончания восковой спелости, а для зеленой массы – перед цветением. Урожайность зеленой массы сахарного сорго за два укоса составляет 670-720 ц/га, семян – 27-29 ц/га. Семена хранятся в высушенном состоянии (влажность не более 14 %). Биологическая особенность сорго заключается в том, что при созревании зерна листостебельная масса ещё зеленая. При этом влажность листьев составляет 60%, а стеблей – 70-75% (Табл.3).

Таблица 3.

Урожайность зеленой массы и зерна сахарного сорго

Растение	Урожайность зеленой массы (ц/га)	Урожайность зерна (ц/га)
Сахарное сорго	670 ± 28,1	27,1 ± 1,3

Изучена также динамика накопления сахаров в стеблях растений. Согласно данным Х. Мўминова (1982), содержание сахаров в стеблях сахарного сорго динамично изменяется в течение вегетационного периода. В фазе кущения оно составляет около 6,7%, в фазе цветения – 11,4%, достигая максимума (17,7%) в фазе молочной спелости и несколько снижаясь до 16,5% в фазе восковой

спелости [6]. В наших исследованиях максимальное содержание моно- и дисахаридов в стеблях сахарного сорго в фазе восковой спелости составило 16,7-19,3% [7].

ВЫВОДЫ. Сахарное сорго показало высокую адаптивность к условиям интродукции в Ботаническом саду НУУз. Оптимальная температура для прорастания семян сахарного сорго составляет 20-22°С. Урожайность зеленой массы и зерна у исследованных растений достаточно высока и сопоставима с данными, полученными в других регионах с аналогичными климатическими условиями. Сахарное сорго является перспективной культурой для кормопроизводства и получения сахаросодержащих продуктов в Узбекистане.

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ME’DA OSTI BEZINING REVMATOID ARTRIT VA OSTEOARTROZDA BEVOSITA SHIKASTLANISHLARI VA OLINGAN NATIJALARNI SOLISHTIRISH, TAHLIL QILISH

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ANNOTATSIYA

Maqolada Revmatoid artrit va osteoartroz kasalliklarini me’da osti bezi shikastlanishini keltirib chiqaruvchi omillarni aniqlash maqsadida ikkata guruh belgilari bir-biri bilan solishtirildi. Revmatoid artrit va osteoartroz kasalliklarida me’da osti bezi shikastlanishi yallig‘lanish jarayonida shikastlangan bo‘g‘imlar soni, bo‘g‘imlardagi funksional yetishmovchilik bilan bog‘liqligi yo‘qligi aniqlandi.

Kalit so‘zlar: revmatoid, osteoartroz, artrid, rentgenologik, me’da osti bezi.

АНАЛИЗ ПРЯМЫХ ПОРАЖЕНИЙ ПОДЖЕЛУДОЧНОЙ ЖЕЛЕЗЫ ПРИ РЕВМАТОИДНОМ АРТРИТЕ И ОСТЕОАРТРОЗЕ И СРАВНЕНИЕ, ПОЛУЧЕННЫЕ РЕЗУЛЬТАТЫ

АННОТАЦИЯ

В статье сравнивались симптомы двух групп с целью выявления факторов, вызывающих повреждение поджелудочной железы при ревматоидном артрите и остеоартрозе. Было обнаружено, что повреждение поджелудочной железы при ревматоидном артрите и остеоартрозе не связано с количеством

суставов, поврежденных воспалительным процессом, функциональной недостаточностью суставов.

***Ключевые слова**: ревматоидный, остеоартроз, артрит, рентгенологический, поджелудочная железа.*

Revmatoid artrit (RA) va osteoartroz (OA) kasalliklari bo‘g‘im sistemasi kasalliklari bo‘libgina qolmay, ma’lum darajada ichki a’zolarga ham o‘z ta’sirini o‘tkazadi, jumladan, me’da osti beziga ham. Bu kasalliklarda me’da osti bezi shikastlanib, klinik jihatdan har doim ham namoyon bo‘lavermaydi, laborator va instrumental tekshirishlarda aniqlanadi. Bu ikkala kasallikning qaysi birida me’da osti bezi shikastlanishi ko‘proq uchrashi, kasallikning qanday kechishi va klinik ko‘rinishlarida ko‘proq uchrashi, bu kasalliklarda me’da osti bezi (MOB) shikastlanishini keltirib chiqaruvchi omillarni aniqlash maqsadida ikkala guruh quyidagi belgilari orqali bir-biri bilan solishtirildi.

Agar revmatoidartrit va osteoartrozda me’da osti bezi bevosita shikastlansa, demak kasallik qancha davom etsa, shikastlanish shuncha ortib borishi kerak. 1 – va 2 – jadvallarda revmatoid artrit va osteoartroz kasalliklarida me’da osti bezining kasallik davomiyligiga bog‘liqligi tasvirlangan.

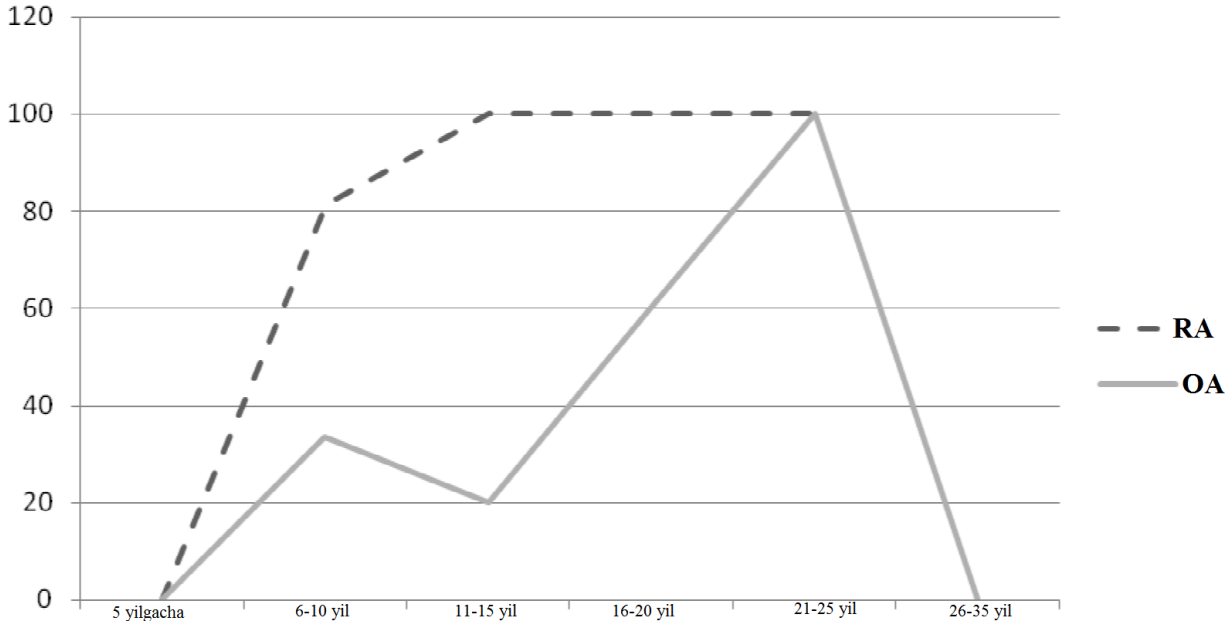
1 –jadval. RA kasalliklarining davomiyligi

Kasallik davomiyligi	Bemorlar soni	
	Asosiy	nazorat
5 yilgacha		8
6-10 yil	13	3
11-15 yil	5	
16-20 yil	5	
21-25 yil	4	

2-jadval.
OA kasalliklarining davomiyligi

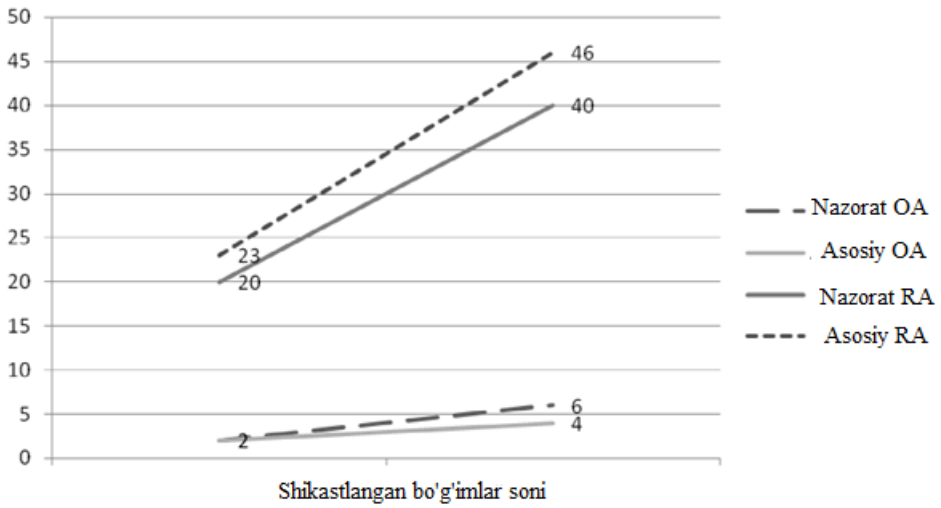
Kasallik davomiyligi	Bemorlar soni	
	Asosiy	nazorat
5 yilgacha		2
6-10 yil	1	2
11-15 yil	1	4
16-20 yil		
21-25 yil	1	
26-35 yil		1

Buning grafik ko‘rinishi quyidagicha bo‘ladi



Bu diagrammadan revmatoid artritda kasallik davomiyligi uzaygan sari MOB shikastlanishi oshib borgani, osteoartrozda esa kasallik davomiyligiga bog‘liq emasligi ko‘rinib turibdi.

Yuqorida aytilganidek, bemorlarda shikastlangan bo‘g‘imlar soni RA li bemorlarda 20 – 46 ta, OA li bemorlarda2 – 6ta, shulardan asosiy guruhdagi RA li bemorlarda 23 – 46ta, OA li bemorlarda2 – 4 ta bo‘g‘im shikastlangan, nazorat guruhda esa RA li bemorlarda 20 – 40 ta, OA li bemorlarda 2 - 6 ta bo‘g‘im shikastlanganligi aniqlandi (3.2-diagramma).



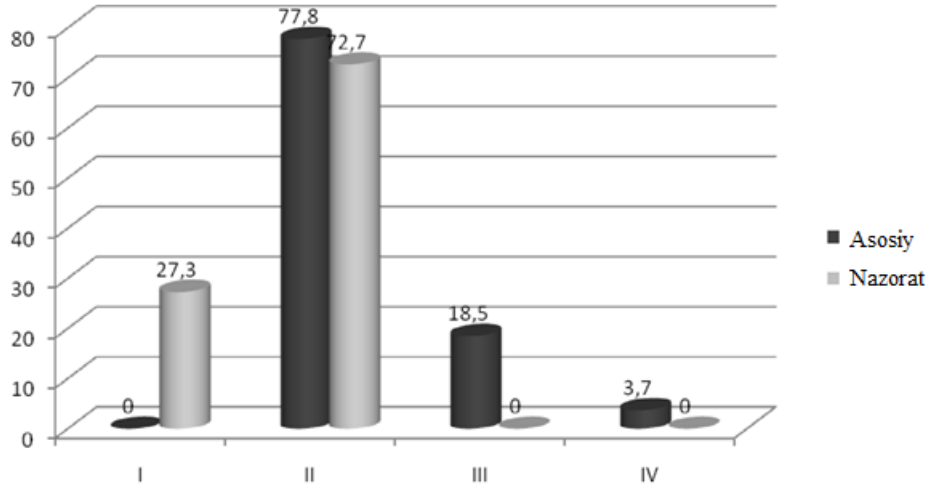
Shikastlangan bo‘g‘imlar sonining MOB shikastlanishi bilan bog‘liqligi

Ikkala guruhni solishtirganda RA li bemorlarda shikastlangan bo‘g‘imlar soni orasidagi farq unchalik katta emas, OA li bemorlarda esa aksincha, nazorat guruhidagi

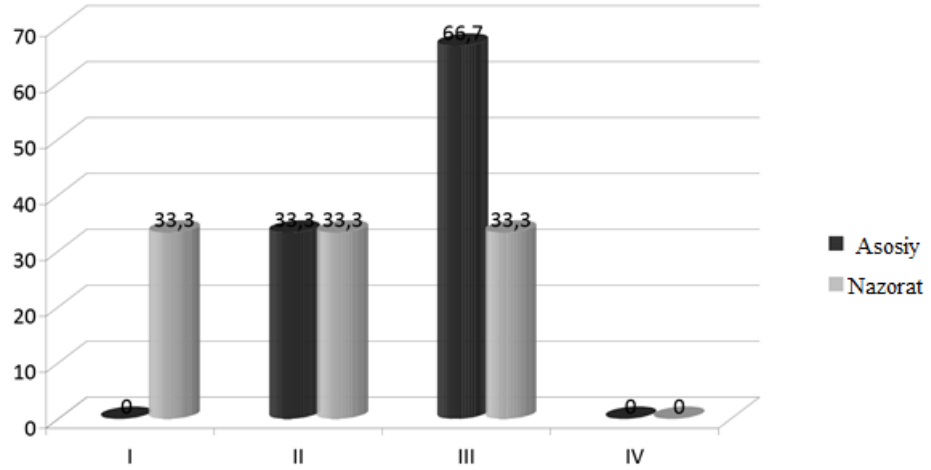
bemorlarda nisbatan ko‘proq bo‘g‘imlar shikastlangan. Bundan kelib chiqadiki, MOB ga shikastlangan bo‘g‘imlar soni ta’sir etmaydi.

Asosiy guruhda RA li bemorlarning 21 tasida II-chi (77,8%), 5 tasida III-chi (18,5%), 1 tasida IV-chi (3,7%) rentgenologik bosqichlari aniqlandi, I-chi rentgenologik bosqichli bemorlar yo‘q. OA li bemorlarning1tasida II-chi (33,3%), 2 tasida III-chi (66,7) rentgenologik bosqichlari aniqlandi, I- va IV-chi rentgenologik bosqichli bemorlar yo‘q.

Nazorat guruhida esa RA li bemorlarning 3 tasi I–chi (27,3%), 8 tasi II-chi (72,7%) rentgenologik bosqichida, III- va IV- rentgenologik bosqichli bemorlar yo‘q. OA li bemorlarning 3 tasi I–chi (33,3%), 3 tasi II-chi (33,3%) va yana 3 tasi III-chi (33,3%) rentgenologik bosqichida, IV-chi rentgenologik bosqichli bemorlar yo‘q (3-va 4-diagrammalar).



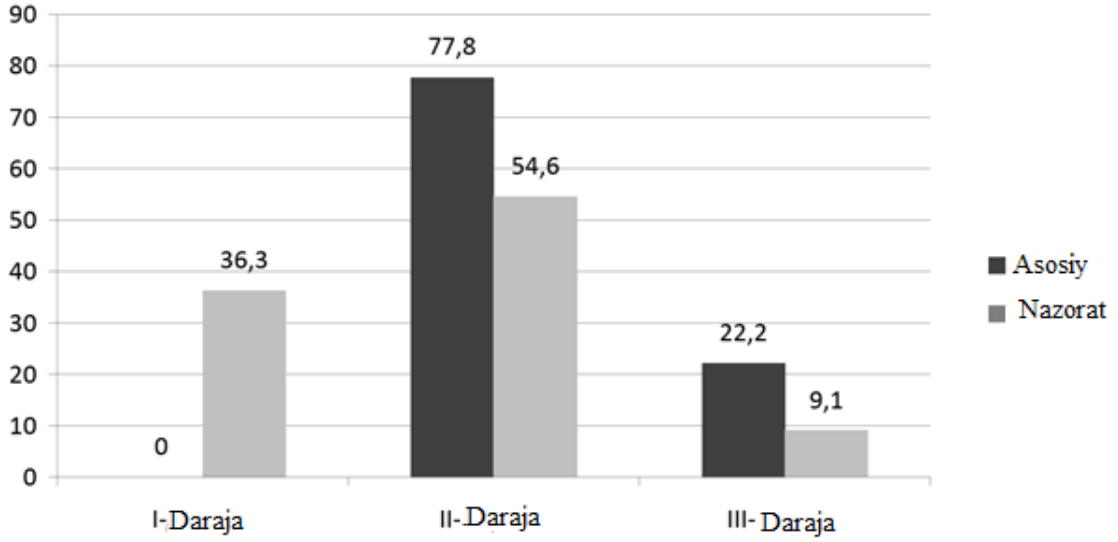
3. RA rentgenologik bosqichlarining MOB shikastlanishi bilan bog‘liqligi



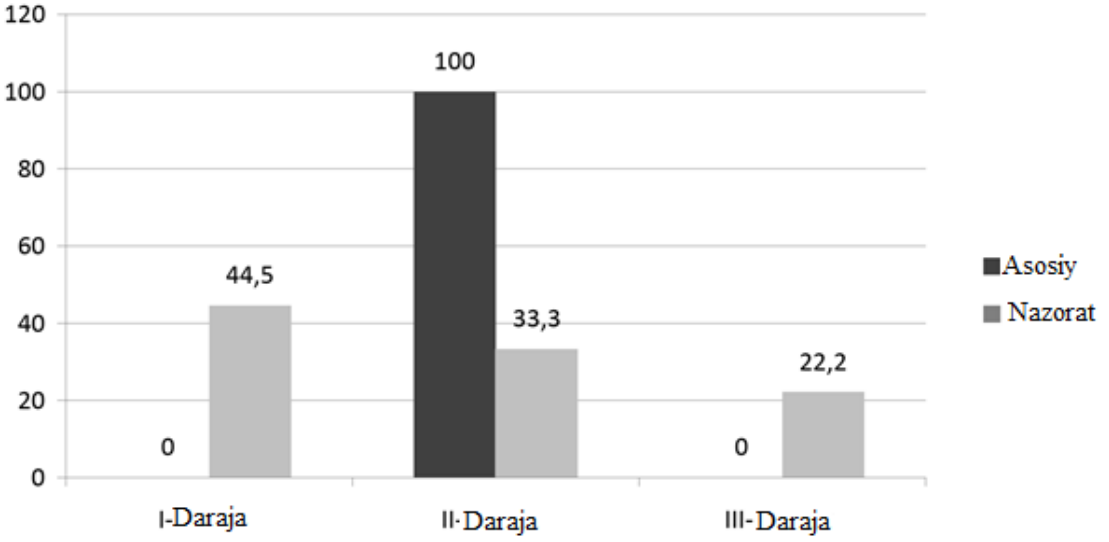
4. OA rentgenologik bosqichlarining MOB shikastlanishi bilan bog‘liqligi

Bu tahlillar shuni ko‘rsatadiki, MOB shikastlanishi belgilari bo‘g‘imlarida chuqurroq o‘zgarish bo‘lgan bemorlarda ko‘proq.

MOB shikasatlanishini kasallikning muhim belgilaridan biri bo‘lgan bo‘g‘imlardagi funksional yetishmovchilik bilan bog‘liqligini tahlil qilinganda quyidagi ko‘rsatgichlar belgilandi (5-va 6-diagrammalar): asosiy guruhda RA li bemorlarda bo‘g‘im funksional yetishmochiligi (BFE) ning I darajasi yo‘q, II darajasi 21 tasida (77,8%), III darajasi 6 tasida (22,2%), OA li bemorlarda BFE ning I va III - darajasi yo‘q, II darajasi hamma bemorda kuzatildi. Nazorat guruhida esa RA li bemorlarda BFE ning I darajasi 4 tasida (36,3%), II darajasi 6 tasida (54,6%), III darajasi1tasida (9,1%), OA li bemorlarda BFE ning I darajasi 4 tasida (33,3%), II darajasi 3 tasida, III –darajasi 2 tasida kuzatildi.



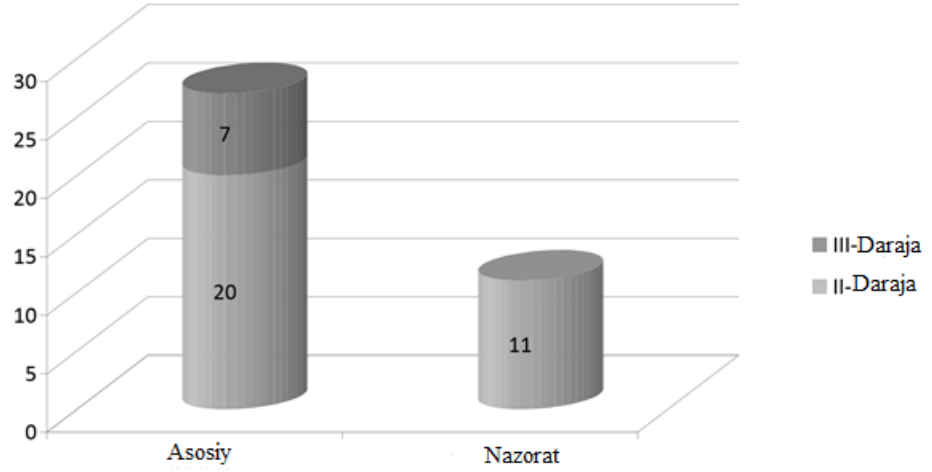
5. RA kasalligida bo‘g‘imlar funksional yetishmovchiligining MOB shikastlanishi bilan bog‘liqligi



6. OA kasalligida bo‘g‘imlar funksional yetishmovchiligining MOB shikastlanishi bilan bog‘liqligi

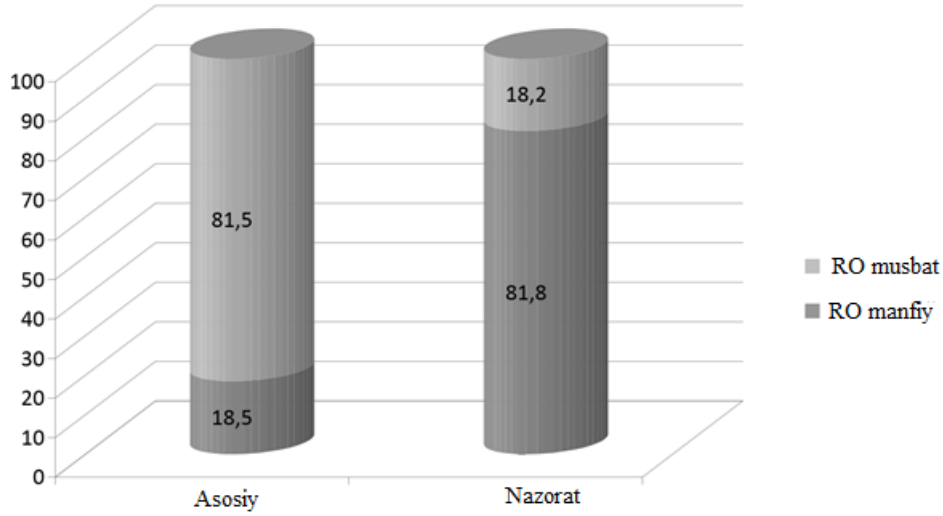
Bu ko‘rsatgichlar kasallikda bo‘g‘imlarning funksional yetishmovchiligi darajasi MOB shikastlanishiga ta’siri kamligini ko‘rsatadi (5 - va 6 - diagrammalar).

RA ning faolligini MOB ga ta’sirini aniqlash uchun ham yana raqamlarga murojaat etdik. Yuqoridaaytilganidek, bemorlarda I darajali faollik kuzatilmadi. Asosiy guruhdagi bemorlarning 20 tasida II darajali (74%), 7 tasida III darajali (26%) faollik darajalari aniqlandi. Nazorat guruhida barcha bemorlarda II darajali faollik aniqlandi. Bu jarayonning faollashuvi oshishi MOB ga ta’sir etadi (7-diagramma).



7. RA faollik darajalarining MOB ga ta’siri

Revmatoid omil asosiy guruhda 22 ta bemorda (81,5%) aniqlangan, 5 ta bemorda (18,5%) bo‘lmagan. Nazorat guruhida 2 ta bemorda (18,2%) aniqlangan, 9 ta bemorda (81,8%) reaksiya manfiy natija bergan. Bu ko‘rcatgichlar adabiyotlardagi ma’lumotlarni yana bir bor tasdiqladi (8-diagramma).



8. Revmatoid omilning MOB ga ta’siri.

Tayanch-harakat tizimini tahlil qilganda, RA va OA kasalliklarida MOB shikastlanishi yallig‘lanish jarayonida shikastlangan bo‘g‘imlar soni, bo‘g‘imlardagi funksional yetishmovchilik bilan bog‘liqligi yo‘qligi aniqlandi. Bo‘g‘imlardagi

o‘zgarishlarning chuqurligi, yallig‘lanish jarayonining faollashuvi esa ta’sir ko‘rsatishi ma’lum bo‘ldi. Bo‘g‘imlarida I -bosqichdagi rentgenologik o‘zgarishlar bo‘lgan bemorlarda MOB shikastlanish belgilari yo‘q, chuqurroq bo‘g‘im o‘zgarishlari bo‘lgan bemorlarda MOB shikastlanish alomatlari bor. RA kasaligida bo‘g‘imlarida III – va IV – bosqichli rentgenologik o‘zgarishlar bo‘lgan bemorlarning barchasida MOB shikastlangan. OA li bemorlarda jarayonni solishtirganda MOB shikastlanishi bo‘g‘im shikastlanishining III-bosqichida bo‘lgan bemorlarda II – bosqichli bemorlarga qaraganda ko‘proq.

RA ning faolligining III darajasi MOB shikastlanlangan bemorlarda bor, MOB shikastlanmagan bemorlarning barchasida II darajali faollik kuzatildi. Bundan kasallikning faolligining oshishi MOB ta’sir etishini bildiradi.

Adabiyotlar.

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SHAMOL EROZIYASIGA QARSHI YANGI IHOTA DARAXTZORLARINI BARPO ETISH

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Annotatsiya. *Qashqadaryo viloyatining qadimdan sug‘oriladigan, taqirsimon tuproqlarida yangi ihotazorlar tashkil etish, g‘o‘za, kuzgi bug‘doy va takroriy ekin sifatida soya o‘simligining oziq-ovqat xavfsizligida tutgan o‘rni va uning jozibadorligi.*

Kalit so‘zlar: *Tuproq, kuchli shamollar, yengil tuproq, qum zarrachalari, g‘o‘za, soya o‘simligi, agroximikatlar, kuzgi bug‘doy, takroriy ekin, taqir tuproq.*

Annotation: *The role of cotton, winter wheat and soybean as a repeat crop in the food security and its attractiveness, establishment of new hedgerows in the anciently irrigated, barren soils of Kashkadarya region.*

Keywords: *Soil, strong winds, light soil, sand particles, cotton, soybeans, agrochemicals, winter wheat, repeated cropping, barren soil.*

O‘zbekiston Respublikasining sug‘orma dehqonchilik bilan shug‘ullaniladigan hududlarida tuproq va ekinlar tezligi kuchli deflyatsiya jarayonlaridan (> 15 m/s) sezilarli darajada zarar ko‘radilar. Tezligi kuchli shamollar paytida, mexanik tarkibi yengil tuproqlar harakatga kelib, chang bo‘ronlarni keltirib chiqarishi natijasida tuproqlarning eng unumdor qismlari chang holatida o‘choqlardan uchib ketadi, qum zarrachalari esa goho havoga ko‘tarilib, goho yerga tushib, tuproq ustidagi zarrachalarni qo‘zg‘atib, havoga ko‘taradi, ular o‘z navbatida ekinlar bargini teshib, o‘sish nuqtasini kesib ketadi, bu holatda, ko‘pincha g‘o‘zani qayta yoki qisman qayta ekishga to‘g‘ri kelib, ekin hosili kech pishadi, uning sifati buziladi, qayta ekish uchun ko‘p urug‘, yonilg‘i, moylash mahsulotlari, agroximikatlar sarflanadi, katta iqtisodiy zarar yetkazadi va tuproq bilan agroximikatlar havoga ko‘tarilib, atrof muhitni zararlaydilar, shuning uchun ham shamol eroziyasiga qarshi kurash qishloq xo‘jaligida iqtisodiyotni va ekologik ahamiyat kasb etadi.

Qashqadaryo viloyatining Qarshi va Koson tumanlaridagi, kuchli shamol zonasi och tusli bo‘z va taqirsimon tuproqlar hududida shamol eroziyasiga qarshi yangi ihota daraxtzorlarini barpo etish orqali g‘o‘za, kuzgi bug‘doy hamda takroriy soyaning agrotexnik choralarini ahamiyati to‘g‘risida ilmiy tadqiqot ishlari olib borilmagan va ushbu ishlarni amalga oshirish bugungi kunning dolzarb muammolaridan biri hisoblanadi.

Janubiy xududning shamol eroziyasiga qarshi kurashda yangi ixotazorlarni barpo qilish orqali toboro oshib borayotgan suv tanqisligining salbiy oqibatlarini kamaytirish, daryo suvlarini iqtisod qilishga yangidan ilmiy yondashib, Qashqadaryo viloyatining taqirsimon tuproqlari sharoitida g‘o‘za, kuzgi bug‘doy va takroriy soyani sug‘orish taritiblarini qo‘llash, uning tuproqni suv-fizik xossalariga, suvdan samarali foydalanish, atrof muhitni muhofazalash hamda g‘o‘za, kuzgi bug‘doy va takroriy soyaning o‘sishi, rivojlanishi, paxta va don hosildorligiga ta’sirini aniqlashdan iboratdir.

Yillar davomida muttasil sug‘orma dehqonchilikda g‘o‘za, kuzgi bug‘doy va boshqa qishloq xo‘jaligi ekinlarini shamol va irrigasiya eroziyasiga moyil bo‘lgan tuproqlar sharoitida sug‘orish texnologiyasi elementlarini modelashtirish keng ko‘lamli ishlar amalga oshirilmoqda. Yerlarning meliorativ holatiga ta’sirini o‘rganish bo‘yicha respublikamizda Q.M.Mirzajonov, N.F.Bespalov, G.A.Ibragimov, SH.N.Nurmatov, M.X.Xamidov, B.F.Kambarov, K.M.Beysenboyev, L.A.G‘ofurova, D.D.Umarova, S.B.Bo‘riyev, N.E.Malaboyev, T.Rajabov, M.Mahmudov A.Abdukarimov, S.Isayev, I.Xoshimov va xorijda D.Balla, S.Maasen, J.Andersson, B.Wedding, K.Tonderski, K.M.Keinzler, A.S.Qureshi, M.Qadir kabi olimlar va boshqalar tomonidan keng qamrovli ilmiy tadqiqotlar olib borilgan.

Tadqiqot natijalarining ilmiy ahamiyati kuchli shamol eroziyasi tarqalgan xududlarida yangi ihotazorlarni barpo etish orqali toboro oshib borayotgan suv tanqisligining salbiy oqibatlarini kamaytirish, daryo suvlarini iqtisod qilishga yangidan ilmiy yondashib, Qashqadaryo viloyatining och tusli bo‘z va taqirsimon tuproqlari sharoitida g‘o‘za, kuzgi bug‘doy va takroriy soyani sug‘orish tartiblarini ishlab chiqish hamda uning tuproqning suv-fizik xossalariga, g‘o‘za, kuzgi bug‘doy va takroriy soyaning o‘sishi, rivojlanishi va hosildorligiga ta’sirini aniqlashdir.

Qashqadaryo viloyatining qadimdan sug‘oriladigan, taqirsimon tuproqlarida yangi ihotazorlar tashkil etish, g‘o‘za, kuzgi bug‘doy va takroriy ekin sifatida soya o‘simligini ekish maqsadga muvofiqdir .

Janubiy xududlarda ko‘proq shamol eroziyasiga qarshi kurashda yangi ihota daraxtzorlarini tashkil etish, g‘o‘za, kuzgi bug‘doy va takroriy soyani sug‘orish tartiblari, sug‘orish soni, mavsumiy sug‘orish meyori, suv istemoli, g‘o‘za, kuzgi

bug‘doy va takroriy soyaning o‘sishi, rivojlanishi, paxta va donning hosildorligi oshganligi kuzatiladi.

Ilmiy tadqiqotlar laboratoriya va dala tajribalarini o‘tkazish, fenologik kuzatish va biometrik o‘lchashlar “Metodika Gosudarstvennogo sortoispitaniya selskoxozyaystvennix kultur”, “Dala tajribalarni o‘tkazish uslublari” (O‘zPITI) asosida olib boriladi. Soya hosili ma’lumotlari B.A.Dospexovning “Metodika polevogo opita” manbasidagi dispersion tahlil uslubi hamda kompyuter dasturi yordamida matematik-statistik tahlil qilish uslubiy qo‘llanmalariga rioya qilingan holda o‘tkaziladi.

Qishloq xo‘jaligi ekinlaridan yuqori hosil olish, sug‘oriladigan yerlardan samarali foydalanish, global iqlim o‘zgarishlari kuzatilayotgan sharoitda mavjud suv manbalaridan oqilona foydalangan holda ekologik toza mahsulot yetishtirish bugungi kunning dolzarb talablaridan hisoblanib buning uchun ekinlarning talabiga mos ravishda sug‘orish usuli va tartibini qo‘llash talab etiladi.

Ta’kidlash joizki, inson organizmi maromida faoliyat ko‘rsatishi uchun oqsilga talab bir kunda uning vaznining har bir kilogrammi uchun 0,7 gr dan kam bo‘lmasligi lozim. Keyingi yillarda oziq-ovqat maxsulotlari va chorva uchun yem ishlab chiqarishning jadallashishi soya doni yetishtirishni ko‘paytirishni taqozo etmokda.

Soyadan ishlab chiqariladigan asosiy mahsulotlar - bu soya uni va soya moyidir. Soya uni qandolatchilik mahsulotlari, to‘ldiruvchilar, go‘sht, sut, pishloq o‘rnini bosuvchi mahsulotlar ishlab chiqarishda qo‘llaniladi. Moyi esa oziq-ovqatda, mayonez, margarin ishlab chiqarishda ishlatiladi. Ko‘pgina olimlar va ishlab chiqaruvchilar “soya - oziq-ovqat, yem-xashak va kelajak” deyishadi. Soya yordamida to‘la qimmatli o‘simlik oqsili ishlab chiqarish muammosi hal etiladi. So‘ngi yillarda soya yetishtiriladigan maydonlar keskin ko‘paydi, natijada soya ekinini asosiy maydonlarda yetishtirish, uning agrotexnikasi, sug‘orish usuli va sug‘orish tartibi bo‘yicha ilmiy izlanishlarni olib borishni talab yetadi.

Tuproqning granulometrik mexanik tarkibi. Tuproqning tuzilishi va tarkibi.
Tuproqning texnologik xossalari.
Tuproqning suvga chidamlilik mikro va mikroagregatlar tarkibi.
Tuproqni cheklangan dala nam sig‘imini aniqlash (CHDNS).
Tuproqni suv o‘tkazuvchanligini aniqlash
Tuproqni hajm massasi, solishtirma vazni va g‘ovaklik darajasi.
Tuproqni mikroagregatlar va granulometrik tarkiblari.
Tuproqni agrokimyoviy tavsifi (chirindi, SO_2, N, P,N-NO_3, P_2O_5, K_2O)
Tuproqni kalloid-il zarrachalarining guruxiy tarkibi.

Xulosa. Shamol eroziyasi jarayonlari, ularning tarqalgan hududlari, salbiy oqibatlari va ularga qarshi kurash bo‘yicha Respublikamizda va xorijda o‘tkazilgan ilmiy- tadqiqot ishlarining sharxi:

1. Tadqiqot obekti va o‘tkazish uslublari.
2. Dalani himoyalovchi, ixota daraxtzorlari polosalarining shamol eroziyasi jarayonlari, g‘o‘zaning o‘sishi, rivojlanishi va hosildorligiga ta’siri.
3. Kuzgi bug‘doydan turli kenglikda qilingan kulis to‘siqlarining degradatsiya jarayonlari va g‘o‘zani o‘sishi, rivojlanishi hamda hosildorlikka ta’siri.
4. Tez va baland o‘suvchi qishloq xo‘jalik ekinlaridan barpo qilingan kulis to‘siqlarining degredatsiya jarayonlariga , g‘o‘zaning o‘sishi, rivojlanishi va hosildorligiga ta’siri.
5. Iqlimning global isishi va suv tanqisligi sharoitida Qashqadaryo viloyatining sug‘oriladigan och tusli bo‘z va taqirsimon tuproqlari sharoitida degradasiyaga qarshi kurashda kulislardan foydalangan holda g‘o‘zaning “Buxoro-6”, “Buxoro-102”, kuzgi bug‘doyning “Ulug‘bek”, “Krasnadarskaya-99”, soyaning “Nafis” va “Uzbekskaya-6” navlaridan yuqori va sifatli paxta va don hosilini olish uchun egatlab va egat oralatib sug‘orish soni, sug‘orish muddati va meyorlari ishlab chiqilgan.
6. G‘o‘za navlarini CHDNSga nisbatan 70-70-70% tartibda egatlab sug‘orilganda tuproq hajm massasi amal davri oxirida 0-30, 0-50, 0-70, 0-100 sm qatlamlarda tegishlicha 0,04-0,04-0,05-0,05 g/sm^3 oshgan bo‘lsa, CHDNSga nisbatan 75-75-75% tartibda egat oralatib sug‘orilganda esa 0,03-0,03-0,04 g/sm^3 ga kamroq zichlangan holda suv o‘tkazuvchanlik egatlab sug‘orishda 789,2 m^3/ga, tegat oralatib sug‘orishda 900,4 m^3/ga ni tashkil etganligi aniqlangan.
7. Kuzgi bug‘doyning Krasnadarskaya-99 navini egat oralatib sug‘orish, kulislar bilan himoyalangan dalaning 3-variantda nazoratga nisbatan 6,2 s/ga ni, shunday kuzgi bug‘doyni egat oralatib sug‘orish, kulislar bilan himoyalangan dala 4-variantida nazoratga nisbatan 4,9 s/ga yuqoriligi kuzatilganligi aniqlangan.
8. Soyaning Uzbekskaya-6 navini egat oralatib sug‘orish, kulislar bilan himoyalangan dalaning 3-variantda nazoratga nisbatan 6,3 s/ga ni, shunday soyani egat oralatib sug‘orish, kulislar bilan himoyalangan dala 4-variantida nazoratga nisbatan 5,0 s/ga yuqoriligi kuzatilganligi aniqlangan.
9. Qashqadaryo viloyatining sug‘oriladigan och tusli bo‘z va taqirsimon tuproqlari sharoitida g‘o‘zaning Buxoro-6”, “Buxoro-102”, kuzgi bug‘doyning “Ulug‘bek”, “Krasnadarskaya-99”, soyaning “Nafis” va

"Uzbekskaya-6" navlaridan yuqori va sifatli paxta va don hosili yetishtirish uchun quyi dagilarga e'tibor qaratiladi.

G'o'zaning Buxoro-102 navini egat oralatib sug'orishda sug'orish oldi tuproq namligi CHDNS ga nisbatan 70-70-70% tartibda, 1-4-1 tizimda, 700-750 m^3/ga sug'orish meyorida 6 marta sug'orish, mavsumiy sug'orish meyori 4200 m^3/ga bo'lishi;

- kuzgi bug'doyning Krasnadarskaya-99 navini egat oralatib sug'orishda sug'orish oldi tuproq namligi CHDNS ga nisbatan 75-75-75% tartibda, 1-4-1 tizimda, 700-750 m^3/ga sug'orish meyorida 6 marta sug'orish, mavsumiy sug'orish meyori 4200 m^3/ga bo'lishi;

- soyaning Uzbekskaya-6 navini egat oralatib sug'orishda sug'orish oldi tuproq namligi CHDNS ga nisbatan 70-70-70% tartibda, 1-4-1 tizimda, 700-750 m^3/ga sug'orish meyorida 6 marta sug'orish, mavsumiy sug'orish meyori 4200 m^3/ga bo'lishi tavsiya etiladi.

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REVMATOID ARTRITNI DAVOLASH, NOSTEROID YALLIG‘LANISHGA QARSHI PREPARATLAR

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ANNOTASIYA

Maqolada revmatoid artrit kasalligining kelib chiqish sabablari, qon tahlilllari, epidemiologiyasi, etiologiyasi, genetik (irsiy) moyilligi, tashxisi va davolash usullari haqida fikr yuritilgan. Kasallik irsiy moyilligi bo‘lgan shaxslarda immun tizimining buzilishiga olib keladigan infektsiya natijasida rivojlanashi haqida fikrlar keltirilgan.

***Kalit so‘zlar**: Revmatoid artrit, leykotsit, eritrosit, autoimmune, Gipotermiya, giperinsolyatsiya,*

ЛЕЧЕНИЕ РЕВМАТОИДНОГО АРТРИТА, НЕСТЕРОИДНЫЕ ПРОТИВОВОСПАЛИТЕЛЬНЫЕ ПРЕПАРАТЫ

АННОТАЦИЯ

В статье рассматриваются причины ревматоидного артрита, анализы крови, эпидемиология, этиология, генетическая (наследственная) предрасположенность, диагностика и лечение. Были высказаны предположения, что заболевание развивается в результате инфекции, вызывающей нарушение иммунной системы у лиц с наследственной предрасположенностью.

***Ключевые слова**: ревматоидный артрит, лейкоциты, эритроциты, аутоиммунные заболевания, переохлаждение, гиперинсоляция.*

Revmatoid artrit — murakkab autoimmun patogenezli noaniq etiologiyali eroziv-destruktiv poliartrit tipi bo‘yicha asosan kichik bo‘g‘imlarning shikastlanishi bilan kechadigan biriktiruvchi to‘qimalarning tizimli kasalligidir. Bugungi kunda kasallikning rivojlanishi sabablari noma’lum. Bilvosita ma’lumotlar: qonda leykotsitlar sonining va eritrositlar cho‘kish tezligining (ECHT) ortishi — jarayonning infektsion tabiatli ekanligiga ishora qiladi. Taxmin qilinishicha, kasallik irsiy moyilligi bo‘lgan shaxslarda immun tizimining buzilishiga olib keladigan infektsiya natijasida rivojlanadi; bunda to‘qimalarda saqlanadigan va bo‘g‘imlarning zararlanishiga olib keladigan immun komplekslari (antitanalar, viruslardan va boshqalardan iborat) hosil bo‘ladi. Ammo revmatoid artritni antibiotiklar bilan davolashning samarasizligi, ehtimol, bu taxminning noto‘g‘riligidan dalolat beradi.

Kasallik juda erta sodir bo‘ladigan yuqori nogironlik (70%) bilan ajralib turadi. Kasallik tufayli o‘limning asosiy sabablari infektsion asoratlar va buyrak yetishmovchiligi hisoblanadi.

Revmatoid artritni davolash asosan og‘riqni yengillashtirish, kasallikning rivojlanishini sekinlashtirish va jarrohlik aralashuvi yordamida zararlangan to‘qimalarni tiklashga qaratilgan. Zamonaviy vositalar yordamida kasallik erta aniqlansa, uning bo‘g‘imlar va boshqa to‘qimalarga yetkazishi mumkin bo‘lgan zarari sezilarli darajada kamayadi.

Kasallik birinchi marta o‘zini og‘ir jismoniy zo‘riqish, hissiy shok, charchoq, gormonal moslashuv paytida, noxush omillar yoki infektsiyaning ta’siri natijasida namoyon qiladi.

Epidemiologiya

Revmatoid artrit butun dunyoda tarqalgan bo‘lib, barcha etnik guruhlarga ta’sir ko‘rsatadi. Tarqalganligi 0.5-1% (keksalarda 5% gacha). Har yili 100 000 aholidan 5-50 tasi kasallikka yo‘liqadi. 2010 yilda 49 mingga yaqin odam revmatoid artritdan vafot etgan.

Kasallik boshlanadigan o‘rtacha yosh ayollar uchun 40-50 yoshni tashkil qiladi, erkaklar uchun esa biroz ko‘proq. Ushbu kasallikka ayollar erkaklarga qaraganda 3-5 marta ko‘proq chalinishadi.

Etiologiya

Autoimmun kasalliklarning ko‘pchiligida bo‘lgani kabi, revmatoid artrit rivojlanishida uchta asosiy omilni (revmatologik triada) arjatib ko‘rsatish mumkin:

Genetik (irsiy) moyillik

- Autoimmun reaktsiyalariga irsiy moyillik.
- MHC II sinfining ma’lum bir antigeni: HLA-DR1, DR4 tashuvchilarida ko‘proq kuzatiladi

Infektsion omil: Revmatik kasalliklarning gipotetik triggerlari

- Paramiksoviruslar — parotit, qizamiq, respirator-sintsitsial infektsiyalar, viruslar;
- Gepatoviruslar — gepatit B virusi;
- Gerpresviruslar — oddiy gerpes viruslari, o‘rab oluvchi lishay, sitomegalovirus;
- Epshteyn-Barr virusi;
- Retroviruslar — T-limfotrop virus.

Boshlovchi omillar

- Gipotermiya, giperinsolyatsiya, zaharlanishlar, mutagen dorilar, endokrinopatiyalar, stresslar va boshqalar.

Ayollarda emizish davomiyligi revmatoid artrit rivojlanish ehtimolini pasaytiradi. 24 oy va undan ko‘proq vaqt davomida emizish RA rivojlanishining xavfini ikki martaga kamaytiradi.

Tashxis

Qonni tahlil qilayotganda ECHT, revmatoid omil (revmo-faktor), trombotsitlar soni va boshqalar tekshiriladi. Eng ilg‘or tahlillar antitanalarning sitrulin-saqlovchi siklik peptidga titri, anti-CCP hisoblanadi. Ushbu indikatorning o‘ziga xosligi taxminan 90% ni tashkil etadi, shu bilan birga u revmatoid artrit bilan xastalangan bemorlar zardobining 79% ida bo‘ladi.

Diagnostik jihatdan muhim klinik xususiyatlar — yallig‘langan bo‘g‘imlar sirtidagi teri rangining o‘zgarishlari yo‘qligi, qo‘l barmoqlari bukuvchi yoki yozuvchilarining tendonsinovitlari rivojlanishi va amiotrofiyalar, tipik kaft deformatsiyalari («revmatoid bilak») shakllanishi.

Infektsiya mavjud bo‘lganda yoki unga shubha qilinganda (sil, iersinioz va hokazo) tegishli antibakterial preparat bilan terapiya kerak bo‘ladi. Bo‘g‘imlardan tashqari yorqin ko‘rinishlar bo‘lmaganda (masalan yuqori isitma, Felti sindromi yoki polinevropatiya) artikulyar sindromni davolash nosteroid yallig‘lanishga qarshi preparatlarni (NYQP) tanlash bilan boshlanadi. Bir vaqtning o‘zida eng ko‘p yallig‘langan bo‘g‘imlarga kortikosteroidlar kiritiladi. Kasallikning immunokompleks tabiati plazmaferez kurslarining o‘tkazilishiga ko‘rsatma beradi va bu aksariyat hollarda sezilarli ta’sir ko‘rsatadi. Ushbu terapiya natijalarining beqarorligi bazisli vositalarni qo‘shilishiga ko‘rsatma bo‘lib hisoblanadi. Ushbu dori-darmonlar sekin ta’sir ko‘rsatadi, shuning uchun kamida 6 oy davomida qo‘llanilishi kerak, agar terapiya ijobiy ta’sir ko‘rsatsa, ular bilan davolanish yana davom ettiriladi (yillab).

Revmatoid artritni davolashda osteoporoz profilaktikasi — ichakda so‘rilishini oshirish va uning organizmdan chiqib ketishini kamaytirish yo‘li orqali buzilgan kaltsiy muvozanatini tiklash muhim o‘rin tutadi. Osteoporozga qarshi chora-tadbirlarning muhim tarkibiy qismi o‘zida ko‘p miqdorda kaltsiy saqlagan parhez hisoblanadi. Kaltsiy manbalari sut mahsulotlari (ayniqsa qattiq pishloqlar, ularning

100g miqdorida 600-1000mg kaltsiy bo‘ladi, shuningdek eritilgan pishloqlar; kamroq miqdorda kaltsiy tvorog, sut va smetanada mavjud), bodom, o‘rmon yong‘oqlari va yong‘oq, shuningdek vitamin D yoki uning faol metabolitlari bilan birgalikda kaltsiy preparatlari sanaladi.

Davolashda bo‘g‘imlarning maksimal harakatchanligini ta’minlash va mushak massasini saqlab qolish uchun mo‘ljallangan terapevtik mashqlar muhim ahamiyatga ega.

Fizioterapevtik muolajalar va sanatoriya-kurortli davolash ikkilamchi ahamiyatga ega va faqat artrit jiddiyligi yuqori bo‘lmaganida ishlatiladi.

Barqaror mono- va oligor artritda bo‘g‘imga oltin, ittriy va boshqalar izotopini kiritish orqali, yoki jarrohlik yo‘li bilan sinovektomiya amalga oshiriladi. Bo‘g‘imlarning barqaror deformatsiyalarida rekonstruktiv operatsiyalar o‘tkaziladi.

Tizimli medikamentoz terapiya to‘rt guruh preparatlarini qo‘llashni o‘z ichiga oladi:

1. Simptomatik davolash — nosteroid yallig‘lanishga qarshi preparatlar (NYQP) va glyukokortikosteroidlar (GKS),

2. Bazisli antirevmatik preparatlar,

3. Sitostatik immunosupressantlar bilan gen-muhandislik biologik (kasallik kechishini nazorat qiluvchi) preparatlar.

Zamonaviy NYQP’lar araxidon kislotasi metabolizmining asosiy fermenti bo‘lgan siklooksigenaza (SOG) faolligini bostirish orqali sezilarli yallig‘lanishga qarshi ta’sirga ega. SOG-1 va SOG-2 deb ta’riflangan va prostaglandinlar (PG) sintezini boshqarishda turlicha rol o‘ynaydigan ikkita SOG izoshakllarining kashf qilinishi alohida qiziqish taqdim etadi. NYQP’lar SOG izoshakllarining faolligini bostirishi isbotlangan, ammo ularning yallig‘lanishga qarshi faolligi aynan SOG-2 ingibitsiyasiga bog‘liq.

Ko‘pchilik mashhur NYQP’lar avvalo SOG-1 faolligini bostirishadi, bu bilan indutsiyalangan NYQP gastropatiya (xususan, eroziya va yaralar hosil bo‘lishi), buyrak funktsiyalarining buzilishi, ensefalopatiya, gepatotoksiklik kabi asoratlar tushuntiriladi.

Shunday qilib, SOG‘ni bloklash tabiatiga qarab, NYQP’lar SOG-2 ingibitorlari («koksiblar») va noselektivlarga bo‘linadi.

Nisbatan selektiv bo‘lgan SOG-2 ingibitorlari vakillari meloksikam, lornoksikam va «oksikam»larning boshqa vakillari va nimesulid hisoblanadi. Yuqori selektiv SOG-2 ingibitorlari vakillari selekoksib va etorikoksib sanaladi. Ushbu preparat oshqozon-ichak tizimi tomonidan minimal nojo‘ya ta’sirga ega va shu bilan birga yuqori yallig‘anishga qarshi va analgetik xususiyatlarini saqlab qolgan bo‘ladi. SOG-2 ingibitorlari barcha dasturlarida NYQP’lardan foydalanishni talab etadigan revmatoid

artritni davolashning barcha kurslarida qo‘llanilishi mumkin. Terapiyaning boshlanishida yallig‘lanish jarayonining faol bo‘lganida meloksikam sutkasiga 15 mg dozada buyuriladi va keyinchalik qo‘llab-quvvatlovchi terapiya sifatida sutkasiga 7,5 mg dozagacha tushiriladi. Nimesulid 100 mg dozada bir kunda ikki marta buyuriladi.

Selekoksib — SOG-2 ning maxsus ingibitori — sutkasiga ikki marta 100-200 mg‘dan dozada buyuriladi. Keksa kishilar uchun preparatning dozirovkasini tanlash talab qilinmaydi. Ammo tana vazni o‘rtacha ko‘rsatkichdan (50 kg) past bo‘lgan bemorlarda davolashni tavsiya etilgan eng kam dozadan boshlash tavsiya etiladi.

Ikki yoki undan ortiq NYQP’larning birgalikda qabul qilinishidan qochish kerak, chunki ularning samaradorligi o‘zgarishsiz qoladi, nojo‘ya ta’siri esa kuchayadi.

Biologik vositalar

Revmatoid artritda sinovial membranalar katta miqdorda glyukoza-6-fosfatdegidrogenaza fermentini chiqaradi, bu esa hujayra membranasidagi disulfid bog‘lamlarni buzadi. Bunda hujayra lizosomalaridagi fermentlarning «sizib chiqishi» kuzatiladi va ular yon atrofdagi suyak va tog‘aylarni shikastlaydi. Bunga javoban organizm sitokinlarni ishlab chiqaradi, ular orasida eng taniqlisi o‘sma nekrozi omili (O‘NO) hisoblanadi. Sitokinlar tomonidan boshlab yuboriladigan hujayralardagi reaktsiyalar kaskadi kasallikning alomatlarini yanada kuchaytiradi. O‘NO bilan bog‘liq surunkali revmatoid yallig‘lanish ko‘pincha mehnatga layoqatsizlik va jismoniy nuqsonlarga olib keladigan bo‘g‘imlar va tog‘aylar shikastlanishiga sabab bo‘ladi.

Prognoz

Revmatoid artrit umr davomiyligini o‘rtacha 3-12 yilgacha qisqartiradi. 2005-yilda Mayo Klinikasi tomonidan o‘tkazilgan tadqiqot revmatoid artritdan aziyat chekadigan bemorlarda boshqa xavf omillaridan qat’iy nazar (chekish, qandli diabet, alkogolizm, semizlik va yuqori xolesterin miqdori kabi), yurak kasalliklari rivojlanishi xavfi ikki barobar yuqori ekanligini ko‘rsatdi. Yurak kasalliklari rivojlanishi xavfini oshiruvchi mexanizm noma’lum; surunkali yallig‘lanish mavjudligi muhim omil hisoblanadi. Ehtimol, yangi biologik vositalardan foydalanish hayot davomiyligini uzaytiradi va yurak-qon tomir tizimi uchun xavfni kamaytiradi hamda ateroskleroz rivojlanishini sekinlashtiradi.

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GIDROTEXNIKA INSHOOTLARDAGI AVARIYALAR VA ULARGA QO‘YILADIGAN TALABLAR (SARDOBA MISOLIDA)

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ANNOTATSIYA

Ushbu maqolada gidrotexnik inshootlarda sodir bo‘lishi mumkin bo‘lgan favqulodda vaziyatlar hamda ularning oldini olish, bartaraf etish yo‘llari, gidrotexnik inshootlarining xavfsizligi hamda xavfsizlikni ta’minlashga qo‘yiladigan talablar ko‘rib chiqilgan. Bundan tashqari 2020-yil 1-may kunida Sirdaryo viloyati hududida joylashgan “Sardoba” suv omborida sodir bo‘lgan favqulodda vaziyat hamda ularni bartaraf etish tadbirlaridagi FVDTning harakatlari bundan tashqari amalga oshirilgan tadbirlar yoritilgan.

Kalit so‘zlar: *avariya, gidrotexnik inshoot, xavfsizlik, toshqin, talofat, texnogen.*

ABSTRACT

This article examines possible emergencies in hydroelectric facilities as well as ways to prevent, eliminate them, safety of hydroelectric facilities, and safety requirements. In addition, on may 1, 2020, the emergency situation in the “Sardoba” reservoir, located on the territory of the Syrdarya region, as well as the actions of the Fvdt in the measures to eliminate them, were covered.

Keywords: *accident, hydraulic structure, safety, flood, loophole, man-made.*

АННОТАЦИЯ

В данной статье рассматриваются возможные чрезвычайные ситуации на гидротехнических сооружениях, а также способы их предупреждения, ликвидации, безопасность гидротехнических сооружений и требования к обеспечению безопасности. Кроме того, освещены чрезвычайные ситуации, произошедшие 1 мая 2020 года на водохранилище “сардоба”, расположенном на территории Сырдарьинской области, а также действия Фвдт в мероприятиях по их ликвидации.

Ключевые слова: *авария, гидротехническое сооружение, безопасность, наводнение, жертва, техногенный.*

KIRISH

Texnogen tusdagi favqulodda vaziyatlarga 7 xil ko‘rinishidagi falokatlar kiradi, hamda bu falokatlar O‘zbekiston Respublikasi Vazirlar Mahkamasining 1998 yil 27 oktabrdagi 455-sonli qarorida “Texnogen, tabiiy va ekologik tusdagi favqulodda vaziyatlar tasnifi”da ko‘rsatib o‘tilgan. Bu falokatlardan biri gidrotexnik inshootdagi favaqulodda vaziyatdir. Gidrotexnika inshootlari-suv omborlari, to‘g‘onlari, daryolar, soylar, kanallar va kollektordagi to‘g‘onlar, daryolarning o ‘zanlarini to ‘suvchi inshootlar, suv oluvchi, suv o‘tkazuvchi, suv tashlash hamda qirg‘oqlarni himoya qilish inshootlari, gidroelektrostansiyalar, nasos stansiyalari. Gidrotexnika inshootlarining xavfsizligi-gidrotexnika inshootlarining fuqarolar hayoti, sog‘ligi va qonuniy manfaatlari, jismoniy hamda yuridik shaxslarning mol-mulki, atrof-muhit va xo‘jaligi obyektlari himoya qilinishini ta’minlash imkonini beruvchi holat.

ADABIYOTLAR TAHLILI VA METODLAR

O‘zbekiston Respublikasida hozirgi paytda 53 ta suv ombori, daryo suvlarini iste’molchilarga taqsimlab beruvchi 150 dan ortiq suv to‘g‘onlari, 28122 km uzunlikdagi magistral kanallar va boshqa suv inshootlari mavjud. Bunday inshootlar har qanday favqulodda vaziyatlar yuz berganda (harbiy holatda ham, tinchlik davrida ham) katta xavf tug‘diradi. Gidrotexnika inshootlarning ayrimlari katta shaharlar va yirik aholi yashash joylari yaqinida joylashgan bo‘lib, yuqori darajadagi xavfli obyektlar hisoblanadi. Gidrotexnik inshootlari, ko‘rsatkichlariga ko‘ra har xil bo‘ladi:

1) **joylashgan o‘rniga ko‘ra:**

a) yer usti inshootlari (daryo, ko‘l, kanal va h.k);

b) yer osti inshootlari (o‘tkazuvchi quvurlar, tunellar va h.k).

2) **foydalanish maqsadiga ko‘ra:**

a) suv-energetika inshootlari;

b) suv ta’minoti inshootlari;

v) sug‘orish inshootlari;

g) chiqindi suvlarni chiqarish inshootlari;

d) baliqchilik xo‘jalik inshootlari va hokazo.

3**) vazifasiga qarab:**

a) GES lar va boshqa suv inshootlari (to‘g‘onlar va boshqalar);

b) suv o‘tkazish inshootlari (kanallar, tunellar, quvur o‘tkazgichlar);

v) tarnovlar, osma quvurlar va h.k.;

g) tashlandiq suv inshootlari (ortiqcha suvni chiqarish uchun).

Gidrotexnik inshootlarning buzilishi juda kata hududlarni, jumladan: shaharlar va aholi yashash joylarni, sanoat tarmoqlarini va moddiy resurslarni suv ostida qolishiga olib kelishi mumkin, oqibatda juda katta ham ma’naviy, ham moddiy zararlarni olib kelishiga sabab bo‘ladi. Gidrotexnik inshootlari quyidagi ta’sirlar natijasida buziladi:

1) tabiiy ofatlar oqibatida (zilzila, ko‘chki, jala yomg‘irlar yuvib ketish va boshqalar);

2) uskunalarning tabiiy yemirilishi va eskirishi;

3) inshootni loyihalash va qurishdagi xatoliklar;

4) suvlarni ishlatish qoidalarini buzilishi;

5) portlatishlar oqibatida (harbiy harakatlar, terrorchilik va boshqalar).

1-rasm. Gidrotexnika inshootlari hududi chegarasida obyektlar qurish taqiqlandi.

Gidrotexnik inshootlarining buzilishi natijasida muayyan oqibatlarga olib keladi, jumladan:

-Gidrotexnik inshooti o‘z vazifasini bajarmay qo‘yishi;

- suv to‘lqinini insonlarga zarar yetkazishi va turli inshootlarni buzilishi;

-hududlarni suv bosib, mol-mulkka, yerlarga, moddiy resurslarga va boshqa obyektlarga jiddiy moddiy zarar keltiradi.

Shuning uchun bunday inshootlardan foydalanuvchi tashkilotlar zimmasiga ularning xavfsizligini ta’minlash maqsadida “Fuqaro muhofazasi to‘g‘risida”gi qonunining 8,9-moddalarida ko‘rsatib o‘tilgan majburiyatlar yuklab qo‘yilgan. Unga ko‘ra bunday xavfli obyektlarni loyihalash, qurish va ishlatish davomida xavfsizligini pasayish sabablarini tahlil etish, sodir bo‘lishi mumkin bo‘lgan avariyani oldini olish bo‘yicha chora-tadbirlarni ishlab chiqish va bajarish, shuningdek bunday masalalar bo‘yicha favqulodda vaziyatlar tizimlari bilan hamkorlik qilish ta’kidlangan.

MUHOKAMA VA NATIJALARLAR

Jahon statistikasini hisobga olsak, so‘nggi 100 yil ichida o‘rtacha 1900-yildan beri beton to‘g‘onlarning har yili vayron bo‘lish va shikastlanish xavfi, 0,34 10-4 va 0,45 10-3 ni tashkil qiladi, bundan tashqari yillik barcha turdagi to‘g‘onlarning avariyalari natijasida inson qurbonlarining global xavfi 5.1 10-8. Baxtsiz hodisalarda inson qurbonlari va moddiy yo‘qotishlar zamonaviy to‘g‘onlarni tabiiy ofatlar oqibatlari bilan solishtirish mumkin. 2020-yil vatanimiz hayoti uchun eng og‘irli hamda sinovli yil bo‘lgan. Ro‘y bergan tabiiy ofatlar, texnogen avariyalar va pandemiyalar Favqulodda vaziyatlar vazirligi hamda Favqulodda vaziyatlarda ularning oldini olish va bunday vaziyatlarda harakat qilish davlat tizimini real vaziyatda tezkor va samarali faoliyat ko‘rsatishni talab qildi. Jumladan, 1 may kuni “Sardoba suv ombori” to‘g‘onining (suv hajmi 922 mln.kub.m) 100 p/m uzunlikdagi qismi o‘pirilishi oqibatida Sirdaryo viloyatining Sardoba, Oqoltin va Mirzaobod tumanlaridagi 4 ming 700 ta aholi xonadonlari, 77 ta ko‘p qavatli uylar, 40 ta ijtimoiy soha obyektlari, 34 ming gektardan ziyod ekin maydonlari, 24 ta ko‘priklar, yuzlab kilometr uzunlikdagi yo‘llar infratuzilmasi hamda muhandislik-kommunikatsiya tarmoqlari suv toshqini ostida qolgan. Birlamchi hisob-kitoblarga ko‘ra, yetkazilgan zarar miqdori 1 trillion 500 mlrd. so‘mni tashkil qilgan. Sirdaryo viloyatida suv toshqini bilan bog‘liq favqulodda vaziyat oqibatlarini bartaraf etishga FVDT tarkibiga kiruvchi vazirlik va idoralarning 21 ming nafar shaxsiy tarkibi, 3 ming 700 dan ortiq texnika va 200 ta motopompasi (jumladan, FVVning 1 ming 500 nafar shahsiy tarkibi, 135 ta maxsus texnika,140 ta motopompa) jalb etilgan bo‘lib, Sirdaryo viloyatida kechiktirib bo‘lmas tadbirlar amalga oshirildi. Maxsus muhandislik-qurilish boshqarmasining shaxsiy tarkibi hamda avtotransport va maxsus texnikalari safarbar qilingan.

2-rasm. Sardoba suv ombori buzilishi.

Ichki ishlar, Mudofaa vazirliklari, Milliy gvardiya, FVDTga kiruvchi tashkilot va idoralar bilan olib borilgan tezkor harakatlar oqibatida 89 ming nafardan ortiq aholi xavfsiz hududlarga evakuatsiya qilingan, 12 ta qayiq yordamida 207 nafar, Mudofaa vazirligi aviatsiyasi yordamida 87 nafar fuqarolarning hayoti saqlab qolingan. Suv toshqini jarayonida Sirdaryo viloyati Favqulodda vaziyatlar boshqarmasida sutkalik ishlaydigan qisqa raqamli call markazi ishga tushirilgan bo‘lib, 8 ming 150 ta murojaatdan 8 ming 80 tasi ijobiy hal etilgan. O‘zbekiston Respublikasi Prezidentining farmoyishiga asosan, 6 aprel – 3 iyul kunlari Favqulodda vaziyatlar, Suv xo‘jaligi vazirliklari hamda Sirdaryo viloyati hokimligining 270 nafar shaxsiy tarkibi va 170 ta texnikasi, 100 dona motopompa yordamida Qozog‘iston Respublikasi Turkiston oblasti Jettisoy va Maqtaral tumanlarining Argibas, Firdavsiy hududidagi toshqin suvlaridan zarar ko‘rgan aholi punktlarida avariya-tiklash ishlarini olib borilgan.

3-rasm. Sardoba suv ombori orqali vujudga kelgan vayronagarchilik.

Gidrotexnik inshootlaridagi avariyalarda fuqarolarning xatti-harakatlari:

1) Suv ostida qoladigan hududdagi fuqarolarni, suv bosishi mumkin bo‘lgan hududlarni va suv bosish vaqtini shuningdek shikastlovchi omillarini (suv urib ketadigan to‘lqin balandligi va tezligini va boshqalarni) yaxshi bilishlari kerak;

2) Aholining hammasi suv bosish xavfi tug‘ilgandagi va suv bosgandagi xatti-hara - katlarga tayyorlangan bo‘lishlari kerak;

3) Aholining hammasi suv bosish ehtimoli borligi, suv bosish vaqti, uning chegaralari haqidagi va evakuatsiya tartibi haqidagi tavsiyalarni vaqtida olishi kerak;

4) Xavf haqidagi xabar (ogohlantirish) olinganda quyidagi ishlar qilinishi kerak:

- darhol hujjatlarni, qimmatbaho va kerakli buyumlarni, 2-3 kunlik oziq-ovqat va ichimlik suvini o‘zi bilan olish;

- uylarni ehtiyot holatda (gaz, suv, elektr ta’minotini o‘chirishi) qoldirishi kerak;

- chorva mollarini xavfsiz joylarga o‘tkazib qo‘yish;

5) Agar to‘satdan halokatli suv bossa:

- suvning to‘lqin zarbidan saqlanish uchun mustahkam qurilgan inshootlarning yuqori qismlariga chiqiladi;

- oldindan tayyorlangan qutqaruv vositasini (4-6 ta bir litrli plastmassa idishlari osilgan najot kamarini) taqib olishadi;

- agar odam imorat ichida (yuqori qismlarida) qolgan bo‘lsa, qayerdaligini belgilab, qutqaruvchilar yordamga kelishi uchun oq bayroq belgilari osib qo‘yiladi.

XULOSA

Gidrotexnika inshootlarining xavfsiz va samarali ishlashini ta’minlash uchun avariyalarni oldini olish, yaxshilash va xavfsiz ekspluatatsiyani ta’minlash juda muhim hisoblanadi. Shuningdek, har qanday avariyani bartaraf etish uchun ilg‘or texno-logiyalar yaratish va malakali mutaxassislar o‘qitish lozim. Gidrotexnika inshootlarining muvaffaqiyatli ishlashi uchun nafaqat iqtisodiy jihatdan, balki ekologik hamda ijtimoiy jihatdan ham ahamiyatli hisoblanadi.

FOYDALANILGAN ADABIYOTLAR

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POPULARIZING THE USE OF UNMANNED AERIAL VEHICLES IN AGRICULTURE IN UZBEKISTAN

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ABSTRACT

The integration of Unmanned Aerial Vehicles (UAVs) into agriculture represents a transformative opportunity for Uzbekistan, a nation where agriculture plays a critical role in the economy and rural livelihoods. This paper explores the potential of UAVs to address pressing agricultural challenges, such as optimizing water usage, improving crop monitoring, and enhancing yield productivity. The study examines current UAV adoption trends, identifies barriers to widespread implementation, and evaluates the economic and environmental benefits. By leveraging UAV technology for precision agriculture, Uzbekistan can improve resource efficiency, reduce labor costs, and promote sustainable farming practices. This research emphasizes the need for government support, affordable access to UAVs, and farmer education programs to popularize UAV usage. Recommendations are provided for policy frameworks and strategies to accelerate the adoption of UAVs, ultimately contributing to the modernization and sustainability of Uzbekistan's agricultural sector.

Keywords: *Unmanned Aerial Vehicles (UAVs), drones in agriculture, precision agriculture, agricultural technology, optimization, irrigation management, modern farming.*

Introduction

Agriculture is a cornerstone of Uzbekistan's economy, accounting for a significant share of the country's GDP and employing a large portion of its workforce. However, the sector faces numerous challenges, including inefficient resource utilization, outdated farming techniques, and the impacts of climate change. In recent years, technological advancements have emerged as critical tools for addressing these

challenges, with Unmanned Aerial Vehicles (UAVs) offering a promising solution for modernizing agricultural practices.[1]

UAVs, or drones, have revolutionized precision agriculture worldwide by enabling farmers to monitor crops, assess field conditions, optimize irrigation, and apply fertilizers and pesticides with pinpoint accuracy. Over the past 10-15 years, with high-end technology transformations from radio controlled model hobbyist's airplanes, drones are integrated with variety of functions(Vikram Puri, Anand Nayyar & Linesh Raja 2017). These innovations not only enhance productivity but also promote sustainability by reducing waste and conserving resources. For Uzbekistan, where efficient water management and improved crop yields are pressing concerns, the adoption of UAV technology could play a transformative role.[2]

Despite the potential benefits, the integration of UAVs in Uzbekistan's agricultural sector remains limited. High costs, a lack of awareness, insufficient technical expertise, and regulatory hurdles are key barriers to widespread adoption. This paper aims to explore the opportunities and challenges associated with popularizing UAV use in agriculture across Uzbekistan. By examining global best practices and tailoring solutions to the local context, this study seeks to provide actionable recommendations to foster the development of a modern, efficient, and sustainable agricultural industry in Uzbekistan.[3]

The Importance of Agriculture in Uzbekistan. Agriculture is a fundamental part of Uzbekistan's economy, contributing approximately 25% to the national GDP and providing employment for nearly half of the workforce, particularly in rural areas. The sector plays a vital role in the nation's economic stability, food security, and social development.

Cotton, often referred to as "white gold," has historically been a key export commodity for Uzbekistan, making it one of the world's largest producers and exporters of cotton. However, the country is shifting towards agricultural diversification, emphasizing the cultivation of grains, fruits, and vegetables to reduce dependence on cotton and enhance resilience in the face of global market fluctuations.[4]

In addition to export crops, agriculture in Uzbekistan ensures food security by producing essential staples such as wheat, fruits, and vegetables. The country is also known for its production of melons, apricots, and cherries, which contribute significantly to food exports and help stabilize domestic food prices.

The sector's reliance on irrigation due to Uzbekistan's arid climate presents a major challenge. Water scarcity, soil salinization, and inefficient water management practices threaten agricultural productivity. However, the government has prioritized investments in modernizing irrigation systems and adopting water-conserving technologies to ensure sustainable agricultural practices.

Agriculture also drives rural development, fostering job creation, infrastructure improvements, and higher living standards in rural areas. Investments in agricultural technologies, such as precision farming and drone monitoring, are improving productivity and efficiency, while also helping farmers manage resources more sustainably. The integration of modern agricultural techniques is crucial for maintaining the sector's growth and ensuring environmental sustainability.

Culturally, agriculture is deeply woven into the fabric of Uzbekistan's identity. Traditional farming practices, local festivals, and cuisine all reflect the strong connection to the land. Balancing innovation with the preservation of this agricultural heritage will be essential for the sustainable development of the sector.

In conclusion, agriculture remains vital to Uzbekistan's economy and society. While challenges such as water scarcity and outdated methods persist, ongoing efforts to diversify crops, modernize infrastructure, and implement sustainable practices will strengthen the sector's long-term viability. Agriculture's role in ensuring food security, providing livelihoods, and driving rural development will remain central to Uzbekistan's future growth.[5]

Unmanned Aerial Vehicles in Agriculture Currently, the practical applications for drones are expanding from hobbyists to industries and other areas like agriculture etc. Among several promising fields, agriculture is considered one of the most significant areas where diverse solutions with advanced features are essential to address various challenges faced by farmers and enhance crop yields. Below are the key applications and benefits of utilizing drones in agriculture, enabling efficient execution of daily farming tasks:

Drones are advanced, reliable tools that allow farmers to assess field conditions at the start of the cropping season. By generating 3D soil maps, drones assist in planning for seed plowing and provide valuable insights for irrigation and managing nitrogen levels, ultimately supporting better crop growth. This can help to reduce costs associated with over-fertilization, over-watering, and other inputs, while also increasing crop yields. Agriculture drones can help to save labor costs by reducing the need for manual intervention in farming operations. For example, drones can be used for crop monitoring, mapping, and analysis (Agriculture Drones Market, n.d.).[6,7]

Fig.1 Drone Agricultural Analysis

Additionally, drones can save time by delivering real-time insights into crop health and productivity. This enables farmers to make prompt decisions regarding irrigation, fertilization, and other agricultural activities. In summary, drones offer a cost-efficient solution for farmers aiming to enhance their operations and boost crop yields.

The precise application of pesticides, fertilizers, and water, guided by drone technology, contributes to increased agricultural productivity and improved crop quality. Drones can identify areas with pests and weeds with 95% accuracy, allowing farmers to treat only the targeted areas of their crops. Studies show that traditional methods (hand or tractor-driven) use 30% more pesticides and fertilizers than usual (Qodirov, S. X. 2024). Drones can analyze the condition of crops and soil, assess humidity levels and air temperature, and accurately calculate the amount of water needed for plants.

Some drones are equipped with pneumatic firing devices that can shoot seed pods directly into the soil. This eliminates the need for manual labor and speeds up the planting process. A report from Stanford University indicates that drone planting can be up to 5 times faster than traditional methods (Shawky, M. 2023) [8].

Fig.2 Drone-Based Seed Planting

In an environment where water is gold, the ability to optimize its use is invaluable. Drones enable what's known as "precision irrigation," ensuring that each plant receives the exact amount of water it needs. In Qatar, for instance, this has led to a staggering 30% reduction in water usage for agricultural practices (Shawky, M. 2023).

Crop Health Monitoring: Drones equipped with infrared, NDVI, and multispectral sensors enable farmers to monitor crop health effectively. These technologies provide insights into factors like transpiration rates, sunlight absorption, and overall plant vitality, facilitating timely interventions for improved yield.

Challenges and Opportunities in Integrating UAVs into Uzbekistan's Agricultural Sector. Despite the clear potential benefits of Unmanned Aerial Vehicles (UAVs) in revolutionizing Uzbekistan's agricultural practices, their widespread adoption remains limited. Several factors hinder the full integration of UAV technology into the country's agricultural sector, but with the right approach, these challenges can be overcome. By examining these barriers and understanding global best practices, the sector can move towards the successful incorporation of UAVs, leading to a more efficient, modern, and sustainable agricultural industry.

One of the most significant barriers to the adoption of UAVs in Uzbekistan's agricultural sector is the high initial investment required to purchase and maintain drone technology. Many farmers, particularly those in rural areas, may not have the financial resources to invest in advanced UAV systems. This is exacerbated by the costs associated with training personnel to operate the drones and manage the data they collect. For smallholder farmers, the return on investment might not seem immediate or guaranteed, which makes them hesitant to adopt these technologies.

However, as the global UAV market continues to expand, drone prices are expected to decrease over time. Additionally, government subsidies, grants, or partnerships with technology providers could help alleviate the financial burden for farmers, making UAVs more accessible to a wider population.

Another challenge is the limited awareness of UAV technology among farmers and agricultural professionals in Uzbekistan. Many in the sector may not be fully aware of the capabilities and advantages that drones can bring to agriculture. UAVs can assist with crop monitoring, precision spraying, soil analysis, irrigation management, and more. However, without sufficient knowledge about how drones can improve efficiency and yield, many farmers remain skeptical or unaware of the benefits.

To address this, education and awareness campaigns are crucial. These could include training workshops, demonstrations, and pilot programs that allow farmers to experience firsthand the advantages of UAVs. Collaboration with agricultural universities, research institutions, and international organizations could play a significant role in educating the next generation of farmers and agri-tech professionals.

The use of UAVs requires technical knowledge for both operation and data analysis. Farmers need training not only in flying drones but also in interpreting the data collected, such as multispectral imaging, crop health assessments, and field mapping. There is currently a shortage of skilled professionals who can provide such expertise in rural Uzbekistan, and this gap limits the effective integration of UAVs in the agriculture sector [9].

Building local technical capacity through specialized training programs and partnerships with technology providers can bridge this gap. Universities and technical institutes can collaborate with drone manufacturers to design curricula that cover drone operation, data interpretation, and maintenance. This would provide a steady supply of skilled labor for the sector, making drone adoption more feasible.

The regulatory environment for UAVs in Uzbekistan is still developing. Current laws and regulations related to drone use are not fully adapted to the specific needs of the agricultural sector. In many cases, complex licensing requirements, restricted airspace, and unclear legal frameworks can deter farmers from adopting UAV technology. Additionally, there is limited government support in terms of creating a regulatory framework that facilitates the widespread use of UAVs in agriculture.

To overcome this barrier, it is essential for the government to work closely with stakeholders in the agricultural, aviation, and technology sectors to establish clear and flexible drone regulations. These regulations should be tailored to the needs of farmers and should encourage innovation while ensuring safety. Simplified procedures for licensing, flight permissions, and airspace management can help expedite the adoption of UAVs in agriculture.

The effective use of drones in agriculture generates vast amounts of data that need to be processed, analyzed, and stored. This requires advanced data management systems and infrastructure, which may not be readily available in many parts of Uzbekistan. Farmers may struggle to manage and interpret complex datasets, particularly without the necessary tools and software.

One potential solution is the development of accessible, user-friendly platforms that help farmers analyze the data gathered by UAVs. Partnerships with technology companies can facilitate the creation of software that simplifies data processing and provides actionable insights. Additionally, improving internet connectivity in rural areas is essential for real-time data transmission and cloud-based data storage.

Globally, countries such as the United States, China, and Japan have successfully integrated UAVs into their agricultural sectors. These countries have leveraged drones for precision agriculture, improving crop yield, reducing waste, and optimizing resources like water and fertilizer. Uzbekistan can learn from these global best practices by adapting them to its unique agricultural environment.

For instance, pilot projects and case studies showcasing successful UAV applications in similar climates and agricultural conditions could provide valuable insights. Collaborating with international agencies and drone manufacturers who have experience in large-scale agricultural drone deployments can help identify cost-effective solutions and best practices that align with Uzbekistan's agricultural needs.

Despite the challenges, there are numerous opportunities for integrating UAVs into Uzbekistan's agricultural sector. Drones can help farmers optimize irrigation practices by providing real-time data on soil moisture levels, allowing for more efficient water use in a country where water scarcity is a major issue. UAVs can also help with the early detection of pests and diseases, which can reduce crop loss and minimize the use of harmful pesticides.

Furthermore, by enabling precision agriculture, UAVs can contribute to sustainable farming practices. Drones can help farmers apply fertilizers and pesticides more accurately, reducing environmental impact and lowering operational costs. The ability to monitor crops from the sky also provides farmers with valuable insights into crop health, helping them make informed decisions that improve yield and quality [10].

Conclusion.

In conclusion, while there are significant barriers to the widespread adoption of UAVs in Uzbekistan's agricultural sector, there are also considerable opportunities to integrate this technology into the farming industry. Overcoming challenges related to cost, awareness, technical expertise, and regulation will require a concerted effort from the government, agricultural professionals, and the technology sector. A crucial step in this process is the preparation of educated professionals by universities and technical institutions, which can play a key role in equipping the workforce with the necessary skills to operate and manage UAV technology effectively. By incorporating UAV-related courses and programs into agricultural and engineering curricula, universities can help foster a generation of skilled experts who can drive innovation in the sector. Furthermore, by leveraging global best practices and developing tailored solutions, Uzbekistan can unlock the full potential of UAVs, transforming its agricultural industry into a more modern, efficient, and sustainable sector.

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REVMATOID ARTRIT DIAGNOSTIKASI VA DAVOLASHNING AYRIM JIHATLARINI O‘RGANISH

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Ilmiy rahbarlar: Andijon davlat tibbiyot instituti
Oilaviy shifokorlar tayyorlash kafedrasi o‘qituvchilari

ANNOTATSIYA

Revmatoid artrit - hozirgi vaqtda bu kasallik nafaqat sog‘liqni saqlash tizimining, balki jahon hamjamiyatining ijtimoiy-iqtisodiy muammolaridan biriligicha qolmoqda. Misol uchun dunyo bo‘ylab 18 million inson revmatoid artrit bilan kasallangan.Birgina Buyuk Britaniyada har yili Revmatoid artritning 24 500 dan ortiq yangi holatlari aniqlanadi. 2029 - yilga borib yangi tashxis qo‘yilgan holatlar 25 400 dan ortishi kutilmoqda. 2000-2019 yillar oralig‘ida kasallanish soni 100 000 kishiga 58.4 dan 94,0 gacha ko‘tarilgan

Kalit so‘zlar: *Revmatoid artrit, ASSP, C- reaktiv oqsil, revmatoid faktor.*

STUDYING CERTAIN ASPECTS OF THE DIAGNOSIS AND TREATMENT OF RHEUMATOID ARTHRITIS

ABSTRACT

Rheumatoid arthritis remains not only a concern of the healthcare system but also one of the socio-economic issues of the global community. For example, around 18 million people worldwide suffer from rheumatoid arthritis. In the United Kingdom alone, more than 24,500 new cases of rheumatoid arthritis are diagnosed each year. By 2029, the number of newly diagnosed cases is expected to exceed 25,400. Between 2000 and 2019, the incidence rate rose from 58.4 to 94.0 per 100,000 people.

Keywords: *Rheumatoid arthritis, ACCP, C- reactive protein, rheumatoid factor.*

KIRISH.

Revmatoid artrit- murakkab autoimmun patogenezli noaniq etiologiyali eroziv-destruktiv poliartrit tipi bo‘yicha asosan kichik bo‘g‘imlarning shikastlanishi bilan kechadigan biriktiruvchi to‘qimalarning tizimli kasalligidir.Kasallik birinchi marta o‘zini og‘ir jismoniy zo‘riqish, hissiy shok, charchoq, gormonal moslashuv paytida, noxush omillar yoki infektsiyaning ta’siri natijasida namoyon qiladi.

ADABIYOTLAR TAHLILI VA METODOLOGIYA

Namangan viloyati Norin tuman tibbiyot birlashmasi ichki kasalliklar bo‘limlarida revmatoid artrit kasalligi tashxisi bilan ohirgi 12 oy davomida davolangan bemorning kasallik tarixlarini retrospektiv o’rganildi. O‘tkazilgan labarator klinik tekshiruvlar - umumiy qon analizi, qonning biokimyoviy tahlili, revmatoid faktor, C–reaktiv oqsil, ASSP analizlari tahlil qilindi. Olingan analiz natijalariga asosan Yevropa va Amerika revmatologlari tomonidan ishlab chiqilgan so‘nggi revmatoid artritni tasniflash mezonlari (EULAR/ACR 2023) asosida salbiy prognostik omillarni hisobga olgan holda, bo‘g‘imlardagi faol yallig‘lanish, ECHT va o‘tkir fazali oqsillar miqdorining ortishiga qarab bemorlar tasniflandi. Yangi mezon bo‘yicha tashxis qo‘yish uchun bemor kamida 10 balldan 6 ballga ega bo‘lishi kerak. Revmatoid artritni EULAR/ACR 2023 bo‘yicha tasniflash: Klinik belgilar (bo‘g‘imlarning shishi) 0-5 ball gacha, Immunologik ko‘rsatgichlar (RF, ASSP) 0-3 ball gacha, Yallig‘lanish ko‘rsatgichlari (ECHT, C - reaktiv oqsil) 0-1 ball gacha Sinovitning davomiyligi 0-1 ball gacha baholanadi.

NATIJALAR.

Yuqoridagi tasniflash asosida klinik belgilar (bo‘g‘imlarning shishi) ga ko‘ra o‘rganilgan bemorlarning 10 % bo‘g‘imlar zararlanmaganligi sababli 0 ball. 27 % bemor 1-3 ta kichik bo‘g‘imlar zararlanganligi sababli 2 ball. 33 % bemor 4-10 ta kichik bo‘g‘imlar zararlanganligi sababli 4 ball. 30 % bemor 10 tadan oshiq bo‘g‘im zararlanganligi sababli 5 ball. Immunologik ko‘rsatgichlar (RF, ASSP)natijasiga ko‘ra 10% bemorda aniqlanmagan – 0 ball, 37% bemorlarda zaif ijobiy natija qayd etildi – 2 ball, 53 % bemorlarda keskin ijobiy natija qayd etildi – 3 ball. Yallig‘lanish ko‘rsatgichlari (ECHT, C – reaktiv oqsil) natijasiga ko‘ra 24% bemorlarda normal ko‘rsatgich aniqlangan – 0 ball, 76 % bemorlarda ushbu ko‘rsatgich ortishi kuzakuzatilgan – 1 ball. Sinovitning davomiyligiga ko‘ra 38% bemorlarda bo‘g‘imlardagi og‘riq 6 haftadan kam vaqtda davom etgan, qolgan 62 % bemorlarda bo‘g‘imlardagi og‘riq 6 haftadan ko‘p vaqt davom etgan. O‘tkazilgan tadqiqotni EULAR/ACR 2023 bo‘yicha tasniflash asosida o‘rganilgan bemorlarning umumiy 15 % i 4 ball, 20 % i 5 ball hamda 65 % i 6-10 ball to‘pladi.

MUHOKAMA.

Revmatoid artrit surunkali kasallik bo‘lib, u organizmda yallig‘lanish keltirib chiqaradi va odatda dastlabki belgisi og‘riq sifatida namoyon bo‘ladi. Agar Revmatoid artritni erta aniqlab davolamasa bo‘g‘imlarga va uning atrofidagi to‘qimalarga jiddiy zarar yetkazadi. Bundan tashqari kasallik yurak , o‘pka yoki asab tizimi bilan bog‘liq muammolarga olib kelishi mumkin.Revmatoid artritning sabablari to‘liq aniqlanmagan. Xavf omillari orasida irsiy moyillik , chekish , semizlik, havoning ifloslanishi va gormonal fonning buzilishi kombinatsiyasidan kelib chiqqan deb hisoblanadi.

XULOSA

Agar kasallikka erta tashxis qo‘yilsa, kasallikning belgilari va rivojlanishini farmakoterapiya bilan nazorat qilish mumkin va reabilitatsiya (shu jumladan yordamchi vositalardan foydalanish) bemorning funksionalligini optimal darajada saqlashga yordam beradi. O‘z vaqtida o‘tkazilgan immunologik tekshiruvlar revmatoid artrit rivojlanishini oldini olishda eng muhim omil hisoblanadi. Bu esa insonlarni ertaroq davolanishga bog‘lash orqali ularning kasallanishini kamaytirishga hamda qo‘shma shikastlanishlar xavfini va autoimmun kasalliklarni rivojlanishini kamaytiradi. Natijada jamiyatimizda nogironlik xavfi birmuncha kamayadi, sog‘lom muhit paydo bo‘ladi.

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SCIENTIFIC ACTIVITIES OF SCIENTISTS ON THERMOELECTRIC GENERATORS

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ABSTRACT

Thermoelectric generators have emerged as a promising technology for sustainable energy conversion by harnessing waste heat and converting it into electricity through the Seebeck effect. This article reviews recent scientific advancements in TEG research, focusing on material innovation, automation in manufacturing, computational modeling, and experimental validation. Significant progress has made in improving thermoelectric conversion efficiency, reducing production costs, and enhancing the durability of TEGs [1,2]. Advanced materials such as bismuth telluride and skutterudites, coupled with automated fabrication techniques, have enabled scalable and cost-effective solutions. Computational modeling, including finite element analysis and machine learning, has played a critical role in optimizing TEG designs and predicting performance under real-world conditions. Experimental studies have demonstrated successful integration of TEGs into industrial processes, such as waste heat recovery in manufacturing and automotive systems. Despite these advancements, challenges such as material toxicity, limited efficiency at low temperature gradients, and high initial costs remain.

Keywords: *thermoelectric generators, waste heat recovery, seebeck effect, thermoelectric materials, automation in manufacturing, computational modeling, finite element analysis (fea), energy efficiency, sustainable energy, industrial applications.*

Introduction

The growing global demand for energy, combined with the urgent need to address environmental challenges, has spurred significant interest in sustainable and efficient energy technologies. Thermoelectric generators (TEGs) have emerged as a promising solution by converting waste heat into electricity through the Seebeck effect, a phenomenon where a temperature gradient across thermoelectric materials generates

an electric voltage [3,4]. This principle allows TEGs to operate without moving parts, making them reliable, low-maintenance, and suitable for a wide range of applications, from industrial waste heat recovery to automotive exhaust systems and portable electronics. Historically, the study of thermoelectric materials dates back to the 19th century, but recent advancements in material science, nanotechnology, and computational modeling have revolutionized the field. Despite these advancements, challenges such as low conversion efficiency, high material costs, and limited performance at low temperature gradients persist. This article reviews the latest scientific activities in TEG research, focusing on innovations in materials, automation, modeling, and their integration into technological processes. By examining current progress and future directions, this work aims to highlight the potential of TEGs to contribute to sustainable energy solutions and address the pressing need for efficient energy conversion technologies.

Thermoelectric generators (TEGs) have gained significant attention as sustainable energy conversion devices that directly convert heat into electricity using the Seebeck effect [5,6]. With the growing demand for energy-efficient technologies, TEGs offer a promising solution for waste heat recovery in industrial processes. Scientists are exploring advanced materials, automation, and modeling techniques to enhance the efficiency and applicability of TEGs. Key challenges include low conversion efficiency, high material costs, and integration into existing energy systems. This article reviews recent scientific advancements in TEGs, focusing on automation, modeling, and their role in energy supply for technological processes.

Methods

Material Development: Researchers are synthesizing and testing novel thermoelectric materials, such as bismuth telluride and skutterudites, to improve efficiency [7]. Automation in manufacturing: Automated systems are being employing fabricate TEG modules with precision, ensuring consistent performance and scalability. Computational modeling: Advanced simulation tools, such as finite element analysis (FEA), it used to optimize TEG designs and predict performance under varying conditions. Experimental validation: Laboratory setups are designing to test TEGs in real-world scenarios, such as industrial waste heat recovery and automotive exhaust systems. Data analysis: Machine-learning algorithms applied to analyze experimental data and identify patterns for further optimization.

The scientific investigation of thermoelectric generators (TEGs) involves a multidisciplinary approach that combines material synthesis, advanced manufacturing techniques, computational modeling, and experimental validation. Researchers begin by developing and characterizing novel thermoelectric materials, such as bismuth telluride, skutterudites, and nanostructured composites, which optimized for high

thermoelectric efficiency and stability under varying temperature gradients. Automation plays a critical role in the fabrication process, where precision engineering and robotic systems employed to produce TEG modules with consistent performance and scalability [8-10]. Computational modeling, particularly finite element analysis (FEA) and machine learning algorithms, is used to simulate and optimize the design of TEG systems, enabling researchers to predict their performance under real-world conditions and identify areas for improvement. Experimental validation conducted through laboratory setups that replicate industrial and automotive environments, where TEGs tested for efficiency, durability, and integration feasibility. Data collected from these experiments are analyzed using statistical and machine learning techniques to uncover patterns and correlations that guide further optimization. This comprehensive methodology ensures that advancements in TEG technology are both theoretically sound and practically applicable, paving the way for their widespread adoption in energy systems.

Results

Improved efficiency: Recent studies have achieved a 10-15% increase in thermoelectric conversion efficiency through material innovation and design optimization [11]. In addition, we talk about cost reduction: Automation in manufacturing has reduced production costs by up to 20%, making TEGs more economically viable. Also, need enhanced durability: new materials and coatings have extended the lifespan of TEGs in high-temperature environments. Integration success: TEGs have been successfully integrate into industrial processes, such as steel manufacturing and another, to recover waste heat and reduce energy consumption. Scalability: modeling and simulation have enabled the development of scalable TEG systems for diverse applications, from small-scale electronics to large industrial plants.

Recent scientific activities in the field of thermoelectric generators (TEGs) have yielded significant advancements in efficiency, cost-effectiveness, and practical applicability. Through the development of advanced thermoelectric materials, such as bismuth telluride and skutterudites, researchers have achieved notable improvements in thermoelectric conversion efficiency, with some studies reporting increases of 10-15% compared to traditional materials [12,13]. Automation in manufacturing has streamlined the production process, reducing costs by up to 20% and enabling the large-scale fabrication of TEG modules with consistent quality. Computational modeling, including finite element analysis (FEA) and machine learning, has proven instrumental in optimizing TEG designs, leading to enhanced performance under varying temperature gradients and operational conditions. Experimental studies have demonstrated the successful integration of TEGs into real-world applications, such as industrial heat recovery systems and automotive exhausts, where they have shown the

potential to significantly reduce energy losses and improve overall system efficiency. Additionally, advancements in material durability and thermal stability have extended the lifespan of TEGs in high-temperature environments, making them more viable for long-term use. These results collectively highlight the progress made in TEG technology and underscore its potential to contribute to sustainable energy solutions across diverse industries.

Discussion

Significance of findings: The advancements in TEG technology demonstrate their potential to contribute significantly to sustainable energy solutions. Limitations: Despite progress, challenges such as material toxicity and limited efficiency at lower temperature gradients remain. Future directions: Research is shifting toward hybrid systems that combine TEGs with other renewable energy technologies for enhanced performance. Industrial adoption: Wider adoption of TEGs in industries depends on further cost reductions and policy support for clean energy technologies. Environmental impact: The use of TEGs for waste heat recovery can significantly reduce greenhouse gas emissions and improve energy efficiency in industrial processes.

The advancements in thermoelectric generator (TEG) technology underscore its potential to play a transformative role in sustainable energy systems. The development of advanced thermoelectric materials, such as bismuth telluride and skutterudites, has significantly improved conversion efficiency, bringing TEGs closer to commercial viability. Automation in manufacturing has not only reduced production costs but also ensured the scalability and consistency of TEG modules, making them more accessible for industrial applications. Computational modeling, particularly through finite element analysis and machine learning, has provided valuable insights into optimizing TEG designs and predicting their performance under real-world conditions. Experimental validation has further demonstrated the practicality of TEGs in recovering waste heat from industrial processes and automotive systems, highlighting their ability to enhance energy efficiency and reduce greenhouse gas emissions. However, challenges remain, including the limited efficiency of TEGs at low temperature gradients, the high cost of some advanced materials, and concerns about material toxicity and environmental impact. Future research should focus on exploring novel materials, such as organic thermoelectric and hybrid systems, that can address these limitations while further improving performance. Additionally, interdisciplinary collaboration between material scientists, engineers, and policymakers will be essential to accelerate the adoption of TEG technology and integrate it into global energy systems. By addressing these challenges and building on recent advancements, TEGs

have the potential to become a cornerstone of sustainable energy solutions, contributing to a cleaner and more efficient future.

Conclusion

Scientific activities in TEG research have led to significant improvements in efficiency, cost-effectiveness, and scalability. TEGs are becoming increasingly viable for integration into automation and energy supply systems in various industries. Further studies are need to address material limitations and explore new applications for TEGs. Interdisciplinary collaboration between material scientists, engineers, and policymakers is essential for advancing TEG technology. With continued innovation, TEGs have the potential to play a pivotal role in the global transition to sustainable energy systems.

In conclusion, the scientific activities surrounding thermoelectric generators (TEGs) have demonstrated remarkable progress in advancing their efficiency, scalability, and practical applicability. Through innovations in thermoelectric materials, automation in manufacturing, and computational modeling, researchers have significantly improved the performance and cost-effectiveness of TEGs. Experimental studies have validated their potential in real-world applications, such as industrial waste heat recovery and automotive systems, displaying their ability to enhance energy efficiency and reduce environmental impact. Despite these advancements, challenges such as material limitations, high costs, and efficiency constraints at low temperature gradients remain. Addressing these issues will require continued research into novel materials, hybrid energy systems, and interdisciplinary collaboration. The findings presented in this article highlight the transformative potential of TEGs as a sustainable energy technology and underscore the importance of ongoing innovation fully realize their capabilities. By building on these advancements, TEGs can play a pivotal role in the global transition toward cleaner and more efficient energy systems.

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X-РСА И ИК-СПЕКТРАЛЬНЫЙ АНАЛИЗ СОЕДИНЕНИЯ $CaTiO_3$

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$CaTiO_3$ является перспективным материалом с сегнетоэлектрическими и параэлектрическими свойствами и широко используется в качестве активного элемента в пьезоэлектрических преобразователях, оптических модуляторах, сегнетоэлектрических накопителях, конденсаторах с высокими диэлектрическими проницаемостями, устройствах СВЧ и фотокатализаторах [1].

Инфракрасный спектрофотометр с преобразованием Фурье — надежный, компактный и простой в использовании прибор, позволяющий качественно и количественно анализировать широкий спектр газов, твердых проб и жидкостей. В наших измерениях использовался фурье-спектрометр IRTracer-100 фирмы Rigaku (Япония). Интерферометр Майкельсона имеет систему динамического числового выравнивания элементов с соотношением сигнал/шум 30 000:1. Специализированное программное обеспечение, в том числе высокоскоростное ПО «Лаборатория – ИК», дополнено системами «анализа смесей» и «определения веществ», а также системами анализа и обработки данных. Для повышения достоверности результатов использовали фурье-спектрофотометр IRTracer-100. Получен график зависимости интенсивности излучения от количества волн.

С помощью рентгеновских дифрактометров и инфракрасных спектрофотометров определяют качественный состав образца, кристаллическую структуру вещества, параметры элементарной ячейки и размер кристаллов поликристаллического образца. Используемая мощность рентгеновского излучения составляла 2 кВт. Результаты были проанализированы с использованием базы данных. Глубина проникновения излучения Cu-Ka составляет примерно 1 мм (980 мкм) для легких элементов (углерода), несколько микрон для тяжелых элементов (Ag, W). Для большинства неорганических

веществ Cu-Ka составляет десятки микрон для простых соединений.

На рис. 1 представлена спектральная зависимость $CaTiO_3$, полученная методом порошковой дифрактометрии. Степень кристалличности и аморфизма образцов оценивали методом рентгеноструктурного анализа с использованием программы «Поиск и сопоставление» [3]. Для титаната кальция аморфная фаза составляла 71,35%, а кристаллическая фаза - 28,65%. Кроме того, с помощью программы Profex определяли фазовый состав (мас. %) и элементный состав образцов $CaTiO_3$. Фазовый состав образца, приготовленного для магнетронного распыления, соответствует 90,7 % перовскита ($CaTiO_3$), 3,8 % титана и 5,5 % кальция. Элементный анализ с помощью программы «Поиск и сопоставление» показал, что образцы имели следующий состав (в массовых процентах): 35,7 % Ti, 32,2 % Ca и 32,0 % O.

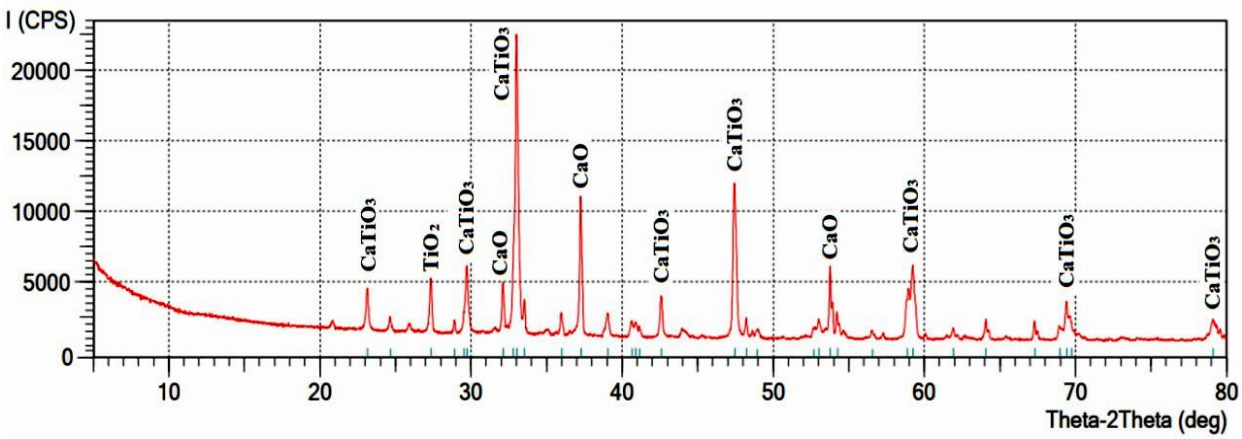

Рис. 1. Спектральная зависимость $CaTiO_3$ получена методом порошковой дифрактометрии. Приведены индексы Миллера.

Обработка данных рентгеноструктурного анализа полнопрофильным методом показала, что образец имеет ромбическую структуру (пр. гр. Pbnm) со следующими параметрами решетки: a= 5,3064 Å, b= 5,3531 Å, c = 7,1760 Å, положениями и координаты атомов в элементарной ячейке (табл. 1).

Основные широкие пики наблюдаются в диапазоне 680-400 $см^{-1}$, полоса поглощения с волновым числом 543,93 $см^{-1}$ соответствует специфическим валентным колебаниям связей Ti-O, что указывает на наличие в них октаэдров TiO_6 и $CaTiO_3$, образование структуры типа перовскита. Полоса с волновым числом 435,91 $см^{-1}$ характерна для деформационных колебаний титаната кальция Ca-Ti-O. Это связано с более слабой симметричной полосой растяжения (C-O) в диапазоне 1480-1380 $см^{-1}$. Наиболее сильные пики соответствуют волновым числам 543,93 $см^{-1}$, 435,91 $см^{-1}$, 420,48 $см^{-1}$, 405,05 $см^{-1}$, которые являются

характерными колебаниями титаната кальция в диапазоне 910-3600 $см^{-1}$ при 1100 °C; его отсутствие указывает на образование чистого $CaTiO_3$. Это наглядно показывает, что термический отжиг является известным методом синтеза перовскитных материалов из титаната кальция [4].

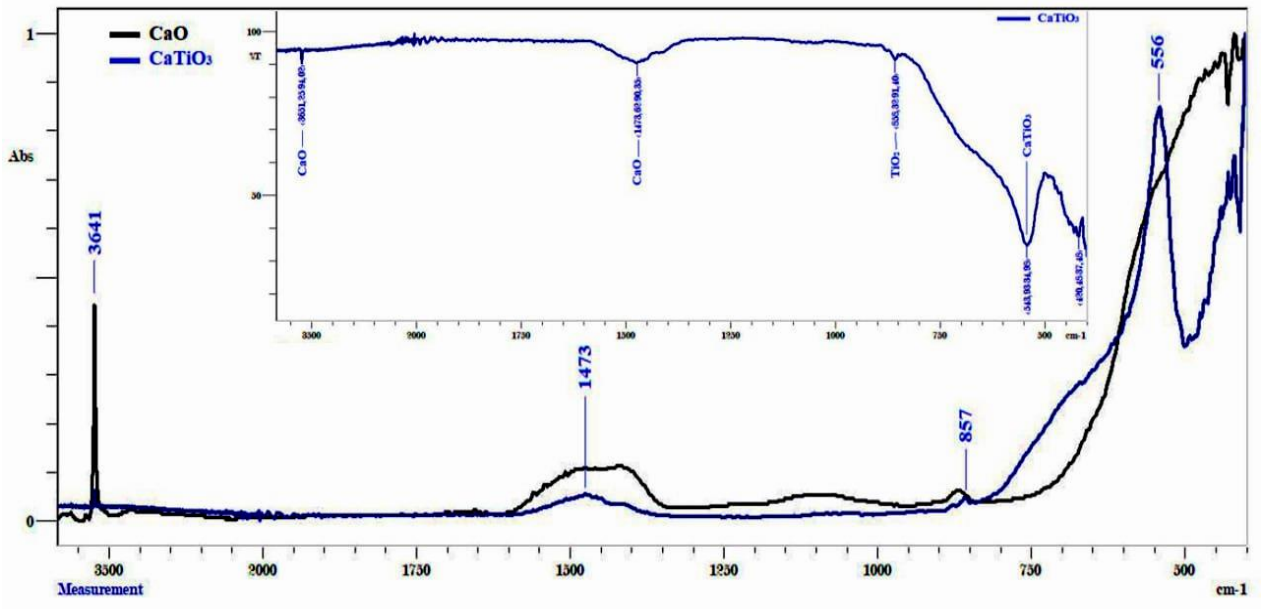

Рис. 5. ИК-Фурье-спектры поглощения и пропускания $CaTiO_3$.

Измерения рентгеновского и ИК-поглощения соединения перовскита $CaTiO_3$ показывают, что это один из наиболее универсальных оксидов семейства перовскитов для применения в таких областях, как электроника и фотоэлектрика, благодаря своей структурной структуре и оптическим свойствам. Поэтому важно развивать методы формирования полупроводниковых материалов [5].

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ANNOTATSIYA

Orol dengizini qurib borishi-bu faqat ekologik muammo emas,balki butun bir mintaqaning tarixi va madaniyati uchun katta yo‘qotishdir.Maqolada Orol fojeasining inson hayoti,salomatligi va turmush tarziga ta’siri hamda kelajak avlod uchun qoldirayotgan merosi haqida so‘z boradi.

Kalit so‘zlar: *bioakkumulyatsiya, malabsorbtsiya,astma, immigrant,insulin.*

ANNOTATION

The drying up of the Aral Sea is not only an ecological problem, but also a great loss for the history and culture of the whole world. The article talks about the impact of the Aral tragedy on human life, health and lifestyle, as well as its legacy for future generations.

Key words: *bioaccumulation, malabsorption, asthma, immigrant, insulin.*

KIRISH. Inson hech qachon tabiasiz yashay olmaydi, chunki u tabiatning ajralmas qismi hisoblanadi. Shu bilan bir qatorda ular bir biriga uzluksiz ta’sir o‘tkazib turishadi. Xo‘sh tabiatimiz bugungi kunga kelib qay ahvolga tushmoqda? Bunga kimlar sababchi? Buni qanday oldini olish mumkin? Shu kabi savollar bugungi kunning dolzarb mavzusiga aylanmoqda. Ming afsuski inson tabiatga misli ko‘rilmagan miqdorda tasir ko‘rsatadi, o‘z o‘rnida tabiat ham insonga. Inson aql-zakovati orqali, mehnat faoliyati tufayli ta’sir qilishini hech bir narsa bilan taqqoslab bo‘lmaydi. Aniqroq aytadigan bo‘lsak mavjudotlar tabiatdan qanday bo‘lsa, shunday foydalanib, unga o‘z tasirini o‘tkazadi. Insoniyat uni o‘rab turgan barcha shart-sharoitlarga moslasha oladi, moslasha olmasa, uni o‘zi istaklariga moslashtiradi, natijada tabiat muvozanati buziladi, buzilgan muvozanat esa katta ta’lofatlarga olib keladi. Bunga yaqqol misol qilib “Orol dengizi muammosini ” olsak bo‘ladi. Bugungi kunda Orol dengizi ilgari jahon hududdagi to‘rtinchi eng katta ko‘l, yo‘qolib bormoqda. 1960-yillar orasida va 1987 yilda uning darajasi deyarli 13 metrga tushib ketdi va uning maydoni 40 foizga kamaydi.Suv oqimining kamayish,sug‘orish uchun

ajratilgan suv miqdorini ortib ketishi va boshqa sabablar tufayli dengiz suvini kamayishi bilan bir qatorda bir qancha ekologik muammolar ham kelib chiqdi.

ASOSIY QISM. Avvalambor Orol dengizi relefi haqida ma'lumot bersak, Orol tabiiy geografik okrugi Turon tekisligining markaziy qismida, Ustyurt okrugi bilan Qizilqum okrugi orasida joylashgan.U shimolda Qozog'iston bilan, janubi-sharqda Qizilqum, janubda Quyi Amudaryo, g'arbda Ustyurt okruglari bilan chegaralanadi. O'tgan asrning 60-yillarigacha Orol dengizi maydoni orollari bilan o'rtacha 68,0 ming km² ni tashkil etgan. Kattaligi jihatidan dunyoda to'rtinchi o'rinda edi. Havzasining maydoni 690 ming km², suvining hajmi 1000 km³, o'rtacha chuq. 16,5 m atrofida o'zgarib turgan. Havzasining kattaligi uchun dengiz deb atalgan. Orol dengizida suv sathining yil davomida o'zgarib turishi Amudaryo va Sirdaryoning bahor-yoz paytlarida toshishi bilan bog'liq. Bahorgi yomg'irdan ham dengiz sathi ko'tariladi. Suvi sathining yil davomida o'zgarish amplitudasi o'rtacha 25 sm ga teng bo'lgan. Suvining sho'rligi o'rtacha 10-11%. Suvdagi tuzlarning ko'p qismini osh tuzi va sulfatli magniy tuzi tashkil etgan. Kimyoviy tarkibiga ko'ra, suvi Kaspiy dengizi suviga o'xshash. Orol dengizi suvining tarkibidagi tuz 11 mlrd. ga yaqin deb baholangan. Bu tuzlar sanoat ahamiyatiga ega.

Qoraqalpog'iston Respublikasi va Orolbo'yi hududlarida yashovchi aholi salomatligiga ana shu qum va tuzlari salbiy ta'siri juda katta. Orol dengizida qolgan suv yetarli emasligi sababli, bu ifloslantiruvchi moddalarning konsentratsiyasi qolgan suvlarda ham, quruq qatlamlarda ham keskin oshdi. Buning natijasida shamol tashuvchi zaharli chang juda keng tarqaldi. Daryo havzalarining quyi qismlarida va sobiq qirg'oq zonalarida yashovchi odamlar mahalliy suv ichish va ifloslangan changni nafas olish orqali ifloslantiruvchi moddalarni yutishgan. Bundan tashqari, o'simliklar va chorva mollari tomonidan so'rilishi tufayli toksinlar - ularning ko'plari bioakkumulyasiya qilinadi va jigar va buyraklar tomonidan oson parchalanmaydi. Atrofdagi hududlar aholisi odatda chuchuk suv tanqisligini boshdan kechiradi va sog'liq muammolari keng tarqalgan, jumladan, ayrim saraton kasalliklari, nafas olish kasalliklari, shu jumladan sil (asosan dorilarga chidamli), ovqat hazm qilish kasalliklari, kamqonlik va yuqumli kasalliklar. Jigar, buyrak va ko'z muammolari ham zaharli chang bo'ronlari tufayli bo'lishi mumkin. Birgalikda bu zaif yosh guruhlari orasida noodatiy yuqori o'lim ko'rsatkichini ko'rsatdi: 2009-yildam beri bolalar o'limi har 1000 kishiga 75 tani tashkil etdi, onalar o'limi esa har 1000 tadan 12 tani tashkil etgan. Insoniyatning daryo suvidan foydalanishi ortishi bilan ko'l suvining tarkibi o'zgardi. Tuz konsentratsiyasi o'n barobar oshdi va mahalliy yer osti suvlari tuz konsentratsiyasi 6 g/L ga yetdi. Bu JSST tomonidan xavfsiz deb topilgan konsentratsiyadan olti baravar yuqori. Tabiiyki, mahalliy aholi sho'r suv is'temoliga duchor bo'lgan va 2000 yilda faqat 32% xavfsiz ichimlik suviga ega bo'lgan .

Bo‘ronlarning ko‘payishi har yili qurigan dengiz tubidan havo orqali 43 million tonna chang va qumni olib yuradi . Shunga ko‘ra, changning cho‘kish darajasi dunyodagi eng yuqori ko‘rsatkichlardan biridir va ko‘p miqdorda tuzlar va pestisidlarni o‘z ichiga oladi. O‘g‘itlar, xlorli organik pestisidlar va boshqa kimyoviy moddalar qishloq xo‘jaligi maqsadlarida ko‘p miqdorda qo‘llanilgan va ifloslantiruvchi moddalarga boy suv Orol dengizini ta’minlovchi daryolarga qaytgan. Orolbo‘yida yashash, bu hududda tug‘ilgan odamlarda ham, katta yoshli immigrantlar uchun ham tug‘ilish uchun zararli oqibatlarga olib keladi. Shu bilan birga, tana massasi indeksi (BMI) 7 yoshdan 17 yoshgacha bo‘lgan bolalarda PCB, DDT va DDE larning qon konsentratsiyasi bilan teskari bog‘liq bo‘lib, malabsorbsiya ta’siri sifatida ilgari surilgan. 1-toifa insulinga o‘xshash o‘sish omili (IGF-1) qiymatlari tana massasi indeksining pasayishi bilan bog‘liq edi . Ma’lumki, past IGF-1 qiymatlari tanadagi DDT yoki DDT metabolitlarining yuqori konsentratsiyasi bilan bog‘liq bo‘lishi mumkinOrol dengizidan 200 kilometr uzoqlikdagi hududda maktab o‘quvchilarining hayotiy qobiliyati past va yo‘tal tez-tez uchraydi. Ajablanarlisi shundaki, changga ta’sir qilish astma tarqalishi bilan bog‘liq emas edi. Shu sababli, ekologik ofat respirator kasalliklarning chastotasiga bevosita ta’sir ko‘rsatdimi yoki yo‘qmi hali ham noaniq. So‘nggi yillarda jigar saratoni ikki baravar ko‘paydi , qizilo‘ngach, o‘pka va oshqozon saratoni bilan kasallanish eng yuqori ko‘rsatkichlarni qayd etdi. Bundan tashqari Orolbo‘yi hududiga oqib tushadigan daryolar yo‘qolib borayotganligi sababli ichimlik suvi juda qimmatli manba hisoblanadi. Suv tanqisligi va saqlanadigan ichimlik suvining ifloslanishi Orolbo‘yidagi xonadonlarda kasallikning fekal-og‘iz orqali yuqishining muhim sabablari hisoblanadi. Shunga ko‘ra, gepatit A va diareya kasalligi tez-tez qayd etiladi.Darhaqiqat, ko‘p dori-darmonlarga chidamli sil kasalligi ushbu mintaqada jiddiy muammo tug‘diradi.Sanitariya va suv ta’minotining yetarli emasligi bolalar o‘limining asosiy global omillaridan biri bo‘lgan diareya kasalligi uchun katta xavf tug‘diradi. Xavfsiz suvdan foydalanish imkoniyati ortib borayotgan bo‘lsa-da, Orol dengiziga ta’sir qiladigan ekologik ofatlar va iqlim o‘zgarishining kutilmagan oqibatlari bu rivojlanishga to‘sqinlik qilishi mumkin.

XULOSA. Ko‘rib turganimizdek, global, mintaqaviy va mahalliy iqlim o‘zgarishi inson salomatligi uchun salbiy oqibatlarga olib kelishi mumkin. Insonning iqlimga potensial ta’sir ko‘rsatishi mumkin bo‘lgan barcha harakatlari puxta o‘ylab ko‘rilishi zarurligidan dalolat beruvchi xavotirli signaldir bu Orol fojeasidir.

Foydalanilgan adabiyotlar ro‘yhati

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QAZISH LAHIMLARIDAGI SELIKLARNING USTIVORLIGI BAHOLASHNING ASOSIY GEOMEXANIK USULLARI TAHLILI

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ANNOTATSIYA

Ushbu maqolada qazish lahimlarida seliklarning ustuvorligini ta’minlash uchun geomexanik qoidalar va usullar tahlil qilinadi. Lahimlarning ustuvorligini baholashda ularning shakli, o‘lchamlari va geomexanik xususiyatlari muhim ahamiyatga ega. Maqolada, kon-texnologik jarayonlarda seliklarning optimal parametrlarini aniqlash, ularning geologik sharoitlarga mos ravishda ta’sirini baholash, shuningdek, ustuvorlikni saqlash bo‘yicha tegishli tavsiyalar keltirilgan. Tahlilga asoslangan holda, seliklarni o‘rnatish usullari, ularning kuchlanish va deformatsiya holatlariga ta’siri, shuningdek, ekspluatatsiya davomida yuzaga keladigan xavf-xatarlarni minimallashtirishga doir metodlar ko‘rib chiqiladi. Maqola natijalari qazib olish jarayonlarida lahimlarning mustahkamligini ta’minlash va xavfsiz ekspluatatsiyani amalga oshirish uchun ilmiy asoslangan yondashuvlar yaratishga yordam beradi.

Kalit so‘zlar*: lahim, ustivorlik, tog‘ jinsi, ekspluatatsiya, seliklar, buzilishlar, geomexanika, kuchlanish, deformatsiya.*

ANALYSIS OF THE MAIN GEOMECHANICAL METHODS FOR EVALUATING THE STABILITY OF ROOFS IN MINING TUNNELS.

ABSTRACT

This article analyzes geomechanical principles and methods for ensuring the stability of pillars in excavation workings. When assessing the stability of workings, their shape, dimensions, and geomechanical properties are of great importance. The article presents relevant recommendations for determining the optimal parameters of pillars in mining and technological processes, evaluating their impact in accordance with geological conditions, as well as maintaining stability. Based on the analysis, methods for establishing pillars, their impact on stress and strain states, as well as methods for minimizing risks arising during operation, are considered. The results of

the study will contribute to the creation of scientifically grounded approaches to ensuring the stability of workings during mining processes and implementing safe operation.

Keywords: *working, stability, rock, exploitation, pillars, failures, geomechanics, stress, deformation.*

KIRISH

Zamonaviy konchilik va geologiya sohalarida qazish ishlarining samaradorligini oshirish va xavfsizligini ta’minlashda geomexanika asosiy o‘rin egallaydi. Konning ekspluatatsiya jarayonida, ayniqsa, yer osti qazish ishlari davomida lahimlarning ustuvorligini saqlashning ahamiyati katta. Lahimlar, ya’ni qazish bo‘shliqlarini himoya qilish uchun qoldirilgan jinslar, tog‘ jinslarining buzilishining oldini olishda, kuchlanish va deformatsiyalarning oqilona taqsimlanishida muhim rol o‘ynaydi. Ustuvorlikni ta’minlash, qazish jarayonining xavfsizligini oshirish, shu bilan birga, konning ishlab chiqarish samaradorligini maksimal darajaga yetkazishga yordam beradi.

Bunday sharoitda, lahimlarning geomexanik tavsiflari, ularning mustahkamligi va deformatsiyalanishi, shuningdek, ekspluatatsiya sharoitlariga mos ravishda optimal o‘lchamlari va shakllarini aniqlash juda muhimdir. Seliklarning ustuvorligi, qazish ishlari davomida ko‘p hollarda to‘g‘ri boshqarilmasa, buzilishlar, yer yuzasiga ko‘chish va ko‘chkilarni keltirib chiqarishi mumkin. Shuning uchun, bu masalani ilmiy asosda tadqiq etish, ularning geomekanik xususiyatlarini chuqur tahlil qilish va ustuvorlikni ta’minlash bo‘yicha samarali usullarni ishlab chiqish zarur.

Ushbu maqolada qazish lahimlaridagi seliklarning ustuvorligini ta’minlashga doir geomexanik qoidalar va metodlar tahlil qilinadi. Lahimlarning ustuvorligini saqlashda ularning optimal parametrlarini aniqlash, seliklarning turli shakl va o‘lchamlarini konning geologik sharoitlariga mos ravishda belgilash muhim ahamiyatga ega. Maqolada shuningdek, seliklarni o‘rnatish va ularning geomexanik sharoitlariga ta’sirini baholash bo‘yicha takliflar keltiriladi.

ADABIYOTLAR TAHLILI.

Jins mustahkamligi atamasi bo‘yicha, bunda buzilmagan holda turlicha tezligi va xarakterli tashqi kuchlarga qarshilik qila olish qobiliyati tushiniladi. Jinsning ichki bog‘lamlari buzilsa bu jins o‘z mustahkamligini yo‘qotadi va parchalanish vujudga keladi.

Tashqi kuchlar yo‘nalishi va deformatsiyalanish xarakteriga qarab jinsning mustahkamlik chegarasini bir, ikki, uch o‘qli (har tomonlama) siqish, cho‘zish, har xil burchaklar tomon siljishi, egish va boshqalar bo‘yicha ajratiladi.

Tog‘ jinslarining bir o‘qli siqish, cho‘zish, siljish, ezishga qarshiligi mexanik tavsifi bo‘lib, soda kuchlanganligi holatidagi mustahkamligini ko‘rsatadi. Kon-texnologik yoki muxandislik qurilmalarida jinslar yo o‘sha muhitda yoki o‘rganilayotgan muhitning asosi bo‘ladi. Birinchi va ikkinchi holda ham tog‘ jinslaridagi kuchlanganlik holati yetarlicha murakkab bo‘lib, mustaqilligi va deformatsiyalanish xarakterida ko‘rinadi.

Ushbu ma’lumotlarni vizual tarzda ifodalash uchun quyidagi o‘rganishni taklif qilish mumkin:

1. Lentasimon va ustunsimon seliklarning taqqoslanishida.

Lentasimon va ustunsimon seliklarning geomexanik sharoitlarga ta’siri:

- **Lentasimon seliklar**: Yassi deformatsiya sharoitida ishlatiladi.
- **Ustunsimon seliklar**: Bir o‘qli kuchlanish holatida samarali.

Bir qancha geomexanik sharoitlarda lentasimon va ustunsimon seliklarning samaradorligini taqqoslash. Lentasimon seliklarning deformatsiyaga chidamliligi, ustunsimon seliklarning esa vertikal kuchlanishga qarshi qobiliyati grafik shaklda ko‘rsatilgan bo‘ladi.

2. Seliklarning o‘lchamlari va shakllariga ta’siri.

Seliklarning o‘lchamlari va shaklini o‘zgartirishning kon ekspluatatsiyasiga ta’siri:

- **Katta seliklar**: Nobudgarchilikka olib kelishi mumkin.
- **Kichik seliklar**: Ko‘chkilarni keltirib chiqaradi.

3. Seliklarning ustuvorligini saqlash bo‘yicha parametrlar.

Seliklarning ustuvorligini saqlashda optimallashtirish parametrlarining ta’siri:

- Seliklarning shakli va o‘lchami;
- Geomekanik xususiyatlar (kuchlanish, deformatsiya);
- Texnologik sharoitlar (geologik sharoitlar);

4. Seliklarning deformatsiyasi va qazib olish samaradorligi.

Seliklarning deformatsiyasi va qazib olish samaradorligiga ta’siri.

- **Seliklarning deformatsiyasi**: Buzilishlar va ko‘chkilarni keltirib chiqaradi.
- **Samaradorlik**: Qazib olish jarayonining samaradorligini kamaytiradi.

MUHOKAMA VA NATIJALAR

Lahimlarning ustivorligini ta’minlashda uning shunday holati tushuniladiki, bunda texnologik jarayonlar o‘z meyorida bajariladi va ishchilarning xavfsizligi qo‘shimcha tadbirlarsiz ta’minlanadi.

Mexanik ustivorligi tushunchasi biron-bir tizimning ma’lum bir berilgan vaqt davomida ustivorlik holatini saqlab turishini belgilaydi. Kon lahimlariga nisbatan

ustivorlik tushunchasi ekspluatatsiya ya’ni kon ishlarini bexatar olib borishni ta’minlash uchun kerak bo‘lgan vaqt davomida lahimning shakli va o‘lchamlarini saqlanish xususiyatlari tushuniladi.

Shipning ochilgan qismi (kamera eni) o‘lchamlarini boshqarish maqsadida qazib olingan joyda (bo‘shliqda), ruda tanasi yoki yondosh jinslarning buzilmagan uchastkalaridan selik qoldirib ketiladi. Shunga ko‘ra, qo‘llanilgan texnologiyaga bog‘liq qoldirilgan seliklar foydali qazilmani asosiy qismi kavlab olingandan keyin qazib olinadi yoki uchastkalarda, gorizontlarda yer ostida qoladi Tabiiyki bu texnologiya foydali qazilmaning nobudgarchiligini ortishiga olib keladi. Seliklarni qayta qazib olishda, qoidaga ko‘ra o‘ziga xos qazib olish tizimi qo‘llanishini talab qilinadi.

Geomexanik nuqtai nazardan qaraganda seliklarning vazifasi atrofdagi massivda deformatsiyalarning oshishini (rivojlanishini) oldini olish va buzilish zonalarining o‘lchamini kengayishini oldini olishdan iboratdir.

Qazish kamera (bloklarni) ustivorlgini saqlash, tayyorlov lahimlarini saqlash hamda qo‘shni uchastkalardagi qazish ishlarining ta’sirini qaytarish uchun vaqtinchalik seliklar qoldiriladi. Bu ko‘p ishlatiladigan selik bo‘lib, xizmat qilish muddati bir necha yilgacha, ya’ni alohida uchastkalar, bloklar yoki kameralarni qazib olish davri davomida foydalaniladi.

Agarda qoldirilgan seliklarning o‘lchamlari ortiqcha katta bo‘lsa, behuda nobudgarchiliklar yuzaga keladi, teskari holda selikning o‘lchami keragidan kichik bo‘lsa, unda ularda buzilishlar sodir bo‘ladi. Bu seliklardagi buzilishlar xavfli ko‘chkilar hosil qilib, qo‘shni uchastkalardagi seliklarni ham buzib yuborishi mumkin.

Seliklarni joylashtirishning turli-tuman sxemalari asosan qatlamli va ruda konlarida uchraydi, ular quyidagicha bo‘lishi mumkin:

a) bir-xil o‘lchamli va shakli cheksiz, davriy ketma-kelikda kameralararo, stvololdi va boshqa shakldagi seliklar;

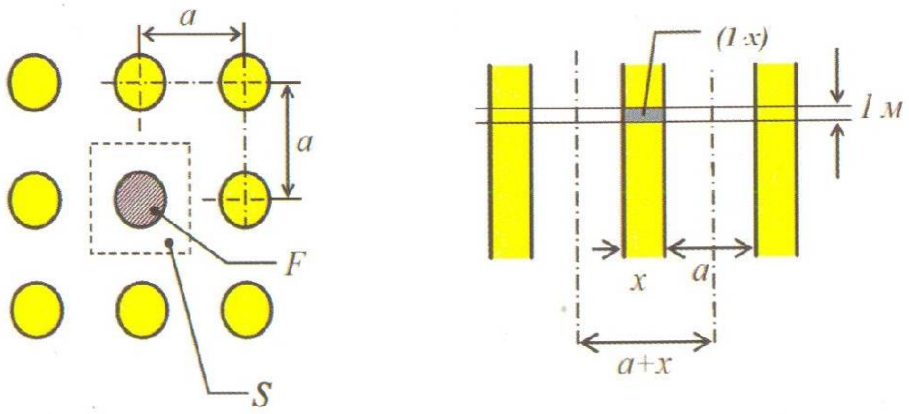
b) turli o‘lcham va shakldagi cheksiz davriy ketma-ketlikdagi seliklar;

v) tizimsiz joylashgan turli o‘lchamdagi va konfiguratsiyadagi seliklar;

g) turlicha parametrli yakka seliklar.

Bunda gorizontal kesimi bo‘yicha seliklar lentasimon va ustunsimon turlarga bo‘linadi (1- chizma).

a b



1-rasm. Kameralararo ustunlar va seliklar qoldirish tartibi a) ustunsimon selik sxemasi, b) uzun stolbali selik sxemasi.

Geomexanik nuqtai nazardan qaraganda lentasimon va ustunsimon seliklar turlicha sharoitlar uchun xizmat ko‘rsatadi. Lentasimon seliklar-yassi deformatsiya sharoitida, ustunsimon seliklar-bir o‘qli kuchlanish holati ta’sir qilgan sharoitida qo‘yiladi.

Shu sababli tog‘ jinsi massivida birxil tizimda qazib olingan bo‘shliq (kamera) va seliklar hosil qilinadi, ularning eng optimal parametrlari hamma holatlarda o‘zaro bog‘langan bo‘lishi shart.

Shu bilan birga kamera va seliklarning parametrlari bevosita tog‘ jinsi massivi zonasining o‘lchamiga bog‘liq bo‘ladi. Shunga ko‘ra qazib olish tizimining eng optimal parametrlari, shu jumladan qazish lahimlari (kameralari) va seliklar o‘lchamlarini aniqlash uchun, butun tizimlarning: qazish lahimi tagi selik qazish lahimi shipi yuqorida joylashgan jinslar qatlamida sodir bo‘ladigan kuchlanish deformatsiya holatini ko‘rib chiqish lozim.

Shunga o‘xshash tazimlarni tadqiq qilishning eng qulay uslublari tahliliy usul va matematik modellashtirish usullaridir. Bunda butun tizimning holatini, shuningdek, uning alohida elementlarini, amaliy jihatdan istalgan darajada to‘liq baholash mumkin.

Ushbu maqola kon jinslarining mustahkamligi, kon geologiyasida jinslarning turli parametrlari va ularning ekspluatatsiya jarayonlaridagi roli haqida keng qamrovli tahlilni taqdim etadi. Ushbu ma’lumotlar asosan konning mustahkamligini va uning ekspluatatsiya sharoitida xavfsizligini ta’minlash uchun zarur bo‘lgan parametrlarni ko‘rsatadi. Maqolani ilmiy asoslash va muhokama qilish uchun quyidagi jihatlarni muhokama qilish mumkin:

1. **Kon jinslarining mustahkamligi va uning o‘zgarishlari**: Kon jinslarining mustahkamligi bir qator omillarga bog‘liq, jumladan jinsning petrografik tarkibi, mineral struktura, suvlilik darajasi, namlik, va texnologik sharoitlar. Jinslar ta’siri ostida qurilish va qazib olish jarayonlarida yuzaga keladigan deformatsiyalar va buzilishlar konning ekspluatatsiyasini to‘g‘ri va xavfsiz amalga oshirishda katta ahamiyatga ega. Natijada, jinsning mustahkamligi va deformatsiyasi haqida chuqur bilim, xavfsizlikni ta’minlash va samarali kon ishlarini bajarishda muhimdir.
2. **Seliklar va ularning roli**: Seliklarning vazifasi atrofdagi massivda deformatsiyalarni boshqarish, buzilish zonalarini kamaytirish va konning uzoq muddatli ishlashini ta’minlashdir. Seliklar qoldirish texnologiyasi asosida konni mustahkamlash, yanada samarali qazib olish tizimlarini yaratish va qoldirilgan resurslarning nobud bo‘lishini oldini olish uchun eng optimal parametrlarni aniqlash zarur. Geomexanik nuqtai nazardan, lentasimon va ustunsimon seliklarning ta’sir sharoitlari farqlanadi va bu tanlov konning geologik va texnologik xususiyatlariga mos ravishda amalga oshirilishi kerak.
3. **Kamera va seliklarning parametrlari**: Kamera va seliklarning o‘lchamlari va shakllari tog‘ jinsi massivi holatiga mos kelishi lozim. Qazib olishning optimallashtirilgan tizimlarini shakllantirishda, bu parametrlar to‘g‘ri hisobga olinishi zarur. Qoldirilgan seliklar va ularning konfiguratsiyasi konning xavfsizligini ta’minlash uchun mas’uliyatli yondashuvni talab qiladi.
4. **Matematik modellashtirish va tahliliy usullar**: Konni ekspluatatsiya qilish jarayonida eng optimal qazish parametrlarini aniqlash uchun matematik modellashtirish va tahliliy usullarni qo‘llash ayniqsa foydalidir. Ushbu metodlar kon geologiyasining murakkabligini va o‘zgaruvchanliklarini hisobga olgan holda, resurslarning samarali va xavfsiz qazib olinishi uchun kerakli parametrlarni tahlil qilish imkonini beradi.
5. **Lahimlar va ekspluatatsiya jarayonlarida xavfsizlik**: Ekspluatatsiya jarayonlarida lahimlarning mustahkamligi va ustivorlik holatini saqlab qolish, ishchilarning xavfsizligini ta’minlash uchun zarur. Qoldirilgan seliklar, kameralar o‘lchamlari va konfiguratsiyalarining to‘g‘ri tanlanishi bu jarayonlarning xavfsizligini ta’minlashda muhim rol o‘ynaydi.

Ushbu tahlil orqali kon jinslarining mustahkamligini ta’minlashda geologik va mexanik parametrlarning ahamiyati hamda ekspluatatsiya jarayonlarida ularni to‘g‘ri boshqarish zarurligi ko‘rsatiladi. Seliklar, lahimlar va boshqa geomexanik elementlar o‘rtasidagi o‘zaro bog‘lanishlar, qazib olishning xavfsiz va samarali amalga oshirilishini ta’minlash uchun to‘g‘ri tanlangan bo‘lishi kerak. Matematik modellashtirish va tahliliy usullar yordamida bu jarayonlar to‘liq baholanishi va optimallashtirilishi mumkin.

Tadqiqot natijalari, lahimlarning ustuvorligini saqlash uchun seliklarning o‘lcham va shakllarini aniq belgilash zarurligini ko‘rsatdi. Seliklar, qazish jarayonida yuzaga keladigan kuchlanishlarni taqsimlash va buzilishlarni oldini olishda muhim rol o‘ynaydi. Ularning to‘g‘ri o‘rnatilishi konning ekspluatatsiya jarayonlarida xavfsizlikni ta’minlashga, shuningdek, qazib olishning samaradorligini oshirishga yordam beradi.

Lahimlar o‘lchamlari va shaklini belgilashda geologik va texnologik sharoitlarning ta’siri katta. Seliklarning ortiqcha katta yoki kichik bo‘lishi kon ishlarining xavfsizligini pasaytirishi mumkin. Katta seliklar qazib olishning samaradorligini pasaytirib, nobudgarchiliklarga olib kelishi, kichik seliklar esa yer yuzasiga ko‘chish va ko‘chkilarni keltirib chiqarishi mumkin. Shuning uchun, seliklarning optimal o‘lchamini aniqlashda geomekanik tahlil va hisob-kitoblar muhimdir.

Bundan tashqari, qazish jarayonlarida seliklarning turli shakllarini, masalan, ustunsimon yoki lentasimon seliklarni qo‘llash, geomekanik sharoitlarga qarab, eng samarali natijalarni ta’minlaydi. Lentasimon seliklar yassi deformatsiya sharoitida, ustunsimon seliklar esa bir o‘qli kuchlanish holatida samarali bo‘lishi mumkin. Bu esa, o‘z navbatida, konning mustahkamligini saqlashda va ekspluatatsiya jarayonini xavfsiz va barqaror amalga oshirishda muhim ahamiyatga ega.

Shu bilan birga, seliklarni joylashtirishning optimal sxemalari va ularning geomekanik xususiyatlarini to‘g‘ri belgilash, qazib olish tizimining samaradorligini oshiradi. Tadqiqotlar, shuningdek, qazish lahimlaridagi seliklarning ustuvorligini saqlashda geomekanik modellash va tahlil metodlarini qo‘llashning muhimligini ta’kidladi. Bu metodlar, ustuvorlikni ta’minlashda yuzaga keladigan qiyinchiliklarni oldini olish, shuningdek, qazib olish jarayonlarini yaxshilashga yordam beradi.

Natijada, qazish jarayonida seliklarning ustuvorligini ta’minlash uchun ilmiy asoslangan yondashuvlar, geomekanik tahlil va modellashtirishning qo‘llanilishi zarur. Seliklarning optimal shakl va o‘lchamlarini aniqlash, konning ekspluatatsiya xavfsizligini oshirish va samaradorligini yaxshilashda muhim rol o‘ynaydi.

XULOSA

Maqolada qazish lahimlaridagi seliklarning ustuvorligini ta’minlashning geomexanik qoidalari va metodlari batafsil tahlil qilindi. Tadqiqotlar shuni ko‘rsatdiki, lahimlarning mustahkamligini saqlash va ekspluatatsiya jarayonlarida yuzaga keladigan xavf-xatarlarni oldini olish uchun seliklarning optimal shakli va o‘lchamlarini aniqlash zarur. Geomexanik nuqtai nazardan, seliklar tog‘ jinslarining deformatsiyasini boshqarish va buzilish zonalarini minimallashtirishda muhim rol o‘ynaydi.

Bundan tashqari, seliklarni o‘rnatishning turli sxemalari va ularning har bir geologik sharoitga mos keladigan parametrlarini aniqlash, qazish jarayonlarini xavfsiz va samarali olib borish uchun muhimdir. Maqolada keltirilgan nazariy tahlillar va amaliy tavsiyalar qazib olish jarayonining samaradorligini oshirishga, shuningdek, yer osti ishlarida seliklarning ustuvorligini ta’minlashga yordam beradi.

Shu bilan birga, qazish ishlari davomida lahimlarning shakli, o‘lchami va joylashuvini to‘g‘ri boshqarish orqali kon ekspluatatsiyasining xavfsizligi va unumdorligi yaxshilanadi. Buning uchun geomexanika sohasida yanada chuqurroq tahlillar va modellashtirish usullarini qo‘llash zarur bo‘ladi.

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CHIGITLI PAXTA XOM ASHYOSINI QABUL QILISH JARAYONINI TAKOMILLASHTIRISH

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Annotatsiya. *Maqola paxtani o‘z vaqtida qabul qilish, to‘g‘ri jamlash, markazlashtirilgan holda quritish va tozalash, lozim bo‘lgan holda saqlashni ta’minlash bo‘yicha olib borilayotgan chora tadbirlar haqida.*

Kalit so‘zlar: *Zonalar, namlik, konditsion vazn, klassikatorlar, ayvonlar, g‘aram maydonlari, namuna, nuqtali namuna, birlashgan namuna, o‘rtacha kunlik namuna, ifloslanganlik.*

В статье говорится о мерах, принимаемых для обеспечения своевременного поступления хлопка, правильного сбора, централизованной сушки и очистки, правильного хранения.

Ключевые слова: *Зоны, влажность, условная масса, классификаторы, навесы, зерновые площади, проба, точечная проба, групповая проба, среднесуточная проба, засоренность.*

The article is about the measures taken to ensure timely receipt of cotton, proper collection, centralized drying and cleaning, and proper storage.

Key words: *Zones, humidity, conditional weight, classifiers, canopies, grain areas, sample, point sample, group sample, average daily sample, weed infestation.*

KIRISH

Ma’lumki, qishloq xo‘jalik mahsulotlari yilning muayyan mavsumida yetishtiriladi, shu sababli ularni uzoq vaqt saqlash va qayta ishlashni tashkil qilmagan holda aholini yil bo‘yi turli mahsulotlar bilan ta’minlash masalasini hal qilib bo‘lmaydi. Qishloq xo‘jalik mahsulotlarini yetishtirish ko‘paygan sari ularni saqlash va qayta ishlash ham takomillashtirilib borilmoqda, yangi zamonaviy texnika va texnologiyalar bilan jihozlanib, mahsulotni iste’molchilarga sifatli yetkazib berishning eng so‘nggi usullaridan keng foydalanilmoqda. Mahsulotlarini yig‘ish, tashish, saqlash va qayta ishlashni tashkil qilish jarayoniga ilmiy yondoshilsa, fan-texnika yutuqlari

hamda ilg‘or tajribalarga tayanib ish ko‘rilsa, qishloq xo‘jaligi mahsulotlarini sifatli saqlashga va uni standart talablariga mos holda qayta ishlashga erishiladi. Yer yuzidagi xalqlar qishloq xo‘jalik mahsulotlarini iste’mol qilishni boshlagandan buyon uni saqlash va qayta ishlash bilan shug‘ullanib uni doimo rivojlantirib kelishgan. Qiyin mehnat evaziga yetishtirilgan mahsulotni zarar ko‘rsatmasdan hamda uning sifatini saqlab qolgan holda saqlash, undan unumli foydalanish inson ehtiyojlaridan biri bo‘lib kelgan. Bunda turli xil zararkunandalardan himoya qilish to‘grisida ham bosh qotirib kelishgan. Shuningdek, to‘qimachilik sanoati korxonalarining paxta tolasiga bo‘lgan bugungi talabi, paxtani sifatli qilib qo‘lda va mashinada terish tartib qoidalari, paxtani qabul qilib olish va saqlash usullari, dastlabki qayta ishlash, tola tuzilishi uning sifatini aniqlovchi asbobuskunalar bilan ishlash, paxta xom ashyosini yig‘ib terib olish, topshirish, quritish, saqlash, qayta ishlash borasida chet el texnika va texnologiyalari bilan tanishishni o‘z ichiga oladi. Respublikada paxtachilik - qishloq xo‘jaligining yirik tarmoqlaridan biri hisoblanib, davlat iqtisodida, xalqning moddiy farovonligini yuksaltirishda muhim ahamiyatga ega. Respublika iste’mol fondining asosiy qismi paxta xom ashyosidan ishlab chiqariladigan sanoat maxsulotlaridan tashkil topadi. Sanoat va oziq-ovqat mollarini ishlab chiqarishda chigitli paxta eng kerakli xom ashyo turlaridan biri hisoblanadi. U o‘zining ahamiyati jihatidan davlat iqtisodiyotida g‘alla, oltin, neft va boshqa mahsulotlar uchun g‘oyat muhim xom ashyo turlari bilan bir qatorda turadi.

Paxtani qabul qilishga tayyorlash va qabul qilish, jamlash

Paxtani o‘z vaqtida to‘g‘ri qabul qilish, to‘g‘ri jamlash, markazlashtirilgan holda quritish va tozalash, lozim bo‘lgan holda saqlashni ta’minlash bo‘yicha paxta tozalash zavodi va tayyorlov punktining asosiy quyidagi vazifalar mavjut:

- dexqon xo‘jaliklari bilan paxta sotish va sotib olish uchun kontraktsiya shartnomalari tuzish va ularning bajarilishini nazorat qilish;
- xo‘jaliklarda paxtani yuqori sifatli qilib mashinada va qo‘lda terishni tashkil qilish va ta’minlash hamda uni navlarga to‘g‘ri ajratish bo‘yicha yo‘l-yo‘riq ko‘rsatish;
- paxtani yetishtirib beruvchi xo‘jaliklarni amaldagi davlat standartlari, paxta xarid narxlarining preyskurantlari va boshqa me’yoriy hujjatlar bilan ta’minlash;
- ko‘rinarli joyda respublika standartlarining asosiy qoidalarini, paxtaning xarid narxlarini, xavfsizlik texnikasidagi yong‘indan saqlanish texnikasi bo‘yicha ogohlantiruvchi yozuvlarni ilib qo‘yishi;
- chigitli paxta xom ashyosini qabul qilish, tashish, g‘aramlash va saqlashda texnologik mexanizmlardan to‘liq foydalanish;

- transport vositalari, maydonchalar, omborlar, tarozi xo‘jaligi, laboratoriya uskunalari, brezentlar, asboblar, o‘rash va boshqa materiallardan oqilona va tejamli foydalanish;
- chigitli paxtani respublika standartlariga rioya qilgan holda o‘z vaqtida beto‘xtov qabul qilib olish;
- qabul qilingan paxtani selektsion va sanoat navlari, sinflari bo‘yicha bir xil to‘dalarga jamlab, urug‘lik chigitni reproduktsiyalar (avlodlar) va dala guruhlari bo‘yicha alohida to‘dalarga ajratish;
- quritish-tozalash tsexining unumli ishlashini ta’minlash;
- qat’iy buxgalteriya hisobi va hisobotini tashkil qilish;
- xo‘jaliklar bilan qabul qilingan paxta uchun o‘z vaqtida va to‘g‘ri hisob-kitob qilish, tayyorlangan butun paxtani to‘g‘ri saqlash va uni tayyorlov punktidan dastlabki ishlab chiqarish uchun zarur miqdor va assortimentda paxta zavodiga o‘z vaqtida tashishni tashkil qilish;
- saqlash-quritish, tozalash va tashishda paxta sifatining buzilishi va nobudgarchiligining oldini oluvchi tadbirlar qo‘llash;
- Tayyorlov punktida paxtani qabul qilish, saqlash, tozalash va uni paxta zavodiga tashish bilan bog‘liq bo‘lgan xarajatlarni kamaytirish bo‘yicha tadbirlarni amalga oshirish;
- Tayyorlov ishining hamma bosqichlarida maxsus yo‘riqnomalarga muvofiq yong‘inga qarshi tadbirlar o‘tkazish va xavfsizlik texnikasi qoidalariga rioya etish;
- qabul qilingan va saqlanayotgan paxtani, albatta, tortib hisoblash va uni tayyorlov punktidan jo‘natishda va paxta zavodida qabul qilishda sifatini to‘g‘ri aniqlash.

Tayyorlov punktlarining raxbariyati xo‘jalik xodimlarini amaldagi qonunchilikka asoslangan respublika standartlari, standart namunalari va paxtaga haq to‘lash tartibi bilan tanishtirishi shart. Shu maqsadda terim boshlanishidan kamida 10 kun avval xo‘jaliklarda fermerlar, mexanizatorlar va topshiruvchilar ishtirokida paxtani sifatli terish hamda uni tayyorlov punktiga topshirish bo‘yicha kengash (seminar) o‘tkazilishi kerak. Paxta topshiruvchilardan qabul qilganda uning sifati faqat tayyorlov punktining laboratoriyasi tomonidan aniqlanadi. Agar paxta namunalarini tanlash va sifatini tahlil qilish shu tayyorlov punktining laboratoriyalari tomonidan bajarilmagan bo‘lsa, ular haqiqiy emas deb xisoblanadi. Paxtaning konditsion vazni katta klassifikatorga boysinmaydigan laboratoriya belgilaydigan namligi va iflosligi kursatkichlariga bog‘liqligini hisobga olib, katta klassifikator paxtani laboratoriya tahlilidan o‘tkazishda ishtirok etishi mumkin. Agar olingan laboratoriya natijalaridan rozi bo‘linmasa, katta klassifikator paxtaning sifatini takror tahlil etilishini talab

qilishga xaqli. Bu haqda qabul paytida namunalar oluvchi katta klassifikator yoki klassifikator laboratoriya qayd daftariga yozib qo‘yadi. Bunday holda laboratoriya klassifikator ishtirokida qayta tahlil o‘tkazilib, uning natijasi jurnalda «takroriy» deb yoziladi. Agar takroriy tahlil natijasi dastlabki belgilangan chegaralarda bajarilgan bo‘lsa, unda dastlabki aniqlangani to‘g‘ri hisoblanib, katta klassifikator bunga rozi yoki norozi bo‘lishidan qat’i nazar, topshiruvchi bilan hisob-kitob qilish uchun buxgalteriyaga beriladi.

XULOSA

O‘tkazilgan adabiyot taxlillaridan xulosa qilib aytadigan bo‘lsak tayyorlov punkti laboratoriyasi tahlillarining natijalari topshiruvchi hamda paxtani qabul qiluvchi klassifikator uchun majburiy ma’lumot hisoblanadi. Agar topshiruvchi klassifikator tomonidan aniqlangan paxtaning navi, namligi va iflosligiga rozi bo‘lmasa, bahs tayyorlov punktining laboratoriyasi tomonidan xal etiladi, buning uchun ular ishtirokida tayyorlov punkti laboratoriyasining vakili paxta sifatini asboblar bilan sinash uchun o‘rta namuna tanlaydi.

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AYLANMA HARAKAT DINAMIKASIDAN MASALALAR YECHISH METODIKASI

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ANNOTATSIYA

Ushbu maqolada aylanma harakat dinamikasiga doir uchta masalaning yechish metodikasi keltirilgan. Shuningdek, masala yechish uchun o‘quvchilarga zarur metodik tavsiyalar berilgan. Masalalarning tahlili va sintezi keltirilgan.

Kalit so‘zlar: *masala, analitik metod, sintetik metod, tahlil, sintez, sterjen, sfera, sharsimon jism, tezlik, tezlanish.*

METHODOLOGY FOR SOLVING PROBLEMS IN ROTATIONAL MOTION DYNAMICS

ABSTRACT

This article presents the solution methodology for three problems related to the dynamics of rotational motion. Additionally, essential methodological recommendations are provided for students to solve the problems. The analysis and synthesis of the problems are also included.

Key words: *problem, analytical method, synthetic method, analysis, synthesis, stern, sphere, spherical body, speed, acceleration.*

KIRISH

Masala yechish-kichik hodisa va jarayondagi noma’lum fizik kattaliklarni masala shartida berilgan kattaliklar orqali ifodalangan formulasini chiqarib masala shartida berilgan kattaliklarning son qiymatini o‘rniga qo‘yib hisoblashdir. Fizika o‘qitishda amaliy metodlar ichida masalalar yechish muhim o‘rin egallaydi. Masalalar yechishda qo‘yiladigan asosiy maqsad o‘quvchilar fizik qonuniyatlarni chuqurroq tushunsinlar, ularni ajrata olsinlar va ularni fizik hodisalarni tahlil qilishga, amaliy masalalarga qo‘llay olishga o‘rganishlaridan iborat[1].

Fizikadan masala yechishda o‘quvchilar quyidagi qisqacha metodik ko‘rsatmaga amal qiladilar:

1. Masalaning sharti bir necha marta o‘qib chiqiladi va u fizikaning qaysi bo‘limiga tegishli ekani aniqlandi.

2 Masalaning qaysi bo‘limga tegishliligi anglanadi, mazmuni tushuniladi va masala shartida berilgan kattaliklar „XBS” da ifodalanib, topish kerak bo‘lgan kattalik yoziladi.

3. Masalaning shartiga mos keluvchi chizma chiziladi.

4. Masala shartida qanday fizik qonuniyatlar yotgani aniqlanadi.

5. Masalani umumiy ko‘rinishda yechish uchun ketma-ketlik asosida masala shartidagi noma’lum kattalikni ma’lum kattaliklar bilan bog‘lovchi formulalar hosil qilinadi.

6. Masala yechishda qo‘llanilgan har bir qonun, qoida, formula va fizik kattaliklar qisqacha izohlab boriladi.

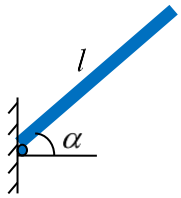
7. Masala shartiga berilgan kattaliklar aniqlangan formulaga qo‘yiladi va hisoblanadi.

8. Masalaning javobini chiqarishda uning aniqligiga ahamiyat beriladi va kerakli xulosalalar chiqariladi.

ASOSIY QISM

Aylanma harakat dinamikasidan quyidagi 3 ta maslaning yechish metodikasini keltiramiz:

1.Bir uchi biriktirilgan sterjen gorizontga nisbatan α burchakda ushlab turilibdi. U qo‘yib yuborilgan momentda qanday burchak tezlanish oladi.

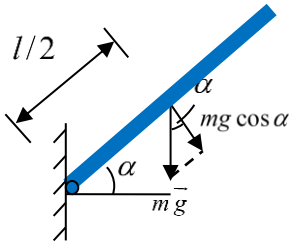


1-rasm

Berilgan: m, l. Topish kerak : $\varepsilon = ?$

Yechilishi: Aylanma harakat dinamikasining asosiy qonunidan:

$$M = I \cdot \varepsilon \qquad (1)$$



2-rasm

Bu yerda aylantiruvchi kuch moment quyidagiga teng:

$$M = mg\cos\alpha \cdot \frac{l}{2} \qquad (2)$$

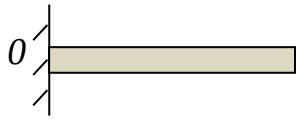
Sterjenning aylanish o‘qi nisbatan inertsiya moment:

$$I = \frac{ml^2}{3}$$

(1), (2) va (3) lardan quyidagilarga ega bolamiz:

$$mg\cos\alpha \cdot \frac{l}{2} = \frac{ml^2}{3} \cdot \varepsilon \quad \text{bundan} \quad \varepsilon = \frac{6g}{l}\cos\alpha$$

2. Erkin siljiy oladigan sterjen qo‘yib yuborilgan momentda chap uchi biriktirilgan 0 nuqtaga qanday kuch bilan ta’sir etadi?

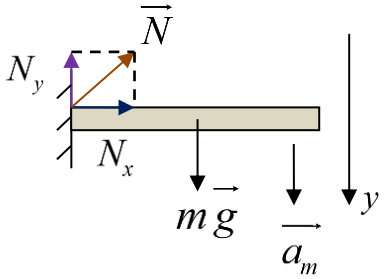


3-rasm

Berilgan: l, Topish kerak: $N = ?$

Yechilishi: y o‘qi bo‘yicha Nyutonning 2- qonunidan quyidagini yoza olamiz:

$$mg - N_y = ma_m \qquad (1)$$



4-rasm

a_m-massa markazi tezlanishi

$$a_m = \varepsilon \cdot \frac{l}{2} \qquad (2)$$

Aylanma harakat dinamikasining asosiy qonunidan

$$M = I\varepsilon \qquad (3)$$

Bu yerda aylantiruvchi kuch moment quyidagiga teng:

$$M = mg\frac{l}{2} \qquad 4)$$

Sterjenning aylanish o‘qi nisbatan inertsiya moment:

$$I = \frac{ml^2}{3} \qquad (5)$$

(3), (4) va (5) lardan quyidagiga ega bo‘lamiz: $mg\frac{l}{2}=\frac{ml^2}{3}\varepsilon$ (6)

$$\varepsilon=\frac{3g}{2l} \quad (7)$$

(1), (2) va (7) lardan quyidagilarga ega bo‘lamiz:

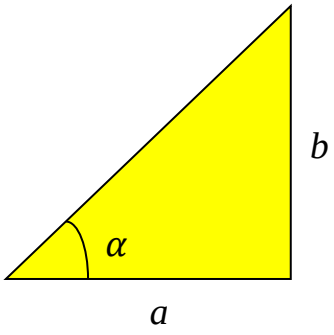
$a_m=\frac{3g}{2l}\cdot\frac{l}{2}=\frac{3g}{4}$ $mg-N_y=m\cdot\frac{3g}{4}$ $N_y=\frac{mg}{4}$

Harakat boshlangan momentda $N_y=0$ - gorizontal kuch mavjud bo‘lmaydi.

Rasmda ko‘rinib turibdiki kuchlarning tashkil etuvchisi: $N=\sqrt{N_x^{\,2}+N_y^{\,2}}=\frac{mg}{4}$

Javob: $N=\frac{mg}{4}$

3. Tomonlari a va b bo‘lgan to‘g‘ri burchakli uchburchak shaklidagi bir jinsli plastinkaning b tomonidan o‘tgan o‘qqa nisbatan inertsiya momentini toping. Plastinkaning massasi m ga teng.



I.7.3-rasm

Yechilishi: Uchburchakning kichik dr qismini ajratib olamiz, bu qismning masasini:

$$dm=\rho ds_1 l \quad (1)$$

dS_1-shtrixlangan sohaning yuzasi. l - plastinaning qalinligi va ρ - zichligi. Plastinaning umumiy massasi

$$m=\rho S l \quad (2)$$

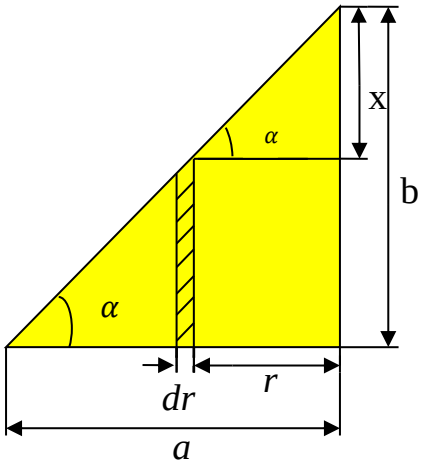
plastinaning yuzasi esa $S=\frac{ab}{2}$ (3)

(2) va (3)larni (1) ga qo‘yib quyidagiga ega bo‘lamiz:

$$dm=2m\frac{ds_1}{ab} \quad (4)$$

U holda uchburchakning kichik dr qismining inertsiya momentini quyidagicha yoza olamiz: $I=\int_0^m r^2 dm$ (5)

Rasmdan ko‘rinib turibdi: $\frac{x}{r} = tg\alpha$ bundan $x = rtg\alpha$ (6)



I.7.3(a)-rasm

Uchburchakning ajratib olingan kichik dr qismini to‘rtburchak shakl deb olamiz, uning yuzasi quyidagiga teng:

$$ds_1 = dr(b - x) \quad (7)$$

(6) ni (7) qo‘yib quyidagiga ega bo‘lamiz:

$$ds_1 = dr(b - rtg\alpha) \quad (8)$$

(8) ni (4) qo‘yib quyidagiga ega bo‘lamiz: $dm = 2m\frac{(b - rtg\alpha)dr}{ab}$ (9)

(9) ni (5) ga qo‘yib uchburchak shaklidagi bir jinsli plastinkaning b tomonidan o‘tgan o‘qqa nisbatan inertsiya momentini hisoblaymiz:

$$I = \int_0^m r^2 dm = \int_0^a r^2 \cdot 2m\frac{(b - rtg\alpha)dr}{ab} = \frac{2m}{ab}\int_0^a r^2(b - rtg\alpha)dr$$

$$I = \frac{2m}{ab}\left[\frac{r^3 b}{3} - \frac{r^4}{4}tg\alpha\right]_0^a = 2ma^2\left(\frac{1}{3} - \frac{a}{4b}tg\alpha\right)$$

Javob: $I = 2ma^2\left(\frac{1}{3} - \frac{a}{4b}tg\alpha\right)$

XULOSA

Masalalar yechishda, ayniqsa yuqori sinf o‘quvchilar analitik usuldan foydalanish samaraladir, chunki bu usul ularning mantiqiy fikrlashning rivojlanishiga yordam beradi. Masalalarni yechishda analiz yoki sintezni bir biridan ajratish qiyin, ular hamma vaqt o‘zaro bog‘langan holda keladi.

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INNOVATIVE APPROACH TO ANALYSISBONE STRENGTH: RADIOFREQUENCY ECHOGRAPHIC MULTISPECTROMETRY

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Relevance. *This review presents information on radiofrequency echographic multispectrometry (REMS), a new ultrasound method that allows assessing bone strength. This method is especially effective in examining the lumbar spine and proximal femur. REMS results demonstrate a high correlation with axial dual-energy X-ray absorptiometry data, which is considered the gold standard in assessing bone density. However, REMS is safer because it does not use ionizing radiation. In addition, this method allows determining not only the density, but also the quality of bone tissue, which makes it more complete and informative. In the near future, publications are expected on the assessment of bone fragility using the new REMS parameter, which does not depend on mineral density. This will allow more accurate diagnosis of bone tissue condition and the development of effective measures to prevent osteoporosis.*

KEYWORDS: *osteoporosis, bone density, echographic multispectrometry, femoral neck, REMS.*

Introduction. Osteoporosis is a systemic metabolic disease of the skeletal system, which is characterized by a decrease in bone strength and leads to fractures even with minor injuries. The only clinical manifestation of osteoporosis is low-energy bone fractures, such as fractures of the vertebral bodies, proximal femur, distal forearm, proximal humerus and other bones. It is these fractures that determine the medical, social and economic significance of osteoporosis for modern society.

Bone strength is characterized by two key parameters: density (or mass) and microarchitecture [1]. To determine bone fragility, both of these parameters must be examined. However, most instrumental methods for examining bone tissue focus on

assessing bone density, which is the main risk factor for fractures. The gold standard in this area is dual-energy X-ray absorptiometry (DXA).

Dual-energy X-ray absorptiometry

DXA isa densitometry method based on the absorption of X-ray photons by calcium ions. This process allows us to determine the calcium content in bone tissue and calculate the projected bone mineral density (BMD), expressed in grams per square centimeter. The use of two levels of X-ray energy provides an accurate measurement of BMD, regardless of the thickness of soft tissues. According to the recommendations of the World Health Organization, the diagnosis of osteoporosis is established on the basis of the T-score, which is expressed in standard deviations (SD) of BMD from the norm. The norm is taken as the reference value in the control population of young healthy premenopausal women aged 20 to 40 years. Osteoporosis is diagnosed with a T-score of -2.5 SD or more. If the T-score is in the range from -1.0 to -2.5 SD, the diagnosis of osteopenia is established. A value exceeding -1.0 SD is considered normal.

The preferred areas for DXA densitometry are the proximal femur and lumbar spine, which corresponds to axial or central densitometry. Densitometry allows for the most accurate determination of fracture risk in the areas under study, and fractures of the vertebral bodies and proximal femur are the most severe manifestations of osteoporosis. As mentioned earlier, DXA is currently recognized as the gold standard for diagnosing osteoporosis and predicting the risk of low-energy fractures. Due to the high accuracy and reproducibility of the results, DXA can also be used to assess the dynamics of bone mineral density during treatment. This diagnostic method is included in international and domestic clinical guidelines for osteoporosis. The introduction of the DXA method into clinical practice faces a number of obstacles. In accordance with the recommendations of international organizations, to ensure the proper level of public service, it is necessary to have one DXA device for every 11 thousand people. In the Russian Federation in 2010, this figure was only 0.6 devices per 1 million people. This is due not only to the high cost of the equipment, but also to the need to create specialized premises for its placement. In addition, it is necessary to take into account the importance of the correct position of the patient during the study, as well as the high qualifications of the specialist conducting densitometry and interpreting the results. A certain subjectivity inherent in human perception can become a source of errors in the process of conducting the study. As is known, fractures can occur not only in people with low bone mineral density (BMD), but also in patients with osteopenia or normal BMD. This is due to the fact that in addition to bone density, its elastic properties and microstructural parameters are of great importance, which cannot be determined using modern densitometers. In this regard, DXA (dual-energy X-ray absorptiometry) has high specificity, but low sensitivity in identifying people with a

high risk of fractures. This creates a need to search for new technologies that would have similar or better performance in identifying high fracture risk, but would not have the disadvantages of DXA.

Quantitative ultrasound examination of bone tissue

Quantitative ultrasound examination of bone tissue (QUS) has been proposed as an alternative to X-ray densitometry. This diagnostic method does not require the use of ionizing radiation, which makes it safer for the patient. In addition, QUS equipment is significantly cheaper and more portable, which allows the study to be carried out anywhere, without the need for specialized premises and the involvement of highly qualified specialists. However, unlike DXA, QUS allows only peripheral areas of the skeleton to be examined. This limits the capabilities of the method and often leads to discrepancies in the results with the data obtained using DXA. The only area of the skeleton for which QUS has been proven to be able to predict the risk of fractures is the calcaneus. QUS of the calcaneus can identify the risk of low-energy fractures in patients over 65 years of age. In combination with clinical risk factors for osteoporosis, QUS can identify individuals with very low fracture risk who do not require further osteoporosis testing. Thus, quantitative bone ultrasound (QUS) is primarily intended for screening or initiating treatment for osteoporosis when DXA is not available. QUS cannot be used to monitor treatment efficacy due to the lack of large randomized trials and the ambiguity of published data [13]. Although, as noted above, peripheral skeletal QUS results usually do not coincide with central DXA data, some correlation of measurements is observed when the skeletal site is scanned at the same time as DXA densitometry [14]. This fact has led a group of Italian scientists to develop a new technology called Radio Frequency Echographic Multi-Spectrometry (REMS).

Radiofrequency echographic multispectrometry is an innovative technology based on the analysis of native, unprocessed and unfiltered ultrasound signals generated during echographic scanning of the lumbar vertebrae and/or proximal femur.

This methodallows you to obtain the maximum amount of information about the condition of the tissues being examined (Fig. 1). Unlike other methods of ultrasound examination of bone tissue, REMS is not limited to determining one or several parameters, but compares the spectrum of the analyzed signals with reference spectral models corresponding to certain pathological conditions, such as osteoporosis and osteopenia, as well as with the norm.

During the procedureThe REMS sensor is placed in the abdominal area in the projection of the lumbar vertebrae or on the proximal femur, which allows visualization of the skeletal areas of interest.

The operator sets the parameters for scanning depth and focus, after which the program automatically detects the bone and identifies the region of interest (ROI).

Raw signals from multiple scan lines are processed in parallel, each line producing one spectrum. A combined B-mode image analysis is then performed, allowing the target bone and associated ROIs to be identified.

Thus, REMS technology analyzes the full spectrum of radiofrequency signals obtained during ultrasound scanning of the lumbar vertebrae and femoral neck, which allows determining the architecture of the bone.

Spectral analysis of each scan line provides the ability to automatically exclude any artifacts such as calcifications or osteophytes by identifying spectral characteristics not directly related to bone tissue.

The obtained data are integrated into a signal spectrum specific to the examined bone of each examined patient. This signal spectrum is then compared with reference spectral models corresponding to gender, age, body mass index and examination localization, which were created on the basis of an extensive database.

The most importantBone health indicators that are directly relevant to the diagnosis of osteoporosis and prediction of fracture risk include low bone mineral density (BMD) and high fracture risk.

ININ this regard, two new diagnostic parameters were developed to analyze the results of the REMS study: Osteoporosis Score (OS) and Fragility Score (FS).

OS allows us to assess the degree of similarity of the spectrum of the subject with the spectral models of patients with low (T-criterion $\leq$ -2.5 SD) and normal (T-criterion $\geq$ -1.0 SD) bone mineral density.

FS allows quantitative assessment of the similarity of the spectrum with patterns obtained in patients who recently suffered a low-energy fracture or who had no history of fractures.

Essentially, the OS system determines the percentage of bone areas analyzed that have been classified as osteoporotic as a result of scanning and sophisticated spectral analysis.

Thus, the analysis of radiofrequency signals obtained during echographic scanning of the target bone and a detailed comparison with reference spectral models make it possible to determine the correspondence of the internal architecture of the bone to the model of osteoporotic, osteopenic or healthy bone.

OS is then converted into MICREMS values for each vertebra/femoral neck using linear regression equations. Through quantitative comparisons with the NHANES database reference curves, MICREMS, like MICDXA, is expressed as T- and Z-scores.

The output parameter is the MPCREMS, a diagnostic index that has demonstrated a significant correlation with the corresponding MPC values obtained by DXA densitometry [15, 16].

FS is a bone fragility index that is an independent indicator of bone quality and allows one to assess the risk of fracture independently of bone mineral density (BMD).

FS is expressed as a numerical value ranging from zero to one hundred and is determined by comparing the signal spectrum of a particular patient with reference spectral models obtained in individuals with or without low-energy fractures.

RecentStudies have shown high accuracy of FS in differentiating patients with and without fractures. In addition, FS statistically significantly correlates with the 10-year probability of osteoporotic fracture calculated using the FRAX (Fracture Risk Assessment Tool) taking into account hip BMD.

Methodologyconducting

As we have already noted, to examine the spine, the ultrasound probe is placed in a transabdominal position under the sternum to visualize the L1 vertebra. Then, while monitoring the image on the screen, the probe is moved down to the L4 vertebra. It is necessary to scan at least two vertebrae. Scanning each vertebra takes about 20 seconds, after which the data is automatically processed within one to two minutes.

When examining the proximal femur, the ultrasound probe is positioned parallel to the femoral head-neck axis to visualize this area. The scan takes about 40 seconds, after which the data is automatically analyzed within one minute.

To obtain reliable information, specific parameters of sensor focus and scanning depth are set for each patient.

It followsIt should be noted that REMS automatically determines whether the obtained signal spectrum corresponds to the spectral model of trabecular bone. If the result is negative, visualization will not be performed and the operator will need to repeat the procedure.

The effectiveness of the clinical trials was assessedApplication of REMS in the diagnosis of osteoporosis.

ININ a single-center study involving 342 women aged 51 to 60 years, simultaneous DXA densitometry and abdominal REMS ultrasound scanning of the lumbar spine were performed.

For data analysis, patients were divided into two groups: one group was used to construct an ultrasound spectral model, and the second was used to evaluate the reproducibility and diagnostic accuracy of the constructed model.

This study was the first to use a fully automated algorithm developed by the authors, which performs a series of spectral and statistical analyses. As a result, a new diagnostic parameter OS was developed.

OS, like DXA, classifies patients into the categories of “osteoporosis”, “osteopenia” and “normal” in 91.1% of cases ($\kappa = 0.859$, $p < 0.0001$). MICREMS

calculated on the basis of OS significantly correlates with MICDXA ($r = 0.84$, $p < 0.001$).

Another single-center study of 377 women aged 61 to 70 years used REMS and DXA methods for hip examination. The results showed a high concordance rate between these methods, amounting to 94.7%. In addition, differences in BMD values were found between postmenopausal and premenopausal women.

The study was continued as part of a multicenter project,which involved 1914 postmenopausal women aged 51 to 70 years (2018). This was a cross-sectional observational study in which all participants underwent DXA densitometry of the spine and proximal femur simultaneously with echographic scanning of the same skeletal areas using REMS.

The researchers conductedA comparative analysis of the short-term inter- and intra-operator reproducibility and diagnostic accuracy of REMS and DXA. As a result, after excluding patients with erroneous REMS (280 spine and 205 femur) and DXA (78 spine and 59 femur) findings, REMS demonstrated a high ability to differentiate patients with osteoporosis.

INIn particular, in the spine, the sensitivity of REMS was 91.7% and the specificity was 92.0%. In the femoral neck, these figures were 91.5% and 91.8%, respectively. The results of the study were confirmed by the high degree of agreement between the data obtained using the REMS method and the results obtained using the DXA method. The correlation coefficient for the spine was 0.94 ($p < 0.001$), and for the femur - 0.93 ($p < 0.001$).

Linear regression also confirmed a high degree of correlation between the data obtained using both methods. The correlation coefficient for the spine was 0.95, and for the hip it was 0.97 (Fig. 2).

The reproducibility of the results obtained using the REMS method was assessed using the root mean square coefficient of variation. This indicator was quite high and amounted to 0.38% for the spine (95% confidence interval (CI) 0.28–0.48) and 0.32% for the femoral neck (95% CI 0.24–0.40).

For comparison, inIn another study involving patients with similar characteristics, reproducibility rates for results obtained using DXA ranged from 1.07 to 1.47%.

When dividing patients into three groups: osteoporosis, osteopenia and normal, the diagnostic concordance of the DXA and REMS methods was 88.8% for the spine and 88.2% for the femoral neck.

HoweverA large number of cases of misclassification of results were associated with bone mineral density (BMD) values close to each other and to the cut-off value.

For example, the patient's T-criterion according to the results of DXA densitometry was -2.5 SD, and according to REMS - -2.4 SD. At the same time, according to DXA

she was diagnosed with osteoporosis, and according to REMS - osteopenia, although the indicators were very close.

If we assume a tolerance of the T-criterion according to REMS of 0.3 SD, then the diagnostic concordance of the two methods will be higher and will amount to 97.4% for the spine and 98.0% for the femoral neck.

The study found a significant proportion of erroneous scans when using the REMS method. In particular, for the spine, this figure was 18.0%, and for the hip, 12.5%.

The greatestThe number of errors was recorded in the first three to four months of the study, but with the accumulation of experience their number decreased.

The errors were related to incorrect selection of scanning depth and focus.

A separate assessment was conducted as part of the studygroup of patients in which erroneous scans using REMS and DXA methods were not excluded. In this situation, the sensitivity of REMS decreased to 81.0% for the spine and to 81.7% for the femoral neck, while maintaining a high specificity of 84.3% and 89.7%, respectively.

The agreement of the results was 76.4% for the spine and 81.9% for the femoral neck.

ThisA multicenter study demonstrated high sensitivity and specificity of the REMS method in identifying patients with osteoporosis. In addition, the REMS results are in good agreement with the data obtained using DXA.

The study authors concluded that the REMS results were accurate and reproducible, making it a recommended method for diagnosing osteoporosis. However, they stressed the need for careful operator training to prevent potential errors.

The researchers also suggested that in the future, additional software could be developed that could automatically determine the correct sensor focus and scanning depth, which would improve the accuracy and reliability of the REMS method.

ForEach patient must be scanned.

It should be noted that in addition to the high probability of incorrect scanning, there are other limitations of this study. These include its cross-sectional design and its conduct within a single country.

To draw valid conclusions about the capabilities of REMS, prospective studies are needed to assess how effectively REMS can predict fracture risk and monitor bone health dynamics during treatment.

The Echo-Bone multicenter study is currently underway in five European centers. This study compares REMS with DXA (dual-energy X-ray absorptiometry).

In addition, studies should be conducted that include men and people of other races, besides Caucasians. REMS technology may also be useful for children and pregnant women. In the future, it will be possible to evaluate the condition of muscle tissue and cartilage.

The REMS method has received official approval from a number of international organizations. In October 2018, the US Food and Drug Administration (FDA) approved the use of this technology.

This device is recommended for the diagnosis of osteoporosis using such indicators as bone mineral density (BMD), T- and Z-scores. In addition, it helps to determine the risk of fractures by assessing the ten-year risk according to the FRAX scale.

The study found a high correlation between bone mineral density (BMD) determined by the REMS method, which is based on ultrasound measurements of the lumbar spine and femoral neck, and BMD measured by DXA in the same areas.

Since the accuracy of REMS is comparable to that of DXA, this method can be used to monitor changes in bone tissue in women. In 2019, the European Society for Clinical and Economic Aspects also recognized the REMS method as an effective tool for diagnosing osteoporosis.

As part of a consensus meeting of experts organised by the European Association for the Study ofOsteoporosis, Osteoarthritis and Other Musculoskeletal Disorders (ESCEO) adopted a resolution emphasizing the importance of REMS as the first clinically proven method for directly measuring bone mineral density (BMD) in the lumbar spine and femoral neck without the use of ionizing radiation.

REMS is an innovative non-invasivea method for assessing bone tissue that is free from the shortcomings of X-ray densitometry and allows one to obtain important integral indicators of fracture risk, such as bone density and quality.

Thanks to its safety and portability, REMS has the potential for widespread implementation in clinical practice, especially in primary care and in cases where patient transportation to the densitometry room is difficult.

As part of the diagnosis of osteoporosis, the results were obtained, which are consistent with data obtained using DXA in the same skeletal regions, such as the lumbar spine and femoral neck.

In the future, publications are expected on the assessment of bone fragility using another REMS parameter that is independent of BMD – the bone fragility index (FS).

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QANDLI DIABETI BOR BO‘LGAN PARAPROTEZLI QAYTALANUVCHI VENTRAL CHURRALARINING SABABLARI VA XIRURGIK DAVOLASH USULINI TANLASH

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Rezyume. *Qandli diabeti bor bo‘lgan operatsiyadan keyingi ventral churra bilan og‘rigan 78 bemorni davolash tahlili o‘tkazildi. Surunkali qorin churrasi bo‘lgan bemorlarda kasallikning klinik ko‘rinishi hamroh kasalliklari (shu jumladan qandli diabet, semirish, o‘pkaning surunkali obstruktiv kasalligi O‘SOK va boshqalar)ga, oldingi gernioplastika texnikasiga bog‘liq edi. Protezli taranglashgan gernioplastikadan so‘ng kasallikning to‘liq qaytalanishi ko‘pincha rivojlanadi. Plastik jarrohlikning taranglashmagan protezlash usuli protezning to‘qimalarga mahkamlanishining pastki va yuqori konturlari bo‘ylab churralarning qisman qaytalanishi, shuningdek, shikastlangan protezning nuqsonlari orqali churralar paydo bo‘lishi bilan tavsiflanadi. Qandli diabet bilan dispenser nazoratida turadigan bemorlarda qonda qand miqdorining normadan doimiy baland bo‘lishi, to‘qimaning regeneratsiya jarayoniga salbiy ta’sir etadi. Bu esa o‘z navbatida jarohatga infektsiya tushishi va uning ko‘payishini, jarohatning yiringlashiga olib keladi. Choklar bu holatda teri, teriosti yog‘ to‘qimasi, protez, mushak va aponevroz o‘rtasida mustahkamlikni yo‘qotadi, protez va to‘qima orasida tirqish paydo qiladi, bu tirqish orqali qorin bo‘shlig‘i a’zolari teri ostiga chiqib qoladi, bu jarayon esa churraning qaytalanishiga olib keladi. Bemorlarda tarang protezlash usullaridan so‘ng, sintetik protez atrofida bo‘shliqlar paydo bo‘lishi bilan biriktiruvchi to‘qima rivojlanadi, bu protezning tolalari atrofida yallig‘lanish reaktsiyasiga olib keladi; plastik jarrohlikning taranglashmagan kombinatsiyalangan usullaridan so‘ng - tolali transformatsiya belgilari, diffuz o‘choqli lipomatoz va o‘rtacha limfotsitar infiltratsiya belgilari bilan yetuk biriktiruvchi to‘qima hosil bo‘ladi. Yuqoridagi omillar qorin bo‘shlig‘i bosimining oshishi bilan birgalikda qaytalanuvchi churra shakllanishiga asos bo‘ladi.*

Kalit so‘zlar. *Qandli diabet, giperglikemiya, qondagi glyukoza miqdorini korrektsiyalash, operatsiyadan keyingi ventral churra, protezli plastika, qaytalanish.*

Dolzarblik. Qandli diabeti bor bo‘lgan operatsiyadan keyingi ventral churra bilan og‘rigan bemorlarni davolash natijalarining yaxshilanishi turli materiallardan tayyorlangan sintetik protezlarning amaliyotga joriy etilishi bilan bog‘liq. Ventral churralarning autoplastik usullar yordamida tuzatilgandan keyin qaytalanish darajasi 20 dan 46% gacha, protezlash usullaridan keyin bemorlarning 8 dan 15,3% gacha (1,3,4). Hozirgi vaqtda retsidiv churralarning patogenezi protez atrofidagi to‘qimalarda doimiy progressiv mahalliy yallig‘lanish jarayonining rivojlanishi nuqtai nazaridan ko‘rib chiqiladi, bu takroriy operatsiyalar paytida yaraning asoratlari xavfi ortishidan dalolat beradi (2,6). Biroq, kasallikning asoratlari va qaytalanishining oldini olish usullari yetarli darajada ishlab chiqilmagan (5).

Gernioplastikaning autoplastik va protez usullaridan keyin retsidiv ventral churrasi bo‘lgan bemorlarda jarrohlik usulini tanlash bo‘yicha aniq shakllangan tavsiyalarning yo‘qligi ushbu tadqiqotni o‘tkazish uchun asosiy turtki bo‘ldi.

Tadqiqot maqsadi. Turli xil plastik jarrohlik usullaridan so‘ng retsidiv qorin churrasi bilan og‘rigan bemorlarda to‘qimalarda makro- va mikroskopik morfologik o‘zgarishlarni qiyosiy tahlil qilish va qorin devorining retsidiv churralarini jarrohlik davolash usullarini takomillashtirish va qondagi qand miqdorini korrektsiyalash orqali regeneratsiya jarayonini optimallashtirish.

Materiallar va usullar. Operatsiyadan keyingi retsidiv qorin churrasi bo‘lgan 28 yoshdan 75 yoshgacha bo‘lgan (o‘rtacha yoshi 57,2±9,02 yosh) barcha 78 nafar bemor 2 guruhga bo‘lingan. I guruhga churra alloplastikasining kuchlanish usullaridan keyin retsidiv churra paydo bo‘lgan 52 bemor kiritilgan. II guruhga sintetik protezlardan foydalangan holda kuchlanishsiz kombinatsiyalangan usullardan foydalangan holda operatsiyalardan so‘ng kasallikning qaytalanishi sodir bo‘lgan 26 bemor kiritilgan.

Ko‘pincha ginekologik operatsiyalardan keyin hosil bo‘lgan churralar - 23,2%, boshqa kasalliklar, shu jumladan qorin bo‘shlig‘i travmasi - 22,1%, gepatobiliar tizimga aralashuvlar 16,2% va kindik churrasi uchun churra tuzatish - 15,1% va boshqalar.

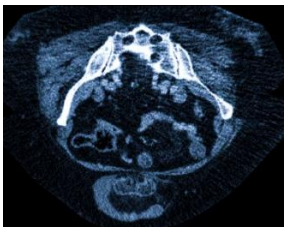
J.P. Chevrel va A.M. Rath (SWR - tasnifi 2000) tasnifi bo‘yicha bemorlarning o‘lchami, joylashuvi va retsidiv churralarning chastotasi bo‘yicha taqsimlanishi.

Shu bilan birga, muhim o‘rinni o‘rtacha lokalizatsiya churrasi (87,2%), keyin esa - anterolateral churrasi (8,1%) va lateral churrasi (4,7%) egalladi.

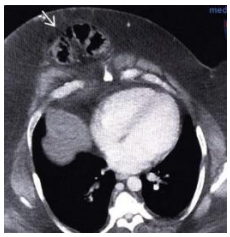
Kichik o‘lchamdagi (W1) retsidiv churralar bemorlarning 18,6% da, o‘rta (W2) - 34,9%, katta (W3) - 31,4%, gigant (W4) - 15,1%.

Instrumental tadqiqot usullarini ro‘yxatdan o‘tkazishga alohida ahamiyat berildi: operatsiyadan oldin va keyin aralashuv sohasidagi ultratovush, KT.

OKVCh bilan og‘rigan bemorlarda kompyuter tomografiyasi churra protruziyasining proektsiyasidagi nuqsonni, uning o‘lchamini ishonchli tarzda ko‘rishga, churra tarkibidagi elementlarni aniqlashga, teri osti yog‘ining qorin old devori qalinligini va mushak aponevrozining holatini aniqlashga imkon berdi.



1-rasm. Operatsiyadan keyingi retsidiv qorin churrasi (M2W3R1) bilan og‘rigan 56 yoshli bemor P.ning qorin old devorining ko‘rinishi va kompyuter tomografiyasi.



2-rasm. Operatsiyadan keyingi retsidiv qorin churrasi (L1W3R2) bilan og‘rigan 54 yoshli bemor G.ning qorin old devori ko‘rinishi va kompyuter tomografiyasi.

Operatiya paytida retsidiv churrasi bo‘lgan bemorlarda morfologik tadqiqot uchun, ilgari o‘rnatilgan protezning bo‘laklari, churra teshigi sohasidagi to‘qimalar to‘g‘ridan-to‘g‘ri retsidiv churra joyida va ulardan 5-15 sm masofada (birlamchi churraning o‘lchami belgilangan holda aniqlanadi) suyuqlik hosil bo‘lishining devorlari va ularning mavjudligi olingan.

Protezlash usullaridan so‘ng retsidiv churra bilan og‘rigan bemorlarda plastik zonani o‘rab turgan to‘qimalar, shuningdek takroriy operatsiyalar paytida olingan protez-to‘qima interfeysi o‘rganildi. Gistologik bo‘limlar Samqand davlat tibbiyot universitetining gistologiya kafedrasida Olympus BX 41 mikroskopiga asoslangan vizualizatsiya tizimidan foydalangan holda o‘rganildi, Morfologiya 5.2 dasturi yordamida tasvirlar olingandan so‘ng tuzilmalarning morfometriyasi amalga oshirildi.

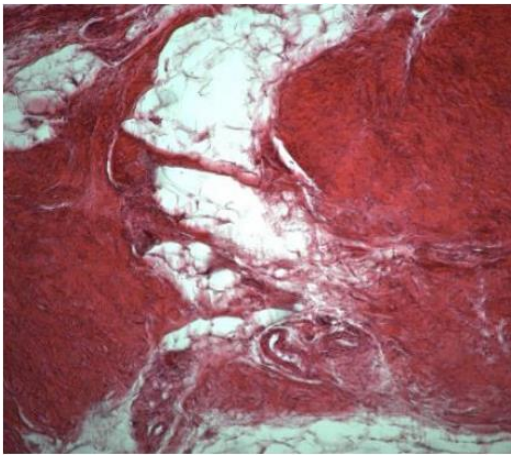
Qorin devoridagi nuqsonlarni mahalliy to‘qimalar bilan plastik yopib, ularni sintetik protez bilan mustahkamlagandan so‘ng bemorlarda churraning qaytalanishi sabablarini aniqlash uchun davolangan bemorlarda operatsiyalarning retrospektiv tahlili o‘tkazildi.

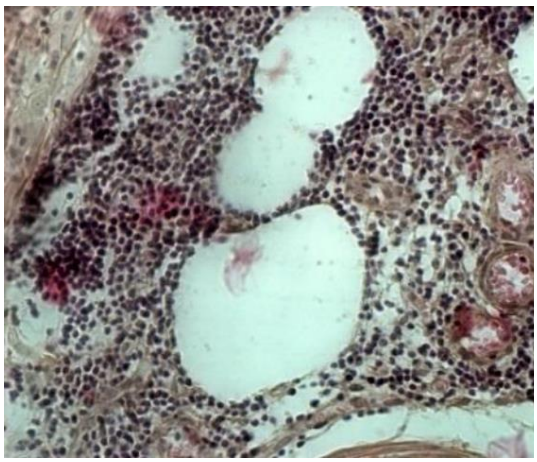
Mahalliy to‘qimalar bilan plastika qilinganidan keyin retsidiv churrasi bo‘lgan bemorlarda kasallikning to‘liq qaytalanishi sodir bo‘ldi. Operatsiya paytida, ilgari tikilgan to‘qimalarning qirralari ajralish chizig‘i bo‘ylab, ip va tugunning yaxlitligi saqlanib qolgan ligaturalar topildi, bu ipning yorilishi emas, balki to‘qimalarning otilishidan dalolat beradi. Mahalliy to‘qimalar bilan plastik jarrohlikdan so‘ng,

churraning takrorlanishi va protrusion hajmi o‘rtasida bog‘liqlik qayd etildi, bu esa, o‘z navbatida, operatsiyadan keyin qorin bo‘shlig‘i bosimining oshishi bilan bog‘liq. Bu qorin bo‘shlig‘i bosimining oshishiga hissa qo‘shadigan katta churralarni tuzatishning qo‘llaniladigan usulining etarli emasligini ko‘rsatadi.

Ushbu guruhdagi bemorlarda mahalliy to‘qimalar bilan plastik jarrohlikdan so‘ng to‘qimalarning mikroskopik tadqiqotlari shuni ko‘rsatdiki, chandiq bilan ifodalangan retsidiv zonasi churra elementlarini shakllantirish jarayonida qorin old devorining anatomiyasini o‘zgartirib, operatsiya davomida texnik qiyinchiliklarni keltirib chiqardi. 2 oydan 6 oygacha qaytgan taqdirda, chandiqning asosini tolali transformatsiya belgilarisiz etuk biriktiruvchi to‘qima tashkil qiladi. Kollagen tolalari asosan to‘plamlarda to‘plangan, ammo ulardagi tolalarning qalinligi va zichligi notekis edi. Past zichlikli hududlarda to‘qimalarning shishishi va diffuz o‘choqli limfotsitar infiltratsiya bilan yallig‘lanish belgilari mavjud (3-rasm). Bunday o‘zgarishlar retsidiv zonasidan uzoq masofada kuzatilgan va churraning qaytalanishining rivojlanish joyida, mavjud yallig‘lanish fonida, pishmagan granulyatsiya to‘qimalarining kichik o‘choqlari mavjud edi.

Plastik jarrohlikning kuchlanish protez usullaridan so‘ng retsidiv churrasi bo‘lgan bemorlarda quyidagi o‘zgarishlar makroskopik tarzda aniqlandi. Asosiy farqlar, retsidiv vaqtiga qarab, to‘g‘ridan-to‘g‘ri implant joylashgan hududda kuzatildi, bu sintetik protez atrofidagi biriktiruvchi to‘qima kapsulasining etishmovchiligi va notekis shakllanishida namoyon bo‘ldi. Plastik jarrohlikdan 6 oy o‘tgach, sintetik material "on lay" holatiga qo‘yilganda, protezning patologik integratsiyasi, uning atrofida aylana kapsula deyarli yo‘qligi aniqlandi. U yallig‘lanish hujayralari bilan intensiv infiltratsiya qilingan granulyatsiya to‘qimalariga asoslangan bo‘lib, ularning aksariyati limfotsitlar, shuningdek, sintetik materialning to‘qimalari va tolalari o‘rtasida sezilarli "bo‘shliqlar" hosil qiluvchi bir nechta degranulyatsiyalangan mast hujayralari (5b-rasm). Protezning dumaloq kapsulasini tashkil etuvchi kollagen tolalari tolali transformatsiya belgilarini ko‘rsatdi. Shunday qilib, morfologik nuqtai nazardan, churra teshigini mahalliy to‘qimalar bilan yopish yoki protez taranglik usullari bilan mavjud bo‘lgan to‘qimalarning kuchlanishining belgisi surunkali aseptik yallig‘lanishdir, bu chandiqlarni qayta qurish jarayonlarini keltirib chiqaradi, chandiqlar o‘rtasida "bo‘shliqlar" paydo bo‘ladi. protez va to‘qimalarning tolalari, uning to‘qimalarga mahkamlash kuchini kamaytiradi.



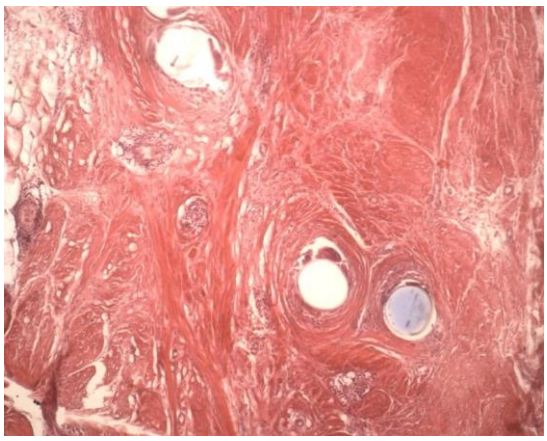


5-rasm. Ia (a), Ib (b) guruhidagi bemorlarda retsidiv zonasi to‘qimalarida mikroskopik o‘zgarishlar. Gematoksilin va eozin bilan bo‘yash: a - shish va yallig‘lanish belgilari bilan plastik jarrohlik joyida chandiqning lipomatozi (100 katt.); b - sintetik polipropilen protez tolalari atrofida aniq yallig‘lanish hodisalari (400 katt.);

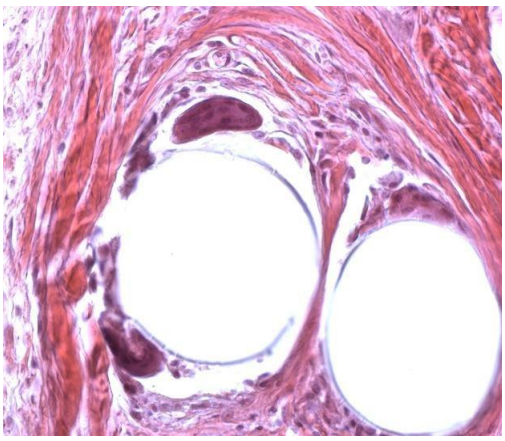
Taranglashmagan protezli kombinatsiyalangan plastik jarrohlikdan so‘ng retsidiv churrasi bo‘lgan bemorlarda jarrohlik amaliyotini o‘tkazishda va teri osti to‘qimasida terini kesishda to‘qimalarga birlashtirilgan protez aniq aniqlangan bo‘lib, o‘rta churrada qorin to‘g‘ri ichakning old devorlarini hosil qiladi. Joylashuvidan qat’iy nazar (epi-, mezo-, gipogastrik, shuningdek, anterolateral, lateral) retsidiv churralar 20 bemorda pastki, 4 bemorda inferolateral kontur bo‘ylab va 2 bemorda yuqori kontur bo‘ylab joylashgan. ta’mirlash. Shuning uchun yuqori yoki pastki kontur bo‘ylab churra teshigi protez bilan, pastki va yuqori kontur bo‘ylab - mos ravishda qorinning to‘g‘ri mushaklarining aponevrozi bilan ifodalangan va churra xaltasi ortiqcha cho‘zilgan qorin parda va gipertrofiyalangan ko‘ndalang fastsiyadan hosil bo‘lgan. 26 ta holatning hech birida churra xaltasida oldingi operatsiya vaqtida o‘rnatilgan protez bo‘lmagan. Protezni mahkamlash joyida churra teshigida tikuv materialini aniqlashning iloji bo‘lmadi, chunki bemorlarda operatsiya vaqtida so‘rilishi mumkin bo‘lgan tikuv materiali (vikril yoki poliglikolid) ishlatilgan.

Bundan tashqari, churraning kattaligi uning paydo bo‘lish vaqtiga bog‘liq edi. Davr qancha ko‘p bo‘lsa, churraning o‘lchami shunchalik katta bo‘lib, churra teshigi va churra xaltasi tufayli kattalashadi. Bundan tashqari, churra teshigi to‘qimalarning cho‘zilishi va yorilishi tufayli pastki kontur bo‘ylab kengayib, protezning sirpanib ketishiga olib keldi. Bu uning pastki va lateral konturlari bo‘ylab zich tolali halqa bilan tasdiqlanadi. Yuqori kontur bo‘ylab churra halqasi protezning chetida joylashgan bo‘lib, unda tolali to‘qimalar o‘smaydi.

Klinik kuzatishlar shuni ko‘rsatdiki, II guruh bemorlarida retsidivlar 6 oydan 1,5 yilgacha rivojlanadi. Operatsiya davomida barcha retsidiv churralar to‘liq bo‘lmaganligi va ko‘pincha protezni mahkamlashning pastki konturi bo‘ylab rivojlanganligi tasdiqlandi. Qaytarilish joylarining morfologik tadqiqotlari shuni ko‘rsatdiki, protez atrofida tolali transformatsiya va diffuz o‘choqli lipomatoz belgilari bo‘lgan etuk biriktiruvchi to‘qimaning qalin kapsulasi bor. Materialning tolalari bilan birinchi "o‘zaro ta’sir chizig‘i" yadrolari soni 18 dan 38 gacha bo‘lgan va gistologik bo‘limning faqat bitta tekisligida joylashgan begona jismlarning ulkan hujayralari edi. Granulyomatoz yallig‘lanish belgilari barcha kuzatuvlarda mavjud bo‘lgan, lekin tolalar bir-biriga bog‘langan joylarda eng aniq namoyon bo‘lgan, bu esa 263+44,5 mkm teskari tebranish mavjudligini aniqladi. Retsidivning bevosita maydoni limfotsitlar bilan o‘rtacha darajada infiltrlangan to‘liq qonli granulyatsiya to‘qimalari bilan ifodalangan (7, 8-rasm).



7-rasm. Mikrofotosurat. Sintetik protez joylashgan hududda retsidiv churra paytida to‘qimalarning holati. Bemor K. Tashxis: operatsiyadan keyingi qorincha churrasi MW4R2. Gematoksilin va eozin bilan bo‘yash. Katt. 100



8-rasm. Mikrofotosurat. Polipropilen protezning tolalari va atrofdagi granulyatsiya to‘qimalari dumaloq kapsulaning bir qismi sifatida begona jismlarning ulkan hujayralari bilan. Bemor L. Tashxis: operatsiyadan keyingi ventral churra MW3R1. Gematoksilin-eozin bilan bo‘yash. Katt. 400

Qayta tiklash joyidan uzoqda joylashgan hududlarda protez materialining tolalari bilan birinchi "o‘zaro ta’sir qiluvchi hujayralari" gistologik bo‘limning bir tekisligida 16 dan 28 gacha yadrolarni o‘z ichiga olgan ko‘p sonli gigant begona jismlar

hujayralari va asosiy tarkibni tashkil etdi. dumaloq kapsulalar ko‘plab yangi hosil bo‘lgan tomirlar, infiltrlangan yagona limfotsitlar va makrofaglardan iborat granulyatsiya to‘qimasi edi. Protez tolalari atrofidagi granulyatsiya to‘qimalarining qalinligi 263±44,5 mikronga yetdi.

Retsidiv churra hududidan olingan gistologik preparatlarda begona jismlarning gigant hujayralarining soni uzoq hududlardagi kabi bo‘lgan, ammo bitta kesma tekisligida ko‘rilgan yadrolar soni 20 dan 42 gacha bo‘lgan. protez materialining tolalari aniq surunkali yallig‘lanish belgilari bilan bo‘lgan, undagi tomirlar kengaygan va ulardagi qizil qon tanachalari stazasi bilan to‘la qonli. Tolalar atrofidagi granulyatsiya to‘qimalarining qalinligi 488+38,5 mkm ga yetdi.

Protez materialining tolalari atrofidagi granulyatsiya to‘qimalari, atrofdagi to‘qimalarga shikast etkazuvchi, implantatsiya qilingan material yuzasida reaktsiya bilan birgalikda bo‘shliqlarning rivojlanishiga olib keldi, ularning kattaligi granulyatsiya to‘qimalarining qalinligiga teng edi. Retsidiv zonasida protez atrofidagi butunlik va umumiy biriktiruvchi to‘qima kapsulasi buzilganligi ham aniqlandi. Barcha kuzatuvlarda hosil bo‘lgan nuqson kengaygan qon tomirlari bilan granulyatsiya to‘qimalari bilan to‘ldirilgan va surunkali yallig‘lanish hujayralari bilan infiltratsiya qilingan.

To‘qimalardagi bu o‘zgarishlar protezning qorin bo‘shlig‘i devoridagi eng katta taranglik joylarida uning mahkamlash chizig‘i bo‘ylab chetdan chetga siljishi uchun zarur shartdir.

Natijalar va muhokama. I guruh bemorlari orasida protez taranglik plastikasi 4 nafar bemorda takrorlangan, ulardan keyin kasallikning qaytalanishi 1 nafarida (25%) kuzatilgan. 2 (3,8%) bemorda retsidiv bilan 48 bemorda takomillashtirilgan usullardan foydalangan holda protez kuchlanishsiz plastik jarrohlik amaliyoti o‘tkazildi. Shu bilan birga, 30 nafar bemorga П shaklidagi choklar bilan endoprotez implantatsiyasi bilan nuqsonni tikmasdan “on lay” gerniallоplastika (qaytalanish – 1), 18 nafar bemorda dublikat hosil qilib nuqsonni tikmasdan “onlay+sublay” gerniallоplastika amalga oshirildi. bemorlar (retsidiv 1).

1-jadval

Churraning joylashishiga va qayta operatsiya qilish variantiga qarab retsidiv OKVCh (Ib guruhi) bo‘lgan bemorlardagi natijalar

Retsidiv churraning lokalizatsiyasi	Takroriy operatsiya variantlari			
	Protezli taranglashgan plastika n=4	Taranglashmagan protezli plastika n=52		
	Gernioalloplastika "on lay" usulida, nuqsonni oldindan tikish bilan	П shaklidagi choklar bilan endoprotezni implantatsiya qilish orqali nuqsonni tikmasdan "On lay" usulida gernioaloplastika	Dublikat yaratish orqali nuqsonni tikmasdan "onlay+sublay" gernialloplastika	Hammasi bo‘lib
M	4/1	14	4	18
M1	-	2	-	2
M2	-	4	6/1	10/1
M3	-	6/1	4	10/1
M4	-	4	-	4
ML	-	-	2	2
L	-	-	2	2
Jami	4/1	30/1	18/1	48/2

* Eslatma: maxrajdagi son churraning takrorlanish sonini bildiradi

2-jadval

Qaytalanuvchi OKVCh (Ib guruhi) bo‘lgan bemorlarda churra hajmiga va qayta operatsiya qilish variantiga qarab natijalar

Retsidiv churraning lokalizatsiyasi	Takroriy operatsiya variantlari			
	Protezli taranglashgan plastika n=1	Taranglashmagan protezli plastika n=24		
	Gernioalloplastika "on lay" usulida, nuqsonni oldindan tikish bilan	П shaklidagi choklar bilan endoprotezni implantatsiya qilish orqali nuqsonni tikmasdan "On lay" usulida gernioaloplastika	Dublikat yaratish orqali nuqsonni tikmasdan "onlay+sublay" gernialloplastika	Hammasi bo‘lib
W1	2	2	-	2
W2	2/1	10/1	4	14/1
W3	-	14	8	22
W4	-	4	6/1	10/1
Jami	4/1	30/1	18/1	48/2

* Eslatma: maxrajdagi son churraning takrorlanish sonini bildiradi

3 va 4-jadvallarda plastik jarrohlikning taranglashmagan protezli takomillashtirilgan usullaridan so‘ng retsidiv churra bilan og‘rigan bemorlarda bajariladigan operatsiyalar usullari va soni haqida ma’lumot berilgan.

3-jadval

Surunkali qorin churrasi (II guruh) bilan og‘rigan bemorlarni protezli kombinatsiyalangan plastik jarrohlik usullaridan so‘ng, ularning joylashishiga qarab davolash natijalari

Plastika usuli	Churra lokalizatsiyasi						
	M	M1	M2	M3	ML	L	Hammasi bo‘lib
П shaklidagi choklar bilan endoprotezni implantatsiya qilish orqali nuqsonni tikmasdan "On lay" usulida gernioaloplastika	2	6	2	8/1			18/1
Dublikat yaratish orqali nuqsonni tikmasdan "onlay+sublay" gernialloplastika	2			2	2	2	8
Jami	4	6	2	10/1	2	2	26/1

4-jadval

Ventral churra bilan og‘rigan bemorlarni (2-guruh) protezli kombinatsiyalangan plastik jarrohlik usullaridan so‘ng, ularning hajmiga qarab davolash natijalari

Plastika usuli	Churra o‘lchami				Hamma si bo‘lib
	W1	W2	W3	W4	
П shaklidagi choklar bilan endoprotezni implantatsiya qilish orqali nuqsonni tikmasdan "On lay" usulida gernioaloplastika	8	4	6/1	-	18/1
Dublikat yaratish orqali nuqsonni tikmasdan "onlay+sublay" gernialloplastika	2	3	1	2	8
Jami	10	7	7/1	2	26/1

1 (3,8%) bemorda retsidiv bilan barcha 26 bemorda takomillashtirilgan usullardan foydalangan holda protez taranglashmagan plastik jarrohlik amalga oshirildi. Shu bilan birga, 18 nafar bemorga П shaklidagi choklar bilan endoprotez implantatsiyasi bilan nuqsonni tikmasdan “on lay” gernialloplastika (qaytalanish – 1), “onlay+sublay” gernialloplastika bemorlarning 8 nafarida dublikat hosil qilib, nuqsonni tikmasdan amalga oshirildi.

3 va 4-jadvallardagi ma’lumotlarning tahlili shuni ko‘rsatadiki, II guruhdagi barcha bemorlarda retsidiv churra mavjud bo‘lganda, 1 va 2-variantlarga muvofiq takomillashtirilgan usullardan foydalangan holda takroriy kuchlanishsiz tuzatish amalga oshirildi. Bemorlar operatsiyalar davomida hech qanday qiyinchiliklarga duch kelmadilar. Istisnolar retsidiv anterolateral churra va 4-darajali semizlik bilan og‘rigan bemorlar uchun edi.

Bundan tashqari har bir bemorga qondagi glyukoza miqdoriga qarab qisqa muddat ta’sir etuvchi insulin birliklar hisobida kiritildi, bu har bir bemorga individual tarzda amalga oshirildi. Ushbu korrektsiyalash usuli quyidagi jadvalda keltirilgan:

5-jadval

Qondagi glyukoza, mmol/l	Ertalabki nonushta	Tushlik	Kechki ovqat	Yarim tun
<4	3	2	2	0
4,1-5,6	4	3	3	0
5,7-8,3	6	4	4	0
8,4-11,1	8	6	6	0
11,2-14	10	8	8	1
14,1-16,7	12	10	10	2
>16,7	14	12	12	3

Qisqa muddat ta’sir etuvchi insulinni kiritish rejimi (birlikda)

Natijalarning klinik va statistik tahlili shuni ko‘rsatdiki, jarrohlikdan so‘ng qandli diabeti bor retsidiv qorin churrasi bo‘lgan bemorlarda taranglashmagan takomillashtirilgan tuzatish usullaridan foydalanish, protez taranglashmagan tuzatish va qondagi glyukoza miqdorini individual ravishda qisqa muddat ta’sir etuvchi insulin bilan korrektsiyalash kasallikning ikkinchi takrorlanishini rivojlanish xavfini sezilarli darajada 3,8% gacha kamaytiradi.

Tadqiqot natijalari operatsiyadan keyingi ventral churralarni jarrohlik davolashda churra alloplastikasining takomillashtirilgan usullaridan foydalanish tavsiya etiladi, degan xulosaga kelishga imkon beradi - endoprotezni П shaklidagi choklar bilan implantatsiya qilish bilan nuqsonni tikmasdan "on lay". W1-W2) yoki dublikat protezni yaratish bilan (W3-W4 da) "on lay + sublay" mos ravishda 56,9% va 19,8% bemorlarda bajarilgan.

Ventral churra bilan og‘rigan bemorlarda taranglashmagan protezli plastikalarning tavsiya etilgan takomillashtirilgan usullari kasallikning qaytalanishini 15% dan 3,8% gacha kamaytirish orqali davolash natijalarini sezilarli darajada yaxshilash imkonini berdi.

Xulosa.

1. Surunkali qorin churrasi bilan og‘rigan bemorlarda kasallikning klinik ko‘rinishi oldingi gernioplastika texnikasiga va hamroh kasalligi qandli diabetga bog‘liq edi. Protezli gernioplastikadan so‘ng kasallikning to‘liq qaytalanishi ko‘pincha rivojlanadi. Plastik jarrohlikning taranglashmagan protezlash usuli protezning to‘qimalarga mahkamlanishining pastki va yuqori konturlari bo‘ylab churralarning qisman qaytalanishi, shuningdek, shikastlangan protezning nuqsonlari orqali churralar bilan tavsiflanadi.

2. Bemorlarda taranglashgan protezlash usullaridan so‘ng sintetik protez atrofida bo‘shliqlar paydo bo‘lishi bilan biriktiruvchi to‘qima rivojlanadi, bu protez tolalari atrofida yallig‘lanish reaktsiyasiga olib keladi; plastik jarrohlikning taranglashmagan kombinatsiyalangan usullaridan so‘ng - tolali transformatsiya belgilari, diffuz fokal lipomatoz va o‘rtacha limfotsitar infiltratsiya belgilari bilan etuk biriktiruvchi to‘qima. Yuqoridagi omillar qorin bo‘shlig‘i bosimining oshishi bilan birga retsidiv churra shakllanishiga asos bo‘ladi.

3. Operatsiyadan keyingi qorin churralarini jarrohlik davolashda churra alloplastikasining takomillashtirilgan usullarini qo‘llash tavsiya etiladi - endoprotezni П shaklidagi choklar (W1-W2 uchun) "on lay" implantatsiyasi bilan nuqsonni tikmasdan yoki protezning dublikatsiyasini yaratish bilan “on lay+ sub lay” (W3- W4 uchun), bu bemorlarning mos ravishda 56,9% va 19,8% da bajarilgan.

4. Qandli diabeti bor surunkali qorin churrasi bilan og‘rigan bemorlarda taranglashmagan protezli plastikalarning tavsiya etilgan takomillashtirilgan usullari va qondagi glyukoza miqdorini qisqa muddat ta’sir etuvchi insulin yordamida korrektsiyalash kasallikning qaytalanishini 15% dan 3,8% gacha kamaytirish orqali davolash natijalarini sezilarli darajada yaxshiladi.

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ON THE ISSUE OF STANDARDIZATION OF OSTEODENSITOMETRY RESULTS AND INTERPRETATION

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Relevance. *In recent years, a number of researchers have focused on studying the possibility of using ultrasound densitometry in assessing BMD and bone age in children. The advantages of this technique include theabsence of radiation exposure, high speed of research, good accuracy and reproducibility of the result, combined with the absence of requirements for specialized conditions during the study and low costs for its implementation. In this regard, the possibility of using ultrasound densitometry in epidemiological studiesto assess bone age is widely discussed [8-10].*

Key words: *osteoporosis; T-test; Z-test; двухэнергетическаятwo-energy absorption osteodensitometry.*

Introduction. Recent publications on the prevalence of osteoporosis have highlighted the relevance of determining bone mineral density using двухэнергетическойdual-energy absorption osteodensitometry (Dual-energy X –ray Absorptiometry-DXA). The authors of this study conducted a blitz survey of practicing radiologists on awareness of the DXA method and interpretation of automatically calculated parameters showed very disappointing results. The absolute majority of respondents, regardless of their personal experience of using DXA, found insufficient awareness of the essence of densitometric indicators, their relationship with age and gender factors, as well as the structure of the DXA protocol and conclusion. The information obtained in this way determined the feasibility of this study. In 1994. The World Health Organization has officially identified osteoporosis as an independent disease, the characteristic symptoms of which are a decrease in the amount of mineral substance in the bone and, as a result, a partial loss of its strength and an increased risk of fractures. Currently, according to numerous multidisciplinary studies, osteoporosis ranks fourth in the world in terms of prevalence ("competing" with diabetes mellitus) after cardiovasculardiseases, cancer, and sudden death (of various etiologies).

According to the Ministry of Health of the Russian Federation (2016), 34% of women and 27% of men have osteoporosis among people aged 50 and older, and the incidence of osteopenia is 43 and 44%, respectively [1]. It has been established that osteoporosis develops slowly and is often detected only after bone fractures, which is why it is called a "hidden epidemic" or" silent disease " [2, 3]. Multicenter studies have shown that bone strength is integrated in two indicators: bone mineral density (BMD), determined by densitometry, and a qualitative assessment of bone, based on the characteristics of bone structures, the level of metabolism, the presence of damage, etc. The prevalence of fractures was found to correlate with low BMD values of the lumbar spine and proximal femur (level of evidence A) [4-6]. Individual МПКТ (bone mineral density (BMD) in modern clinical practice is compared with the reference database of X – ray osteodensitometry based on the results of its most common technique – DXA. X-ray radiation at DXA is low (0.03 mSv per 1 scan) and, according to the manufacturer's instructions attached to the devices, does not require special radiation safety measures. DXA results in BMD measurement are the "gold standard" for non-invasive diagnosis of osteoporosis [4, 7]. The most informative method for assessing BMD is using T- and Z-criteria [4, 5, 7-10]. The WHO classification for the diagnosis of osteoporosis is based on the value of the standard deviation from the corresponding average BMD of the hip, lumbar spine or forearm in the control population [8]. The WHO recommendations do not specify the number of skeletal sites to be used for diagnostic densitometry, nor the areas of interest within each site. The T-test is a standard deviation above or below the peak bone mass index in young women aged 20-29 years. The recommended reference interval is obtained from the database of the Third National Health and Nutrition Examination Survey (NHANES, USA, 2003-2016). Although there are separate regulatory frameworks for men and women, NHANES recommends using a single database for people of both sexes, since the risk of fractures does not differ with the same T-criteria, according to NHANESIII [7, 10]. The T-test is used for postmenopausal women and men over 50 years of age. The WHO classification for densitometric diagnosis of osteoporosis, proposed in 1994, has not been revised to date, but changes and additions were made in 2003 [8]. Recommendations regarding indications for densitometry were limited to the population of postmenopausal women [11]. The International Society for Clinical Densitometry (ISCDDensitometry) recommends скорректированныйthat the ethnic and racial – adjusted Z-test be used instead of the T-test. It is a standard deviation from the average values, the values of which -2.0 and below should be interpreted as "low BMD for chronological age" or "below the expected age values", and above -2.0 – "within the expected age values" [3, 8]. DXA indicators serve as criteria for inclusion in the vast majority of clinical trials for the diagnosis of osteoporosis, are taken into

account when recommending therapeutic regimens, evaluating the effectiveness of treatment, and predicting the probability of fractures [4-6, 10]. As densitometry is increasingly used to diagnose osteoporosis and assess the risk of fractures, there are discrepancies in the interpretation of the results obtained by different researchers, which negatively affects the quality of medical care. In order to eliminate discrepancies and improve approaches to the interpretation and presentation of ISCD bone mineral density data, a conference was held to develop agreed positions with the participation of specialists, members of the public, equipment manufacturers and other interested parties (July 25-27, 2003, Cincinnati, Ohio). Such conferences with the revision of recommendations are held once every 2-3 years [4, 5, 9, 12]. In 2003, at the conference, the ISCD Board of Directors approved as an official document the methodological recommendations developed taking into account: - indications for densitometry; - reference database for T-and Z-criteria; - results of clinical use of densitometry of bones of the axial and peripheral skeleton – - data on the assessment of accuracy and reproducibility of measurement results on a densitometer- phantom scanning and calibration; - requirements for the presentation of results, nomenclature, and diagnosis of osteoporosisin pre-and postmenopausal women, men, and children. A full review of the materials and decisions made was published by ISCD Vice President S. M. Petak (Texas Institute for Reproductive Medicine and Endocrinology, Houston, TX, USA) in 2004, the ISCD Consensus Commission noted that the densitometric terminology used in medical literature and everyday clinical work is extremely inconsistent. To facilitate mutual understanding with colleagues and ISCD patients, it is recommended to always use: – DRA (Russian) and DXA (English). instead of DARE and DEHA, respectively; – T-criterion instead of T-criterion, t-criterion, or t-criterion; – Z-criterion instead of Z-criterion, z-criterion, or z-criterion. ISCD offers indications for adults of both sexes [9]. Densitometry is recommended for the following groups of patients – - women aged 65 years and older; - postmenopausal women younger than 65 years in the presence of risk factors; - men aged 70 years and older – - adults with an osteoporotic fracture; - adults with a disease or condition accompanied by a decrease in bone mass or bone loss – - all patients receiving anti – osteoporotic treatment to monitor its effectiveness; – all persons who are not yet receiving treatment, but who may need it in the event of a decrease in bone mass; - all patients receiving anti-osteoporotic treatment to monitor its effectiveness; - all persons who are not yet receiving treatment, but who may need it in the event of a decrease in bone mass. In accordance with these recommendations, densitometry is also indicated for women who stop taking estrogens. The ISCD Position Alignment Commission has adopted the following recommendations on the methodology of the study: 1. Areas of the skeleton where measurements are made: - the spine in the posterior projection and the proximal

femur - in all patients – - the forearm-under the following circumstances: a) impossibility of hip and/or spine densitometry or interpretation of its results; b) presence of hyperparathyroidism; c) pronounced excess body weight (higher than allowed for DXA). 2. Areas of interest in the spine: - vertebrae 1-4 of the lumbar spine, while measuring the BMD of all lumbar vertebrae, with the exception of those with local structural changes or artifacts; if densitometry of four vertebrae is not possible, the BMD of three vertebrae is measured, and if densitometry of three vertebrae is not possible, the BMD of two vertebrae is measured – - densitometry of the spine in the lateral projection has no diagnostic value. values, but can be used for monitoring purposes. 3. Areas of interest in the femur: - proximal region, neck or trochanter (choose the minimum BMD value) – - BMD measurement is performed on either leg – - Ward's zone is not suitable for diagnostic densitometry. The possibility of using the mean T-test for the proximal parts of both thighs for diagnostic purposes has not been established due to a lack of relevant data. The average BMD value can be used for monitoring purposes (preferably based on the results of densitometry of the entire proximal femur – Totalhip). 4. Area of interest in the forearm – - for diagnostic purposes, densitometry of the middle third of the radius is performed; – it is not recommended to use the results of measurements in other parts of the forearm. The WHO classification of BMD for the diagnosis of osteoporosis is based on the results of simultaneous studies of Caucasian (white) postmenopausal women, which revealed a close correlation between BMD measured using DXA and the risk of fractures by the FRAX factor (Frawithture risk assessment tool) for a lifetime [6, 9, 10]. In other populations, the relationship between BMD and fracture risk is far less obvious. Therefore, the reliability of the diagnosis of osteoporosis based on the T-test alone is significantly lower. This fact was taken into account in the ISCD recommendations for the diagnosis of osteoporosisin pre - and postmenopausal women, men, and children. Diagnosis in postmenopausal women. It is recommended to use the World Health Organization classification: - norm: T-criterion -1.0 or higher; - osteopenia: T-criterion between -1.0 and -2.5 – - osteoporosis: T-criterion -2.5 or lower. Choose the minimum value of the T-criterion obtained by densitometry of the spine in the posterior projection, the entire thigh, its neck and greater trochanter, or the middle third of the radius. Diagnosis in men (20 years and older). The WHO classification is not fully used in the interpretation of DXA: - for men aged 65 years and older, the T-test is used, and the diagnosis of osteoporosis is made when the T-test is equal to -2.5 or lower; – for men aged 50 to 65 years, the T-test can be used to establish the diagnosis of osteoporosis if it is lower than -2.5 and there are other risk factors for fractures – - in men of any age, if there are reasons for secondary osteoporosis, the diagnosis of osteoporosis is made on the basis of clinical indicators (glucocorticoid therapy,

hypogonadism, hyperparathyroidism) and confirmed low BMD; - in men under 50 years of age, the diagnosis of osteoporosis is not recommended on the basis of densitometric indicators only. Diagnosis in premenopausal women пременопаузе(from 20 years to menopause). The WHO classification is not applicable for healthy premenopausal women. When interpreting DXA: - the Z-test is used, not the T-test – - the diagnosis of osteoporosis is made in the presence of secondary causes of low BMD (glucocorticoid therapy, hypogonadism, hyperparathyroidism) or risk factors for fractures; – in premenopausal womenпременопаузе, the diagnosis of osteoporosis cannot be made based only on densitometric indicators. Diagnosis in children and adolescents of both sexes under the age of 20 years. The ISCD Consensus Commission notes that the WHO classification of BMD is not applicable to children. When interpreting DXA: - use the Z-criterion, not the T-criterion – - the T-criterion is not taken into account in DXA and is not included in the medical history – - the diagnosis of osteoporosis cannot be made based only on densitometric indicators – - if the Z-criterion is less than -2.0, use the definition of "low bone density for this chronological period". age";-the value of the Z-criterion is interpreted in comparison with the best available database for healthy children of comparable age (these standard values should be indicated in the densitometric protocol) – - spine and whole body densitometry is performed – - BMD indicators for predicting the risk of fractures in children are not precisely defined – - there are no generally accepted standards for correction BMD or bone mineral content, taking into account such factors as bone size, puberty phase, skeletal formation stage and body composition; information about the correction performed is entered in the medical history – - repeated BMD measurements are carried out using the same device, scanning method, software and methods of analyzing the results; due to the child’s growth, there may be deviations from this requirement – - any deviation from the standard protocol for adult patients (software for assessing low BMD, manually selecting areas of interest) is recorded in the medical history. Diagnosis of osteoporosis is the subject of attention of medical and scientific institutions of the Ministry of Health and professional communities of the Russian Federation. Methodological recommendations "Possibilities of bone X-ray densitometry in clinical practice" were published by the National Research Center of Preventive Medicine together with the Federal Research Center of Hematology, Oncology and Immunology in 2015 [4]. The proposed provisions are mostly in line with the ISCD recommendations. The document contains indications for conducting DXA based on the recommendations of the ISCD Position Alignment Commission (2005). Without detracting from the high practical and informational significance of the published clinical recommendations, we draw attention to the proposed assessment of DXA results in cohort groups (the term "cohort" is used in medicine to refer to a

group of subjects united by any characteristics). The authors note that in the modifications of devices operating on the DXA principle, "the regulatory databases that complete the devices are compiled for ethnic groups of the US population and do not significantly differ from the population of the Moscow region" [4]. In our opinion, the BMD indicators of residents of the Moscow region may have other normative values. This was also reflected in the ISCD conclusion that there is no obvious relationship between BMD and fracture risk in populations other than отthose indicated in the WHO recommendations. Clinical guidelines "Osteoporosis" were published in 2016 by the Russian Association of Endocrinologists with the participation of a number of professional associations of the Russian Federation [5]. Unfortunately, some эпидемиолоepidemiological studies on osteoporosis, although they include many clinical and laboratory parameters, do not take into account the importance of DXA and BMD in the diagnosis of osteoporosis and osteopenia. Recommendations for using the FRAX score calculation model as a tool for assessing the risk of bone fractures also do not always include DXA data. However, the diagnosis of primary osteoporosis, as noted in the recommendations, should be justified by the presence of a low-traumatic fracture, a decrease in BMD, or a combination of risk factors. The Russian Association for Osteoporosis proposed a therapeutic intervention point based on FRAX statistics obtained from trauma clinics in the cities of Yaroslavl and Pervouralsk. According to the independent Russian Cohort Survey According to the results of the study, the selected FRAX intervention point for the Russian population is significantly lower than the sensitivity of X-ray densitometry [6, 7]. It should be noted that the domestic studies used as the basis for the development of FRAX, in which the intervention point was estimated, do not have sufficient statistical power corresponding to similar studies at the country level in the UK or other European countries. At the same time, the authors of clinical guidelines on osteoporosis [4, 9] note that the use of a European intervention point averaged over five countries (with different fracture probabilities) may be justified until more reliable data are obtained in the Russian population. The choice of intervention threshold also depends on the availability of densitometry. It is noted that for countries where the number of densitometers is less than 1 per million population, we can talk about their insufficient number. In this case, it is advisable to select a group of patients with an average risk, for which densitometry will be optimal, while people with a low or obviously high risk of fractures should not be referred for densitometry. Thus, the concept of an intervention point, a lower and upper threshold of intervention, appears. As noted in the above recommendations, patients who fall into the group above the upper intervention threshold should be referred for treatment, and those who have a fracture probability below the lower intervention threshold do not need treatment. Patients with a probability of fractures between the lower and upper

intervention thresholds should be referred for X-ray osteodensitometry, and their probability of fracture should be evaluated depending on the result of femoral neck densitometry. Due to the fact that there is no own regulatory framework for DXA indicators in Russia, it is an urgent task to conduct cohort studies to assess the dependence of BMD on age and gender differences, race, and other factors affecting the state of bone structure: the region of residence (taking into account the number of sunny days per year, which is associated with the accumulation of vitamin D in the body), the nature of nutrition (the predominant consumption of fish, vegetables and fruits, or features of national cuisine). It is possible that the results obtained in such a population-based study will make it possible to create a differentiated Russian regulatory framework for bone mineral density indicators, compare the obtained standards with data from European studies and WHO recommendations. Development of the FRAX fracture risk assessment tool, taking into account the DXA indicators, will increase the effectiveness of treatment and prevention measures for osteoporosis. The differentiated cohort standards of dual-energy absorption osteodensitometry developed in this way остеоденситометрииwill help to improve the effectiveness of the diagnosis of osteoporosis, conduct densitometric studies with maximum benefit for the patient, and become an effective tool for identifying individuals with an increased probability of osteoporotic diseases. fractures.

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ОБЗОР ПЛЮСОВ И НЮАНСОВ ПРЕПАРАТОВ СУЛЬФОНИЛМОЧЕВИНЫ

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Введение. *Препараты сульфонилмочевины играют важную роль в лечении сахарного диабета 2 типа, что делает их актуальными для научных исследований и клинической практики. Ниже представлены ключевые аспекты, подчеркивающие их значимость.*

Увеличение заболеваемости сахарным диабетом 2 типа, Согласно данным Всемирной организации здравоохранения (ВОЗ), число людей с сахарным диабетом продолжает расти во всем мире.

Ключевые слова: *глибенкламид; гликлазид; глипизид; глимепирид; монотерапия; гипогликемия; сахарный диабет 2 типа.*

Актуальность. Ожидается, что к 2045 году количество пациентов с диабетом достигнет 700 миллионов. Это делает эффективное управление заболеванием, включая использование препаратов сульфонилмочевины, особенно актуальным. Сульфонилмочевина остается одним из наиболее распространенных классов препаратов для снижения уровня глюкозы в крови. Они обеспечивают быстрое и значительное снижение уровня глюкозы, что важно для предотвращения острых и хронических осложнений диабета, таких как сердечно-сосудистые заболевания, нефропатия и невропатия. Сульфонилмочевина часто используется в комбинированной терапии с другими антидиабетическими средствами, такими как метформин. Это позволяет достичь более эффективного контроля уровня глюкозы, особенно у пациентов, у которых монотерапия не обеспечивает удовлетворительных результатов. Исследования показывают, что комбинированные подходы могут улучшить исходы лечения и качество жизни пациентов. Применение сульфонилмочевины может снизить

риск развития долгосрочных осложнений, связанных с диабетом. Исследования показывают, что раннее и эффективное лечение может предотвратить или отсрочить развитие диабетической нефропатии, ретинопатии и других осложнений, что делает сульфонилмочевину актуальной для долгосрочной стратегии управления диабетом. Несмотря на эффективность, препараты сульфонилмочевины могут вызывать побочные эффекты, такие как гипогликемия и увеличение массы тела. Актуальность исследований в этой области заключается в необходимости оптимизации лечения, минимизации рисков и разработки новых стратегий, включая индивидуализированный подход к терапии. Существуют исследования, направленные на создание новых форм сульфонилмочевины и аналогичных препаратов, которые могут иметь улучшенные профили безопасности и эффективности. Это делает тему актуальной для научного сообщества, стремящегося к улучшению методов лечения диабета. Актуальность применения препаратов сульфонилмочевины в лечении сахарного диабета 2 типа обусловлена ростом заболеваемости, эффективностью в контроле уровня глюкозы, возможностью комбинированной терапии, а также необходимостью исследования побочных эффектов и разработки новых препаратов. Эти аспекты подчеркивают важность дальнейших научных исследований и клинических испытаний, направленных на оптимизацию терапии и улучшение качества жизни пациентов.

Механизм действия

Сульфонилмочевина действует, связываясь с рецепторами на β-клетках поджелудочной железы, что приводит к закрытию калиевых каналов и деполяризации клеточной мембраны. Это, в свою очередь, вызывает открытие кальциевых каналов, что приводит к повышению уровня кальция внутри клетки и стимулирует секрецию инсулина.

Примеры препаратов

К препаратам сульфонилмочевины относятся:

- Глибенкламид
- Гликлазид
- Глипизид
- Глимепирид

Показания

Сульфонилмочевина применяется для:

- Лечения сахарного диабета 2 типа, особенно когда диета и физическая активность не обеспечивают достаточного контроля уровня глюкозы.
- Комбинированной терапии с другими сахароснижающими средствами, такими как метформин или инсулин.

Преимущества

- Эффективно снижает уровень глюкозы в крови.
- Быстрое начало действия.
- Доступность и разнообразие форм (таблетки).

Недостатки и побочные эффекты

- **Гипогликемия**: Одним из основных рисков является возможность развития гипогликемии, особенно при неправильном применении или сочетании с другими сахароснижающими средствами.
- **Увеличение массы тела**: Некоторые пациенты могут испытывать увеличение веса при применении сульфонилмочевины.
- **Аллергические реакции**: В редких случаях могут возникать аллергические реакции на препараты.

Противопоказания

Сульфонилмочевина противопоказана при:

- Диабетическом кетоацидозе.
- Тяжелых заболеваниях печени и почек.
- Аллергии на компоненты препарата.

Заключение

Сульфонилмочевина является важным классом препаратов для лечения сахарного диабета 2 типа, обеспечивая эффективный контроль уровня глюкозы в крови. Однако их применение должно быть тщательно контролируемым, чтобы минимизировать риски побочных эффектов, особенно гипогликемии. Важно, чтобы лечение проводилось под наблюдением врача, с учетом индивидуальных особенностей пациента.

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OSTEODENSIOTOMETRY AN INNOVATIVE APPROACH TO OSTEOPOROSIS DIAGNOSTICS

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INTRODUCTION. *The generally accepted main method for diagnosing osteoporosis (OP) is axial X-ray densitometry. The high demand for densitometric studies with a small number of bone densitometers leads to a situation where doctors evaluate the results of studies performed on devices of different types and in different diagnostic centers. If densitometry is performed for the first time, the accuracy of the measurement is extremely important for diagnosing OP and initiating therapy. Reproducibility is of great importance for repeated densitometry. The accuracy of densitometers declared by manufacturers is 1%, and reproducibility is 2%, however, in real practice, taking into account the influence of all factors, the reproducibility of the results may be worse. Ensuring reproducibility and quality is important both in clinical trials of drugs, when the results of repeated observations are material for statistical processing, and in relation to a specific patient in order to assess the effectiveness of treatment.*

Keywords: *osteodensitometry, osteoporosis, trabecular bone tissue, menopause.*

In international multicenter randomized controlled trials (RCTs), high requirements are imposed on the accuracy of osteodensitometry, compliance with which is monitored by SYNARC, an international company for quality control of densitometric studies. Fulfillment of these requirements and interpretation of densitometric study results may be accompanied by certain methodological difficulties. The objective of this work is to analyze the methodological factors affecting the accuracy and reproducibility of densitometric studies. Accuracy and reproducibility of measurements. The capabilities of osteodensitometers are assessed by a number of characteristics, the main ones being

the accuracy and reproducibility of measurement results. The technical guidelines indicate an accuracy of 1%, meaning the deviation of the in situ BMD assessment results from the data obtained by direct chemical analysis of an artificial sample. Densitometers have a built-in calibration and quality control program (Quality Control, QC). During operation of the densitometer, calibration (daily in some models) is performed using an anthropomorphic phantom, which is a homogeneous cast of a block of lumbar vertebrae (L1-L4), poured into a plastic cube or a stepped phantom consisting of aluminum plates of different thicknesses also poured into plastic. For each phantom, the required value of the IPC is known, a deviation from which during calibration by +1.5% is considered acceptable by both the manufacturers and SYNARC. Based on the calibration results, a graph is automatically generated for the entire period of operation. Reproducibility characterizes the spread of the results of repeated measurements performed over a short period of time. In addition to accuracy, the reproducibility of measurements is affected by circumstances related to the operator and the patient. During a repeated examination, the operator must lay down and establish the region of interest (Region of interest,ROI) as accurately as possible in relation to the previous one. The location of the ROI in the scanning field (offset relative to the center) and changes in the patient's anthropometric parameters during the period between examinations can also affect reproducibility. The International Society of Clinical Densitometry Densitometry (ISCD) suggests using a special calculator in Excel that allows calculating the reproducibility of the operator-device complex by performing 2 repeated measurements on 15 patients (or 3 on 10 patients). If the reproducibility of the operator-device complex for ROI L1-L4 is 1.9%, this indicates that the densitometer is in good working order and the personnel are sufficiently qualified. The software (SW) of densitometers is constantly being improved and some models offer the definition of the least significant change (Least Significant Changes, LSC) for repeated observations. The LSC value will depend on the measurement accuracy for a given ROI and the version of the statistical software. Thus, in order to assess whether the BMD changes detected during a repeated examination after a long period of time (more than 1 year) are reliable, in practice, taking into account all factors, changes of less than 2% cannot be considered reliable. Information content of study areas during dynamic observation. According to the ISCD recommendations [1], to diagnose osteoporosis, it is necessary to measure BMD in two skeletal areas (lumbar vertebrae and proximal femur). To diagnose osteoporosis, it is sufficient to have a decrease in BMD in only one of the areas: the lumbar vertebrae segment (L1-L4), the femoral neck (Neck) or the entire proximal femur (Total). However, this does not mean that when a diagnosis of osteoporosis has been established and treatment has been prescribed, it is possible to limit ourselves to

monitoring the effectiveness of only one area. The conclusions on densitometry of the proximal femur include data on the Ward area or Ward's "triangle" (a term extrapolated into osteodensitometry from radiology). In fact, this is the area of the lowest density, automatically found by the densitometer software. The BMD value in the Ward area is not recommended for use in diagnosing osteoporosis [1], since the rate of metabolic processes in this area is high, and its localization depends on the projection of bone structures and software of densitometers determines it with insufficient consistency. Sometimes, within the framework of clinical studies, repeated measurements are carried out only of the proximal part of the femur. This is due to the inclusion of very elderly patients and the presence of pronounced degenerative changes in the spine, as well as the fact that this ROI is determined in the same way on all densitometer models. Modern densitometers are equipped with the "Whole Body" program, which allows obtaining data on BMD in the entire skeleton and in its different sections. Due to the large size of the ROI, the study using this program is carried out with lower resolution and the accuracy usually does not exceed 2%. In addition, the implementation of this program takes much more time than measuring BMD in standard localizations, and the reference databases are less representative than for the lumbar vertebrae and proximal femur. Therefore, the "Whole Body" program is not used in clinical practice. Our experience in using the "Whole Body" program for research purposes shows that it can be used to detect reliable changes in BMD and its distribution by skeletal sections in healthy people who were immobilized for 0.5-1 year [2]. Also, the Whole Body program was used to assess the amount and distribution of fat and lean mass in women at different stages of the postmenopausal period [3]. It is difficult to predict in advance how quickly bone mass will change in a particular area of the skeleton with age, exposure to others, or during treatment in a particular person. We found that in healthy men (astronauts), the predominance of BMD losses in the lumbar vertebrae or femur under zero gravity conditions, as well as subsequent recovery on Earth, was individually specific and was repeated during repeated flights. In addition, it turned out that the maximum mineral losses were noted not in the lumbar vertebrae and femoral neck, but in the pelvic bones [4]. A BMD loss of 1-2% per year in postmenopausal women is considered physiological and primarily affects trabecular bone tissue in the vertebrae [5,6]. However, there are differences in the rate of loss of trabecular and cortical bone tissue in women with natural and surgical menopause. If in women with natural menopause bone loss begins in the vertebrae and the proximal femur joins later, then in women after oophorectomy, BMD loss occurs simultaneously in the vertebrae and femoral neck, and osteoporosis in the femoral neck develops 1.3 times more often [7]. With a positive effect of treatment, the average increase in BMD in different parts of the skeleton is 2% per year [8] and the greatest increase is observed in the lumbar

vertebrae (Fig. 1). With such a ratio of possible BMD dynamics and densitometry reproducibility, the issues of study quality are of particular importance. Taking into account the above, the question of the predominant information content of a particular skeletal area may not have an unambiguous solution. Methodological aspects of quality and reproducibility.Compliance with domestic clinical guidelines [9] and ISCD recommendations ensures the proper quality of densitometry. Since densitometry measures the projection BMD (g/cm2), the shift of the object of study in the ROI, changing the area of its projection, affects the result. Thus, an increase in the area leads to an underestimation of the BMD. The bone boundaries and the "bone map" are determined automatically, but can be changed by the operator. Let us consider common but non-standard densitometric situations that affect the quality and result of the measurement. Study of the proximal femur. The recommendations of manufacturers of densitometers of all types for patient positioning during hip examination are the same. Correctly performed scanning assumes a vertical position of the diaphysis and a visible lesser trochanter, meaning that the foot is rotated inward and, therefore, the femoral neck should be positioned parallel to the table. A special foot retainer is provided for this. However, mechanical fulfillment of these conditions is not always possible and can lead to undesirable consequences. There are patients in whom the lesser trochanter is visible only when the foot is not rotated. In turn, refusal to rotate the foot leads to a downward deviation of the femoral neck and an overestimation of the BMD and T-score values. The opposite situation is also possible, when the lesser trochanter is “too noticeable” when the foot is rotated. Refusal to fix the foot will negatively affect reproducibility in subsequent studies. Sometimes these features can cause SINARC claims to quality and prevent the patient from being included in the RCT. The location of the femoral neck area is affected by the tilt angle determined by the operator using anatomical landmarks. A low location of this area of interest leads to an underestimation of the BMD because the area of its projection increases. The vertical size of this area, automatically suggested by the densitometer program, is rarely changed, but differences in it during repeated measurements can make the results incomparable. The vertical location of the femoral diaphysis in the ROI is also very important. Current ISCD recommendations provide for the examination of only one femur. If the operator selects automatic sequential examination of two femurs, both shafts will be located at different angles. This will not lead to large errors in determining the BMD and T-score, but will affect reproducibility, since the position of the shaft at the same angle is more difficult to repeat during a repeat examination than a vertical one. The BMD indicator for the entire proximal femur "Total" depends on how much compact bone of the shaft part falls into the ROI, i.e. on its lower border, drawn along the lower part of the lesser trochanter (or its shadow) on Hologic

densitometers or on the inclination of the femoral neck axis on Lunar densitometers. All these features should be taken into account by the operator when performing densitometry, especially if its purpose is to assess the effect of treatment.Lumbar Vertebrae Examination When performing a repeat examination to determine the dynamics of densitometric parameters, the operator should try to position the patient and set the ROI in the same way as in the first examination. The presence of the lumbosacral junction in the ROI helps to avoid errors in selecting the L1-L4 segment for analysis. In this case, the starting point and the center of the scan are determined. Failure to follow this rule, even on high-resolution densitometers, can lead to errors. When positioning the patient for examination of the lumbar spine, it is recommended to raise the legs on a special cube in order to straighten the lumbar lordosis. Unfortunately, operators sometimes neglect this, especially on densitometers with a short distance from the X-ray tube to the detectors, when the correct use of the device in obese patients is impossible. According to our observations, in some patients there is indeed no noticeable difference in the resulting scans. However, most often, failure to straighten the lordosis overestimates the BMD, and in some cases the last vertebra of the segment may be "hidden" in the projection of the vertebra located above and the sacrum, which complicates interpretation and worsens reproducibility. Anatomical features in the lumbar spine segment are not uncommon. An error in the numbering of the vertebrae will lead to the fact that the mineral density standards included in the reference databases will be applied to the vertebrae located above, and this will underestimate the T-criterion. Therefore, SYNARC recommends counting the vertebrae from below in atypical situations, taking the vertebra located above the sacrum as L5. The starting point of the scan, which determines the location of the ROI, is easily controlled and, if necessary, its position is corrected by a repeat scan. Since the patient’s position along the axis of the device is determined visually, even with correct positioning, it may turn out that the position occupied by the lumbar segment is slightly different from that on the scan, with which it is important to compare. In cases with small deviations, the resulting scan is usually accepted for analysis by operators. We determined the effect of a 1.5 cm shift from the center of the ROI location during placement on the result. For this purpose, 15 scans of an anthropomorphic phantom of the L1-L4 vertebral segment were performed, located in the center of the scanning window and with a lateral shift of 1.5 cm (Table 1). Deviation from the central position led to a decrease in BMD by 0.06 g / cm2 or 0.61%. This effect is explained by an increase in the projection area of the segment. At the same time, the amount of mineral (g) in the segment did not change. The study was performed under "ideal" conditions, i.e. on a stationary object with a known mineral content at a constant thickness and composition of "surrounding tissues". In vivo, the

effect of ROI shift could be greater. The measured difference in BMD values is small, but it should be taken into account that it is added to the usual parameters of accuracy and reproducibility. It is known thatthat due to the geometry of the fan beam, there are "edge effects" and other features that are overcome by the developers of densitometer software. The operator's task is to prevent a decrease in the metrological capabilities of the densitometer. The practice of densitometric studies shows that taking into account only quantitative indicators, which include the BMD, leads to the fact that in some cases osteoporosis remains undetected. For example, uniform compression of the vertebral bodies can remain unnoticed. At the same time, due to a decrease in the projection area of the L1-L4 section, the BMD values will be higher than in the previous examination, even in the presence of bone loss. This situation can be recognized by paying attention to the absolute amount of minerals (g) in the studied segment, the change in the projection area (cm2) and the height of the segment. Altered vertebrae cannot be used to diagnose osteoporosis: compressed, deformed, with traces of past injuries and surgical interventions, foreign inclusions and metastases. Diagnostics in the L1-L4 segment is carried out in the presence of 2 or more interpreted vertebrae. The densitometry results are presented in a report, the content of which is determined by the specialist conducting the study. Most specialists choose the option that includes all the indicators, but abbreviated versions are also possible. For doctors, the most interesting are the BMD and T-criterion. During dynamic observation, such indicators as the size of the ROI, the projection area of the site (cm2), the amount of minerals (g) can also be very important. Taking them into account will allow us to assess the reliability of the data obtained. A decrease in the height of the segment or individual vertebrae over the period between studies indicates the possible development of compression deformations.

CONCLUSION. The physician prescribing treatment for OP should inform the patient that its effectiveness can only be monitored using the same densitometer. The data obtained using the same densitometer will have to be compared "manually" and this can only be done by the operator, taking into account all the features of the first study. Even a software update on the same densitometer can affect the comparability of the results. Of course, there are algorithms for comparing the results obtained using different densitometers (HOLOGIC, LUNAR, NORLAND), cross-calibration procedures and formulas for recalculating readings are described, but they do not cover all the modifications released, cannot take into account all the technical features of densitometers and, moreover, factors introduced by the operator. If the patient's examinations were performed using different densitometers, and the need to have an idea of the dynamics of densitometric indicators is great, you can try to estimate the dynamics using the T-criterion. This approach is justified by the fact that all

densitometers operating on the DXA principle (HOLOGIC, LUNAR, NORLAND) have been using a single NHANES III database since 2003, which includes ethnic groups of the US population. However, it should be taken into account that a small change in BMD can lead to a noticeable change in the T-score, since in accordance with the accepted standards, BMD is calculated with an accuracy of 0.001 g / cm2, and the T-score is up to 0.1. The compared areas should be the same, i.e. the ROI of the femoral neck is also oriented and have the same relative sizes. A lower location of the femoral neck area leads to an underestimation of BMD. The lumbar vertebral segment should consist of the same vertebrae in both studies and have no significant differences in the bone "map". These recommendations apply to a situation where dynamic monitoring is important. In the absence of osteoporosis and long intervals between examinations (several years), the current status is of decisive importance, not the dynamics. The data presented in the article do not mean that the accuracy and diagnostic value of modern densitometers are insufficient. For more than 30 years of improving osteodensitometers, from gamma-photon monoenergetic and dual-energy to X-ray with a point and fan beam, the accuracy of densitometers (1%) has not changed, and is unlikely to change soon. Ensuring the quality of the study and the correct interpretation of its results will always remain the main task of specialists. It is important that the high quality requirements imposed in international RCTs are maximally widespread in the practice of conventional densitometric studies.

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ПОЛОЖИТЕЛЬНОЕ ВЛИЯНИЕ ФИЗИЧЕСКОЙ АКТИВНОСТИ НА ПОСТПРАНДИАЛЬНУЮ ГЛИКЕМИЮ ПРИ ГЕСТАЦИОННОМ ДИАБЕТЕ

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Актуальность. *Гестационный сахарный диабет (ГСД) представляет собой преходящее нарушение углеводного обмена, возникающее в период беременности. В последние десятилетия наблюдается тенденция к увеличению числа случаев ГСД, что обусловлено изменением образа жизни, ростом числа женщин с избыточной массой тела и ожирением, а также увеличением среднего возраста беременных. ГСД может привести к серьёзным осложнениям как для матери, так и для плода. У женщин с ГСД повышается риск развития преэклампсии, инфекций и более сложных родов. У плода могут развиться такие осложнения, как макросомия, респираторный дистресс-синдром и повышенный риск развития диабета второго типа в будущем. Ранняя диагностика и адекватное лечение ГСД имеют решающее значение для снижения рисков. Скрининг на ГСД рекомендуется проводить у всех беременных женщин, что подчёркивает важность своевременного выявления этого состояния. Женщины, столкнувшиеся с гестационным сахарным диабетом, подвержены повышенному риску развития диабета второго типа в будущем. В связи с этим крайне важно не только контролировать уровень глюкозы в период беременности, но и осуществлять дальнейшее наблюдение и профилактику после родов. Образование и поддержка играют ключевую роль в управлении состоянием женщин с гестационным сахарным диабетом. Информирование о правильном питании, регулярных физических упражнениях и самоконтроле уровня глюкозы может существенно улучшить исходы как для матери, так и для ребёнка. Управление гестационным сахарным диабетом требует*

сотрудничества различных специалистов, включая акушеров-гинекологов, эндокринологов, диетологов и медицинских сестёр. Это подчёркивает важность комплексного подхода к лечению данного состояния. Таким образом, гестационный сахарный диабет представляет собой актуальную проблему, обусловленную его широкой распространенностью, потенциальными угрозами для здоровья матери и ребёнка, а также необходимостью своевременной диагностики и эффективного контроля состояния для предотвращения развития долгосрочных осложнений.

Ключевые слова: *физическая активность; гестационный сахарный диабет; гликированный гемоглобин, гипогликемия.*

Цель нашего исследования: Известно, что физические упражнения положительно влияют на здоровье людей с диабетом и людей, подверженных риску его развития. Упражнения увеличивают утилизацию глюкозы скелетными мышцами, улучшают эффекты инсулина и, таким образом, могут быть инструментом, помогающим регулировать уровень глюкозы, в том числе и у беременных женщин с гестационным сахарным диабетом (ГСД). Поддержание нормогликемии при ГСД необходимо для предотвращения материнских и перинатальных осложнений беременности. Количественный учет параметров физической нагрузки потенциально может повысить точность прогнозирования постпрандиального гликемического ответа (ППГО). Целью исследования являлась оценка точности моделей прогнозирования ППГО с включением данных физической активности и без них у женщин с ГСД.

Материалы и методы: В исследование включено 50 беременных женщин с ГСД. Участницы исследования заполняли дневники питания и самоконтроля гликемии, проводилось непрерывное мониторирование гликемии в течение 7 дней. Число приемов пищи, на которых была обучена и протестирована модель, составило 758 записей. Физическая активность оценивалась на основе сигналов акселерометров и фотоплетизмографов, фиксируемых на запястьях испытуемых в ходе исследования во время непрерывного мониторирования гликемии. Использовались фитнес-браслеты ONETRAK C317 Pulse. С их помощью зафиксировано количество шагов в день (в том числе ходьба, бег), количество потраченных калорий в день, частота сердечных сокращений. Были оценены модели ППГО (построенные на основе данных о приемах пищи, характеристик пациентов и анкет, характеризующих образ жизни) с включением данных физической активности и без них.

Результаты: Модели, построенные с включением данных физической активности (ходьба и другая аэробная нагрузка за 15, 30, 60, 120, 180, 360, 1440 минут до еды) беременных женщин с ГСД показали лучшую точность при прогнозировании уровня глюкозы через 1 час после приема пищи при кроссвалидации и на данных новых пациентов. Включение в модель данных физической активности в сравнении с моделями без подобных данных привело к снижению средней абсолютной ошибки (0,43 ммоль/л против 0,45 ммоль/л) и повышению корреляции между фактическими и прогнозируемыми значениями (R=0.68 против R=0.65) при прогнозировании уровня сахара через 1 час после начала приема пищи. Выводы: Включение данных физической активности повысило точность прогнозирования постпрандиального уровня гликемии у беременных женщин с ГСД.

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ЕР ҚАЪРИДАН ФОЙДАЛИ ҚАЗИЛМАЛАРНИ ҚАЗИБ ОЛИШНИ ЭКОЛОГИК ТАЪСИРИ ВА УНИ СОЛИҚЛАР ОРҚАЛИ ТАРТИБГА СОЛИШ

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Аннотация: *Ер қаъридан фойдаланганлик учун солиқ, ер қаъридан фойдаланганлик учун солиқ, кенг тарқалган фойдали қазилмалар, кондициялар, минерал хом ашё, саноат аҳамиятига молик ер ости сувлари, тажриба-саноат йўсинида кавлаб олиш, техноген минерал ҳосилалар, фойдали компонент, фойдали қазилма кони, фойдали қазилмалар, фойдали қазилмаларни кавлаб олиш, олтин изловчилар усулида кавлаб олиш.*

Аннотация: *налог за пользование недрами, налог за пользование недрами, общераспространенные полезные ископаемые, кондиции, минеральное сырье, подземные воды промышленного значения, опытно-промышленная добыча, техногенные минеральные продукты, полезный компонент, месторождение полезных ископаемых, полезные ископаемые, добыча полезных ископаемых минералов, промывка.*

Abstract: *tax on the use of subsoil, tax on the use of subsoil, widespread minerals, conditions, mineral raw materials, groundwater of industrial importance, experimental and industrial mining, man-made mineral products, useful component, mineral deposit, minerals, mining of minerals, prospector's method of mining.*

Калит: *сўзлар: ер, ер қаъри, солиқ, ер ости, минерал, кондициялар, хом ашё, тажриба-саноат, сув, ер ости сув, руда, норуда, ер қаъри участкаси, маркшейдер.*

Ключевые слова: *земля, недра, налог, подземные, полезное ископаемое, кондиции, сырье, опытное производство, вода, подземные воды, руда, отходы, участок недр, маркшейдер.*

Key words: *land, subsoil, tax, underground, mineral, conditions, raw materials, experimental industry, water, underground water, ore, non-ore, subsoil section, markshader.*

Кириш

Мамлакатимизда олиб борилаётган ислоҳотлар натижасида, сўнгги йилларда ер қаъридан фойдаланиш, ер ости бойликларига эгалик қилиш ва уларни тасарруф этиш, шунингдек ер қаъридан фойдаланиш ҳамда уни муҳофаза қилиш чоғида юзага келадиган муносабатларни тартибга солиш, ер, сув (бундан саноат аҳамиятига молик ер ости сувлари мустасно), ўсимлик ва ҳайвонот дунёсидан, атроф муҳит ҳавосини асраш ҳамда уни экологик жиҳатдан муҳофаза қилиш кенг аҳамият берилмоқда. Мақолани ёзишимиздан асосий мақсад яратилган кенг имкониятлар билан бирга камчиликларга ҳам аҳамият бериш ва уни бартараф этиш юзасидан хулоса, таклиф ҳамда тавсияларни амалиётга татбиқ этиш ҳисобланади.

Адабиётлар таҳлили ва методология

Ўзбекистон Республикасида ўз фаолиятини амалга ошириб келаётган хўжалик юритувчи субъектлар ва жисмоний шахслардан ундириладиган ер қаъридан фойдаланганлик учун солиқ бўйича қатор тадқиқотлар олиб борилган. Жумладан, Е.С.Смирнов солиқ таҳлилига қуйидагича таъриф берган: “Солиқ таҳлили деганда – корхонанинг ресурс салоҳиятини (потенциалини) ҳар томонлама ўрганиш, улардан самарали фойдаланиш ва солиққа тортишнинг таъсири даражаси ҳамда аниқ даврда корпоратив солиқ сиёсатини таснифлашда фойдаланадиган қоида ва усуллар йиғиндиси тушунилади (2013) [1].

Н.Б.Ашурова томонидан юридик шахсларни солиққа тортишдаги муаммоларини ўрганиш ва уни такомиллаштириш борасида илмий тадқиқот ишларини олиб борган (2018) [2].

Ш.А.Тошматов томонидан ўз мақолалари ва илмий тадқиқот ишларида корхоналар томонидан тўланадиган солиқлар ва уларни такомиллаштириш масалалари чуқур ўрганиб чиқилган (2022) [3].

Ушбу йўналишда халқаро миқёсда амалга оширилган тадқиқотлар қаторида. В.С.Панчова ишларида нефть ва газ қазиб олувчи корхоналарининг ер қаъридан фойдаланганлик учун солиқ ундиришдаги муаммолар ва уларни ечимлари келтириб ўтилган (2015) [4].

Е.А.Кулина ўз мақоласида Хитой иқтисодиётида ресурс солиқларини ундириш ва уни такомиллаштиришдаги муаммо ва ечиларини келтириб ўтган (2015) [5].

Тадқиқотнинг мазкур йўналишларида Ўзбекистон Республикасида кенг миқёсда ислоҳотлар амалга оширилаётганини хам эътироф этишимиз мумкин. Ўзбекистон Республикаси Президентининг 2021 йил 6 октябрдаги “Геология қидирув ишларини янада рағбатлантириш ва ер қаъридан фойдаланувчиларга солиқ солиш тартибини такомиллаштириш чора-тадбирлари тўғрисида”ги ПФ

6319-сонли Фармони ва Солиқ кодексига киритилган ўзгартиришлар ер қаъридан фойдаланувчи компанияларга солиқ солиш қоидаларини жиддий ўзгартирди. Фармон билан чет эл инвестицияларини кенг жалб қилган ҳолда фойдали қазилма конларини саноат усулида ўзлаштириш, замонавий усуллар ва технологиялар ёрдамида геология қидирув ишларини рағбатлантириш ҳамда ер қаъридан фойдаланувчиларга солиқ солиш тартибини янада такомиллаштириш назарда тутилган.

Натижалар

Амалга оширилиши лозим вазифалари сифатида ер қаъридан оқилона фойдаланиш, қазилмани аниқлаш борасида намуна олиш мақсадида қазилмани портлатиб олиш усулидан воз кечиш яъни намуна олишни Австралиянинг қазилмани лом усулида намуна олиш тизимини амалиётга жорий этиш, барча йирик конларда жойлашган заводлари ўзининг ишлаб чиқаришини ривожланган мамлакатларнинг энергия тежам-кор ва сифатли маҳсулот ишлаб чиқарувчи технологиялари билан алмаштириш вазифаси қўйилди. Маркшейдерлик фаолиятида эса замонавий ускуна ҳисобланган ҳамда ер қаъри қазилма бойлигини юқори аниқликда кўрсатадиган 3D кўз ойнак билан таъминлаш натижасида тўғри хулоса ва ҳажмини кўрсатиш имконига эга бўлиш мумкин.

Муҳокама

Агар юқорида келтирилган жиҳозлар билан таъминланмаслик оқибатида табиат ва экологияга, инсон саломатлигига жиддий зарар етказиш мумкин деб ҳисоблаймиз.

Масалан борди-ю кон маҳаллий аҳоли зич бўлган ҳудудда аниқланса ва уни қазиш ишлари амалга оширилиши натижаси, ўша ҳудудида жойлашган инсонларнинг саломатлигига жиддий зарар етказилиши бўйича ечим қилинмаса аҳоли орасида ўпка сил касалликлари, онкологик касалликлар, юрак қон томир кассалиликлари ривожланиб кетишини кузатиш мумкин бўлади. Бундан ташқари бугунги кунда жисмоний шахслар ва якка тартибдаги тадбиркорларга қиммат баҳо металлар ва олтин қазиб олиш усулига рухсат берилган бўлиб уни амалга учун ёйма олтин кон жойлашган ҳудудга бириктирилган заводга мурожаат қилиш ва рухсатнома олган ҳолда ушбу фаолият билан шуғулланиш мумкинлиги ҳаммага маълум эмас аммо бунинг оқибатида ноқонуний ёйма олтин ковлаб олувчилар кўплиги ва уларнинг орасида ер қатлами босиб қолиш ҳолатлари учраб турганлиги ҳамда уларнинг хавфсизлиги кафолатланмаганлиги натижаси деб ҳисоблаймиз.

Хулоса

Хулоса ўрнида экологик муҳитни яхшилаш мақсадида ишлаб турган ва чет эл инвестицияси асосида ташкил этилаётган корхона ва заводларга заҳарли

чиқит ҳавони атроф муҳитга чиқармаслик учун мажбурий фильтр ўрнатиш талаби қўйилиши мақсадга мувофиқ деб ҳисоблаймиз

Ер қаъридан қазилма бойликни аниқлаш мақсадида намуна олишда портлатиб олиш усулидан тўлиқ воз кечган ҳолда лом усулида намуна олиш ва хулоса беришни амалиётга кенг татбиқ этиш мақсадга мувофиқ деб ҳисоблаймиз.

Қиммат баҳо металлар ва олтин қазиб олиш усулидаги фаолиятни амалга оширувчи жисмоний шахс ва якка тартибдаги тадбиркорларни ушбу ўзини ўзи банд қилиш бўйича фаолият турига қўшиш ҳамда мажбурий суғурта асосида фаолият юритишини таъминлаш ҳамда қазиб олган рудани эркин баҳода давлатга топшириш имконини бериш лозим деб ҳисоблаймиз. Юқорида келтириб ўтилган таклиф ва тавсиялар мамлакатимизда айнан шу соҳани ривожланиши учун хизмат қилса мақсадга мувофиқ бўлади.

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DIFFERENT APPROACHES TO LEARNING MATHEMATICS

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ABSTRACT

Mathematics is a fundamental subject that plays a crucial role in various fields, including science, engineering, economics, and technology. Developing strong mathematical skills is essential for logical reasoning, problem-solving, and analytical thinking. However, different learners have different needs and preferences, which is why multiple approaches to learning mathematics exist. This document explores various methods used to teach and learn mathematics, their benefits, challenges, and how they can be combined for optimal learning outcomes.

Key Words

Mathematics learning, Problem-solving, Critical thinking, Inquiry-based learning, Visual learning, Mastery learning, Collaborative learning, Traditional methods, Mathematical reasoning, Analytical thinking, Interactive tools, STEM education.

Traditional Approach

Description: This method follows a structured curriculum where students learn through direct instruction, textbooks, and repetitive exercises. Teachers explain mathematical concepts step by step, provide examples, and assign practice problems for students to solve.

Advantages:

- Provides a well-organized and systematic way of learning.
- Helps students develop discipline and consistency in studying.
- Ensures that fundamental mathematical concepts are covered comprehensively.

Disadvantages:

- Can be rigid and may not cater to students who struggle with abstract concepts.
- Often relies heavily on memorization rather than deep conceptual understanding.
- May not encourage creativity and independent thinking.

Problem-Based Learning (PBL)

Description: PBL is a student-centered approach that involves solving real-world problems. Instead of being given direct instructions, students explore concepts through problem-solving and inquiry. This approach encourages deeper understanding by requiring students to apply their knowledge in practical situations.

Advantages:

- Encourages students to think critically and develop problem-solving skills.
- Helps learners see the real-world applications of mathematics.
- Promotes independent learning and collaborative work.

Disadvantages:

- Can be time-consuming as students may struggle to find solutions on their own.
- Some students may find it difficult without prior foundational knowledge.
- Requires teachers to carefully guide students to ensure learning objectives are met.

Visual and Interactive Learning

Description: Many students find it easier to understand mathematical concepts through visual aids, such as graphs, diagrams, and animations. Interactive tools, including educational software and apps, can enhance engagement and make abstract concepts more accessible.

Advantages:

- Makes complex mathematical ideas more concrete and understandable.
- Increases student engagement and motivation to learn.
- Allows learners to experiment and visualize different problem-solving approaches.

Disadvantages:

- May require access to technology, which is not always available.
- Some students may become too reliant on visual aids and struggle with traditional problem-solving methods.
- Not all mathematical concepts can be easily visualized.

Inquiry-Based Learning

Description: This approach encourages students to ask questions, investigate patterns, and explore mathematical ideas through experimentation. Rather than simply following formulas, students develop their own reasoning and understanding.

Advantages:

- Fosters curiosity and a deeper understanding of mathematical principles.
- Encourages students to think like mathematicians and develop their own problem-solving strategies.
- Promotes long-term retention of knowledge.

Disadvantages:

- Requires a solid foundation in basic mathematical skills before exploration can be effective.
- Some students may struggle without direct instruction or structured guidance.
- Teachers need to be skilled in facilitating discussions and guiding student inquiry.

Mastery-Based Learning

Description: This method ensures that students fully understand a concept before moving on to the next one. It prioritizes depth over speed, allowing students to progress at their own pace until they demonstrate mastery of a topic.

Advantages:
- Prevents gaps in knowledge and ensures a strong mathematical foundation.
- Builds student confidence by allowing them to learn at their own pace.
- Encourages a growth mindset by emphasizing understanding rather than speed.

Disadvantages:
- Can be slow for students who grasp concepts quickly and prefer a faster-paced learning environment.
- Requires personalized learning plans, which may be challenging in large classrooms.
- Assessment and tracking progress can be complex.

Collaborative Learning

Description: In this method, students work in groups to solve problems, discuss mathematical concepts, and explain their reasoning to each other. Collaboration enhances understanding by allowing students to learn from different perspectives.

Advantages:
- Encourages teamwork and communication skills.
- Helps students clarify their understanding through discussions and peer explanations.
- Provides support for struggling students who can learn from their peers.

Disadvantages:
- Group dynamics can impact learning if some students do not participate equally.
- May not be suitable for students who prefer working independently.
- Requires careful structuring to ensure all students benefit from the collaborative process.

Conclusion

There is no single ‘best’ method for learning mathematics. The most effective approach depends on a student’s individual learning style, strengths, and goals. Some learners may benefit from a structured and traditional approach, while others may excel through inquiry-based or interactive learning. A combination of methods can often be the most beneficial, allowing students to develop a deep understanding while staying engaged in the learning process. Teachers and learners should experiment with different approaches to determine what works best for them.

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THE RISE OF AI: TRANSFORMING TECHNOLOGY AND THE FUTURE

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ABSTRACT

Artificial Intelligence (AI) is no longer just a concept from science fiction—it has become an integral part of modern technology. AI is transforming industries, improving efficiency, and reshaping the way we interact with machines. From healthcare and education to business and entertainment, AI is driving technological advancements that were once unimaginable. However, with its rapid growth come challenges, including ethical concerns, privacy issues, and the impact on employment. This article explores the role of AI in modern technology, its applications across different sectors, the potential risks associated with its development, and what the future holds for AI-driven innovations.

Keywords: *Artificial Intelligence, AI, Technology, Automation, Machine Learning, Deep Learning, Data Science, Healthcare AI, AI in Business, AI Ethics, Smart Cities, Autonomous Vehicles, AI in Education, AI in Entertainment, AI Challenges, AI Future Trends.*

Understanding Artificial Intelligence

Artificial Intelligence refers to the simulation of human intelligence in machines. These machines are programmed to think, learn, and make decisions, much like humans. AI can be classified into three main types:

1. Narrow AI (Weak AI): Designed for specific tasks, such as voice assistants (Siri, Alexa) or recommendation systems (Netflix, YouTube).
2. General AI (Strong AI): A more advanced form of AI that can perform any intellectual task that a human can. This type of AI is still in development.
3. Super AI: A hypothetical AI that surpasses human intelligence in all aspects. This concept is still theoretical and not yet achieved.

AI's Impact on Technology and Society

Automation and Efficiency in Industries

One of the biggest advantages of AI is automation. Many industries use AI-powered robots and software to perform repetitive tasks quickly and accurately. Examples include manufacturing, retail, and finance, where AI-driven solutions improve productivity and reduce human errors.

AI in Healthcare: Revolutionizing Medicine

AI has made significant contributions to the healthcare industry, improving diagnosis, treatment, and patient care. It is used in medical imaging, predictive analytics, robotic surgeries, and virtual health assistants to enhance accuracy and accessibility.

AI in Education: A New Era of Learning

AI is transforming education through personalized learning, automated grading, virtual tutors, and smart classrooms, making education more interactive and accessible.

AI in Business: Improving Decision-Making

Businesses leverage AI for customer insights, chatbot assistance, supply chain optimization, and fraud detection, enabling data-driven decision-making and efficiency.

AI in Entertainment and Media

AI is revolutionizing entertainment by recommending personalized content, generating AI-created media, enhancing video games, and curating social media feeds.

Challenges and Ethical Concerns in AI Development

Despite its benefits, AI also presents several challenges, including job displacement, data privacy issues, algorithmic bias, ethical dilemmas, and an increasing dependence on AI in decision-making processes. To address these concerns, regulatory measures and responsible AI development practices must be enforced.

The Future of AI and Technology

AI is advancing rapidly, and its future possibilities are exciting. Some predicted developments include autonomous vehicles, smart cities, AI in space exploration, scientific research, and increased human-AI collaboration. These innovations will continue to reshape industries and society.

Conclusion

Artificial Intelligence is no longer a futuristic dream—it is already reshaping our world. AI enhances efficiency, automates tasks, and improves decision-making in various industries. However, addressing ethical concerns and ensuring fairness in AI development is essential. As AI continues to evolve, embracing it responsibly will unlock its full potential, leading to a smarter, more connected, and technologically advanced future.

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TEMIRGA ISHLOV BERISH: PICHOQCHILIK SAN'ATI

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San'atshunoslik: tasviriy va amaliy san'at
yo'nalishining 2-bosqich talabasi

Annotatsiya: *Pichoqchilik- bu temir yoki boshqa metal buyumga ishlov berib, unga bezak berish san'atidir. Maqolada pichoqchilik san'atining tarixdan to hozirgi kunga qadar rivojlanishi, uning badiiy bezaklariga ta'sir ko'rsatgan omillar, O'zbekistondagi maktablari, ulardagi an'analari va yangiliklar bayon etiladi.*

Boshqa amaliy san'at yo'nalishlaridan ajralib turuvchi soha, temirga ishlov berish ya'ni pichoqchilik O'zbekistonda o'z maktablariga ega bo'lib, hunarmandchilikning mahalliy an'analarini o'zida saqlab kelmoqda. Nodir bezakli pichoqlar yasashda o'zbek ustalariga teng keladigani yo'q. Uning tarixi insoniyatning eng qadimgi tarixi bilan bog'liq bo'lib, saqlanib qolgan namunalar ushbu san'atning o'rta asrlardan keng taraqqiy etgani, pichoq, xajar va qilichlar ko'rinishida rivojlanganidan darak beradi. Pichoqchilik tarixi bo'yicha M.YE.Masson, Y. A Zadneprovskiy, O. A. Papaxristu kabi olimlarning tadqiqodlarida ma'lumotlar keltirilgan. Shuningdek S.Ibroximov, S.Bulatova, Z.Esonovlar xam o'z tadqiqotlarida pichoqchilik soxasiga doir tarixiy va etnologik ma'lumotlarni keltirib o'tilgan.

Pichoqchilik bu eng birinchi paydo bo'lgan amaliy san'at yo'nalishlridan biri bo'lib qadimda ilk sivilizatsiya paytida o'z ehtiyojlari yoki himoya qilish uchun foydalanganlar. Ilk pichoqlar odatda tosh, hayvon yoki inson suyagi, yog'ochlardan bo'lgan. Keyinchalik bu san'at yo'nalishi asrlar davomida takomillashishining natijasida temir, mis, bronza va po'latdan yasaladi, lekin eng birinchi temirning paydo bo'lishi pichoqchilik san'atida katta inqilobga sabab bo'ladi. Qadimda pichoqlar orqali odamlar o'zlarini himoya qilishganini, hattoki ular bizni turli xil yovuz ruhlardan asraydi degan diniy tushunchalar ham bo'lgan. Buni biz o'sha davrda topilingan pichoqlarning bezaklari yoki g'orlardagi devoriy suratlari, ibodat bilan bog'liq ekanligini bilamiz. "Dandon sopli pichoq" va "karkesopli pichoq" bunga misol bo'la oladi, chunki ularni qadimdan ilohiy deb bilishgan va bu keyinchalik turli xil urf-odatlar paydo bo'lishiga sabab bo'ladi. Misol uchun agar pichoq uyda saqlansa o'g'il farzand tug'iladi deb ishonishgan.

Har bir yasalgan pichoqni o‘zining texnikasi, naqshlari va uslubi orqali qayerda ishlab chiqarilganligini bilib olsa bo‘ladi. Pichoqlardan turli xil maqsadlarda foydalanilganligi uchun ham uning turlari ko‘p, Masalan, jangovar pichoqlar, sayohlarga mo‘ljallanga cho‘ntak pichoqlari, oshxona pichoqlari, o‘tkir tig‘li qurollar va diniy marosimlarga mo‘ljallangan hamda rassomlar uchun alohida qalam ochishda foydalanadigan pichoq turlari bor.

Markaziy Osiyo hududlarida pichoqlar erkaklarning kuch-qudratining ramzi bo‘lgan, aynan qadimdan to hozirgi kungacha bu erkaklarning haqiqiy kuchining belgisiga aylangan. O‘zbekistonda pichoqchilik san’ati qadimdan gullagan bo‘lib bunga Afrosiyob, Varaxsha, Bolaliktepa va boshqalarda olib borilga arxeologik qazishmalar natijasida miloddan avvalgi 2- ming yillikga oid pichoq namunalari topilgan. Bu keyinchalik pichoqchilikda turli xil mahalliy an’analarga xos maktablar paydo bo‘lishiga sabab bo‘ladi. 6-12-asrlarda pichoq yasash rivojlanib, unga turli xil bezak berish texnologiyalari o‘zgaradi. 15-17-asrlarda yonga osib yuriladigan pichoq turlari paydo bo‘ladi, asosan podshohlarda va boy zodagonlar o‘zlarini ulug‘vor yoki salobatli ko‘rsatish uchun pichoqlarni shunday olib yurishni boshlagalar. Belga osib yuradigan pichoqlar turi Alisher Navoiy, Zahiriddin Muhammad Bobur asarlariga ishlanga miniatyura tasvirlaridan bilib olsak bo‘ladi.

O‘zbekiston xonliklar davrida ham hukmdorlar pichoqlari qimatbaho toshlar bilan inkrustiyatsiya qilinib bezak berilgan va ulardan faqatgina, yon tomonga osib, bezak sifatida foydalanishgan. Hukmdorlar pichoqlaridagi bezak sifatida foydalanilgan toshlar chetdan keltirilgan bo‘lgan, hamda pichoqlarni odatda yassi yoki uzunchoq shaklda ishlashgan. Pichoqlarni vazifasiga ko‘ra turlari bor aynan hukmdorlar uchun yasalgan pichoqlar alohida, harbiy soha uchun yasalgan pichoqlar ulardan ancha farq qiladi. Pichoqchilar ustaxonasi o‘z uylariga yaqin bo‘lishi uchun ularga alohida hududning bir qismini ajratib berishgan va barcha pichoqchilarning yashash joyi o‘sha yerda bo‘lgan. Bu joy hozirgachan mavjud bo‘lib “Pichoqchilar” mahalasi deb nomlanadi.

Keyinchalik pichoqchilikning o‘ziga xos maktablari paydo boladi. XIX-XX-asr pichoq ishlab chiqarish markazlari Farg‘ona, Samarqand, Buxoro, Toshkent, Qashqadaryo, Surxandaryo, Xorazm viloyatlarida 20 ga yaqin markazlar bo‘lgan. Ular o‘zining ishlash texnologiyasi, ixchamligi, shakli va bezaklari bilan bir-biridan farq qiladi. Bu markazlarga Chust, Shahrihon, Qora suv, Qo‘qon, Xiva, Toshkent va boshqa pichoqchilik maktablari kiradi.

XX asrga kelib pichoq ishlab chiqarish zavodlari ham tashkil etilgan. Agar avvalari hunarmandlar ishlagan bo‘lsa bu davrda esa artellar tashkil qilinib, ustoz-shogird an’analari asosida jamoa tashkillashtirilgan. Shunga qaramay zavod va artellar

mahalliy maktablarning o’ziga xos badiiy uslubi, texnikasi va rang-barngligini yo’qolishi olib kelgan.

O’zbekiston mustaqillikka erishgan yillardan boshlab boshqa amaliy san’a turlari qatorida pichoqchilik yo’nalishni rivojlantirish maqsadida turli amaliy ishlar, mahorat darslari tashkillashtirilmoqda. Bu esa xar bitta viloyatning “ustoz-shogird” an’analarini tiklashga yordam bermoqda.

Pichqolar madaniy merosning tarkibiy qismi sifatida amaliy bezak naqshi sifatida ham namoyon bo’lgan. Misol uchun: kashtachilik, kulolchilik, me’morchilik kabi yonalishlarda pichoq naqshidan erkaklik qudrati, quvvati, nasl davomiyligi ramzi sifatida foydalaniladi. Temuriylar davriga kelib Xitoy chinnilari juda mashhur bo‘ladi va aynan bu davrda ularning chinnilariga taqlid qilib ular tan sulolasiga tegishli bo‘lgan “san sai” chinnisiga taqlid qilib ishlay boshlaydilar, va boshqa davlatlarga eksport qilishgan. Temuriylar davrida asosan ularning laganlarida pichoqning naqshi tushurilgan. Chinilarda yashil, sariq va oq ranglardan foydalanib, pichoqni ko‘pincha markazda tasvirlashadi. Va bu keyinchalik badiiy kulolchilik an’analariga aylanib hozirgi kulolchilik buyumlarida ham qolanilishini ko‘ramiz. Yoki tasviriy san’atning rangtasvir yo‘nalishida turli xil janrlar asosida chizilgan kartinalarda ko‘ramz. Misol uchun: Karavadjoning eng mashhur asarlaridan biridan “Ishoqning qurbonligi” dagi kabi diniy janr asosida chizilgan kartinalarda pichoqning tasvirini ko‘ramz. Bu kartinada Ibrohim o‘z o‘g‘li Xudoning buyrugi bilan Ishoqni qurbon qilmoqchi bo‘ladi va aynan bu paytda, uni Rabbiyning farishtasi kelib to‘xtatadi va o‘g‘lining o‘rniga qo‘zichoqni qurbonlik qiladi. Va aynan bu kartinada Ibrohim o‘g‘li Ishoqning boyniga tutib turgan pichoqning tasviri bor. Bunga o‘xshash tasvirlarni biz Sharq miniatyura tasvirlarida ham bor.

Pichoqchilik san’ati uzoq sharq mamlakatlari, O‘rta Osiyoda qadimdan rivojlangan. Keyinchalik Yevropa shaharlarida, temir pichoqlar haqidagi ma’lumotlar qadimgi yunon epik shoirlari Gomer va Gesiod asarlarida yozilgan. 14-asrda Germaniya, Angliya, Avstriya, Fransiyada pichoqchilikni kasb sifatida taqiqlab faqatgina oshxonalarda foydalanishga ruxsat berilgan. Yevropa amaliy san’atida pichoqchilik yasalish usuli va qisman ko‘rinishi, sharq mamlakatlari an’analarini yodga soladi, lekin ba’zi joylariga o‘zgartirishlar kiritilinganligi uchun u darajada sezilmaydi. Hozirgi kunda esa texnikasi va funksiyalari sharq mamlakatlaridan umuman farq qiladi.

Umuman olganda har bitta pichoqning yasalish texnikasi bo‘ladi. Usta tanlangan materialni oladi va unga kuchli zarbalar berish orqali pichoqning tig‘i o‘zida kerakli shaklini hosil qiladi. Pichoqning asosiy qismi tayor bo‘lgandan keyin, usta uni

izlarini tozalaydi va yuzasini to‘g‘irlab, muhr bosish ishi boshlanadi va aynan muhr bosish jarayonida usta o‘z iste’dodini ko‘rsatadi, ya’ni bu hunarmandning o‘z dashati hisoblanadi.

Keyingi ish bu pichoq uchun alohida tutqich yasash hisoblanadi, tutqichlarni asosan yog‘ochdan yoki suyaklardan yasashadi va unga ham alohida bezak berilib pichoqga o‘rnatiladi. Pichoq tutqichining ham turlari bolib bular: “Sukma dasta”, “Erma dasta”, “Naqshinkor dasta” va boshqalar. Oxirida ular uchun maxsus charmdan g‘ilof tikiladi va bu o‘tkir pichoqlarda kesib olmaslik va bezak uchun yasaladi, lekin asosiy maqsadi foydalanuvchiga zarar yetqazmalik bo‘lgan. Pichoqlarning tig‘ini bigiz, qalam, naqsh, naycha qalami kabi oyg‘ich qalamlar bilan bezatiladi. Pichoqlarni oyib naqsh berishda asosan bigizdan foydalaniladigan asbob, u ko‘kqalam hamda naqsh bigiz xilida bo‘ladi. Bu pichoqlar ustaning o‘ziga buyurtma qilishadi va ustaning o‘zi avlodan avlodga o‘tib kelayotgan an’ana asosida pichoqni yasaydi.

O’zbekistonda badiiy hunarmandchilik asosida ishlaydigan pichoqchi ustalar unchalik ko‘p emas. Misol uchun: Usta Shokir Kamalov Buxoro pichoqchilik maktabi vakili sanaladi. U 1946-yil tavallud topgan bo’lib, oliy malumotga ega, Buxoro pedagogika instituti, filologiya fakultetini bitirgan. SH.Kamolovni ota bobolari buyuk temirchi hunarmandlar bo‘lishgan. Shunday qilib u bolaligida temirchilikni yahshi o‘zlashtirgan, umuman olganda temirchilikdan tashqari u san’atni boshqa yonalishlarini ham o‘zlashtirgan va bu keyinchalik o‘z kasbida katta foyda olib kelgan. Usta mis ustidan zarb berish texnikasini yangilash orqali asrlar davomida an’anaga aylanib kelgan temirchilik uslubiga o‘zgartirishlar kiritadi. Institut davridanoq ko‘plab temirchilik kasbini professional darajada o‘zlashtirib olgandi va bir vaqtning o‘zida ko‘plab hunarmandlar ko‘rgazmalarda ishtirok etdi. Dastlabki yillarda oilaviy sharoit qiyinchilil tug‘dirdi. Temirchilik kasbi orqali pul topish qiyin bo‘lganligi uchun bor kuchini va hayotini shu kasbiga bag‘ishladi va natijada keyinchalik uning ishlari omma etiborini o‘ziga jalb qildi. Sh.Kamolov temirchilikning barcha yo‘nalishlarida ijod qilgan: qishloq xo‘jaligi asboblari, pichoqlar, qaychilar, chiroqlar, suvenirlar va hattoki metal haykalchalarni ilk ijod namunalari desak bo‘ladi. Lekin unga beriladigan asosiy buyurtma bu pichoqlar bo‘lgan, chunki pichoq boshqa temirdan yasalgan asboblardan farq qilgan va bu Buxoro maktabi paydo bo‘lishiga sabab bo‘lgan. Hozirgi kunda SH.Komolov o‘z o‘g‘li bilan birgalikda ustaxonada ish faoliyatligini olib borishmoqda. Ularning 30 xil turdagi temirchilik mahsulotlari bor, va ularning norasida pichoqlar alohoda o‘ringa ega. Usta o‘z farzandiga ota bobolarida o‘rgangan barcha temirchilik hunarmandchilikning barcha sir asrorlari o‘rgatib kelmoqda.

Chust pichoqchiligi o’ziga xosligi bilan boshqa markazlarga nisbatan ajralib turgan. Xususan Chust pichoqchi ustalari tomonidan yasalgan pichoqlarning uchi uchun va yuqoriga qarab, dastasi pastga qarab yasalgan. Bu kabi shaklda yasalgan pichoqlarni xaridorlari asosan qassoblar sanalgan. Bugungi kunda Chust pichoqchiligida o’ziga xos xunarmandchilik maktablari shakllanib bormoqda. Shulardan biri Ubaydullayev Raximjon pichoqchi sanaladi. U o’zining faoliyati davomida 30 dan ortiq shogirtlariga pichoqchilik sirlaridan saboq berib kelmoqda. Ubaydullayev Raximjon pichoqchilik maktabining 6 vakili sanaladi. Raximjon pichoqchi uyida pichoqchilikka oid uy muzey tashkil etgan. Ubaydullayev Raximjon pichoqchining o’g‘li Rayimjon pichoqchi xam otasidan pichoqchilik san’ati o’rganib oilaviy an’anani davom ettirmoqda.

200 yillik tarix an’anasiga ega Shahrixon milliy pichoqsozlik maktabining yetuk vakili Rahmatxo’ja Alixo’jayev sanaladi. Pichoqsoz XVII asr oxiri XVIII asr boshlarida Shahrixon pichoqchilik san’atiga asos solgan pichoqchi usta Ismoilxo’ja sulolasining yettinchi avlod davomchisi sanaladi.O’zbekistonning yirik va nufuzli markazlaridan biri, Ustaning an’anaviy va betakror sayqal berilgan “Kumush sarbasta”, Brig sarbasta”, “Suqma”, “Chilmixa”, dastali “Qayqi”, “Qozoqcha”, “Tolbargi” va boshqa turdagi pichoqlari nafaqat respublikamizda, balki Yaponiya, Saudiya Arabistoni, Turkiya, Germaniya, Hindiston, Amerika kabi xorijiy davlatlarda xalqaro, badiiy ko’rgazmalar, savdo yarmarkalari va xususiy savdogarlar orqali o’zbek milliy pichoqchilik san’ati namunasi sifatida tarqalgan.

Xulosa sifatida aytish mumkinki, festival va ko’rgazmalarda xorijiy mutaxassislar e’tiborini Chust pichoq, Qorasuv pichoq, Shahrixon pichoq, Buxorcha pichoq, Poyto’g‘ pichoq, Qo’qon pichoqlari alohida tormoqda. SH. Kamolov, R.Alixo’jayev, R.Ubaydullayev kabi pichoqsozlar ajdodlardan saqlanib kelgan mahorat va zamonaviy usullarni uyg‘unlashtirgan holda o’z ijodiy malaka va an’analarni “ustoz-shogird” yondashuvida davom ettirmoqdalar. Ularning hunarlari va ijod namunalari bugungi yosh ustalar orasida yuksak did, beqiyos mahorat, kasbga muhabbat hamda buyuk qadriyatlar ramzi bo’lib qolmoqda.

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NEFT VA GAZ KONLARINI QAZIB OLISH VA LOYIHALASHTIRISH

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Annotatsiya. *Neft va gaz konlarini qazib olish va loyihalashtirish nazariyasi, geologiya va texnologiyalarning murakkab integratsiyasini o‘z ichiga oladi. Qazib olish jarayonida o‘rganish, baholash, texnik loyihalashtirish va ekologik xavfsizlik bo‘yicha qabul qilingan qarorlar asosiy ahamiyatga ega. Shu bilan birga, bunday jarayonlar iqtisodiy va ijtimoiy ahamiyatga ham ega bo‘ladi.*

Kalit so‘zlar: *Skvajina, konlar, massivlar, kimyoviy ta’sirlar, atmosfera, zararli gazlar.*

OIL AND GAS FIELD DEVELOPMENT AND DESIGN

Annotation. *The theory of oil and gas field development and design involves the complex integration of geology and technology. In the extraction process, the decisions made based on exploration, evaluation, technical design, and environmental safety are of key importance. At the same time, such processes also have economic and social significance.*

Key words: *Well, fields, reservoirs, chemical effects, atmosphere, harmful gases.*

Neft va gaz – dunyoning energiya resurslari bozorida ulkan o‘rin tutadigan xom ashyolar hisoblanadi. Ularning qazib olinishi va undan samarali foydalanish uchun aniq va mukammal loyiha ishlab chiqish, innovatsion texnologiyalarni qo‘llash hamda ekologik xavfsizlikni ta’minlash juda muhim ahamiyatga ega.

Neft va gaz, global energiya ehtiyojlarini ta’minlashda muhim ahamiyatga ega bo‘lib, ularning qazib olish usullari texnologik rivojlanish va muhandislik yondoshuvlari bilan har yili yangilanib bormoqda. So‘nggi yillarda neft va gaz qazib olishda innovatsion texnologiyalar, jumladan, sun’iy lift texnologiyalari,

ma’lumotlarni tahlil qilish uchun aqlli sensorlar va sun’iy intellektning qo‘llanilishi orqali konlarni samarali boshqarish imkoniyatlari paydo bo‘ldi. Ushbu texnologiyalar yordamida qazib olish jarayoni yanada optimallashtirilmoqda va ekologik xavf kamaytirilmoqda.

Neft va gaz qazib olish usullari texnologiyaning rivojlanishiga qarab har yili yangilanib bormoqda. Har bir usulning o‘ziga xos afzalliklari va kamchiliklari mavjud bo‘lib, ular turli konlarni ekspluatatsiya qilishda muhim rol o‘ynaydi. Suv osti burg‘ulash, gorizontal burg‘ulash, suv bosimi va kimyoviy usullar kabi texnologiyalar, neft va gaz qazib olishni yanada samarali va ekologik jihatdan xavfsiz amalga oshirishga yordam beradi. Biroq, bularning barchasi yuqori texnik bilimlar va innovatsion yondoshuvlarni talab qiladi.

Neft va gaz qazib olish ishlari, ko‘pincha konni o‘rganish bosqichidan boshlanadi. Bu bosqichda, geologik tadqiqotlar, seysmik izlanishlar va yer osti tuzilmalari o‘rganiladi. Konlarni o‘rganish jarayonida geologlar va muhandislar yer ostidagi resurslarni aniqlash, ularning xususiyatlarini o‘rganish va qazib olishning eng samarali usulini tanlash uchun turli metodlar va texnologiyalarni qo‘llaydilar.

Loyiha rejalashtirish jarayoni quyidagi bosqichlardan iborat:

1. **Konning o‘rganilishi**: Geologik tahlillar yordamida, yer ostida mavjud bo‘lgan neft yoki gazning o‘lchami, joylashuvi va boshqa texnik xususiyatlari aniqlanadi.
2. **Tajriba va sinov ishlari:** Birinchi navbatda, laboratoriya sinovlari o‘tkazilib, konning ekspluatatsiya imkoniyatlari o‘rganiladi. Bu bosqichda quyosh, suv va boshqa omillarni hisobga olish zarur.
3. **Loyiha rejalari va texnik shartlar:** Qazib olish jarayonining batafsil rejalari ishlab chiqiladi. Ushbu rejalarda, konning joylashuvi, neft va gazni olish texnologiyalari, xavfsizlik choralar va ekologik hisoblar kiritiladi.
4. **Tijorat va iqtisodiy baholash:** Konning foydaliligini baholash, ya’ni qazib olish jarayonining iqtisodiy samaradorligi, xarajatlar va daromadlarni tahlil qilish kerak.

Neft va gazni qazib olish usullari

Neft va gazni qazib olishda qo‘llaniladigan bir nechta usullar mavjud. Har bir usul konning xususiyatlariga, joylashuvi, kontexnik sharoitdan kelib chiqqan holda hamda boshqa omillarga qarab tanlanadi.Tanlangan har bir usullarning o‘ziga yarasha kamchilik va afzalliklari mavjud.

Vertikal burg‘ulash - bu an’anaviy qazib olish usulidir. Bu usulda, burg‘ulash asboblari vertikal yo‘nalishda yer ostiga tushiriladi va neft yoki gaz shu yo‘l bilan yer ustiga chiqariladi. Vertikal burg‘ulash, odatda konning yuqori qatlamlarida joylashgan resurslar uchun samarali hisoblanadi. Biroq, bu usulning samaradorligi past bosimli yoki yengil neft va gaz konlarida yuqori bo‘ladi.

1-jadval

Vertikal burg‘ulash	
Afzalliklari	**Kamchiliklari**
Oddiy va arzon, tez amalga oshiriladi va asosan kichik va o‘rta hajmdagi konlar uchun mos keladi.	Keng miqyosda unumdorlikni oshirish qiyin, katta hajmdagi konlar uchun mos emas.

Gorizontal burg‘ulash - vertikal burg‘ulashga nisbatan yanada samarali usul bo‘lib, yer ostiga gorizontal yo‘nalishda burg‘u burg‘ilanadi. Bu usul ko‘proq keng hududdan neft yoki gaz olishga yordam beradi va uning samaradorligi yuqori bo‘ladi. Ko‘pincha past bosimli yoki yuqori viskoziteli neft va gaz konlarida qo‘llaniladi.

2-jadval

Gorizontal burg‘ulash	
Afzalliklari	**Kamchiliklari**
Keng hududdan samarali foydalanish imkoniyatini beradi, ko‘p teshiklar orqali ko‘proq neft yoki gaz olish mumkin.	Qazib olish jarayoni yanada murakkab va qimmat, texnik xizmat ko‘rsatish va monitoring talab qilinadi.

Suv osti burg‘ulash texnologiyasi - dengiz yoki okean bo‘ylari bo‘yida joylashgan neft va gaz konlaridan resurslarni olish uchun ishlatiladi. Bu usulda, maxsus burg‘ulash platformalari va qazib olish uskunalari yordamida suv ostidagi konlardan neft yoki gaz chiqariladi. Suv osti burg‘ulash texnologiyasi dunyo bo‘ylab samarali qo‘llanilmoqda.

3-jadval

Suv osti burg‘ulash texnologiyasi	
Afzalliklari	**Kamchiliklari**
Dengiz yoki okean bo‘yidagi konlarni samarali qazib olish imkonini beradi ekologik xavfsizlik choralariga rioya qilish.	Yuqori texnologiyalar va qurilmalar talab qilinadi, ekologik xavf va xavfsizlik masalalari yuzaga kelishi mumkin.

Suv bosimi va termal texnologiyalar - Suv bosimi texnologiyasida, suyuqliklar yoki gazni yer ostiga yuborish orqali ularni sathga chiqarish jarayoni amalga oshiriladi. Ushbu usulda suv yoki bug‘ yordamida neft va gazning yuzaga chiqishi qo‘llaniladi. Bu texnologiya, ayniqsa, neftning viskozitasi yuqori bo‘lgan konlar uchun samarali hisoblanadi.

4-jadval

Suv bosimi va termal texnologiyalar	
Afzalliklari	**Kamchiliklari**
Kam bosimli konlarda samarali ishlaydi, viskozligi yuqori neftni chiqarish imkoniyatini yaratadi.	Qo‘shimcha suv resurslarini talab etadi. ekologik xavflarni keltirib chiqarishi mumkin.

Ekologik xavfsizlik va barqarorlik

Neft va gaz qazib olishning ekologik xavfi juda katta. Konlarni qazib olishda, erdan chiqarilgan neft yoki gaz atrof-muhitga zarar yetkazishi mumkin. Ushbu jarayonning ekologik xavfsizligini ta’minlash uchun bir qator choralar ko‘riladi. Misol uchun, qazib olish jarayonida chiqindilarni qayta ishlash, zararli gazlarni ushlab turish va tabiiy resurslardan oqilona foydalanish kerak.

Atrof-muhitga ta’siri: Neft va gaz qazib olish atrof-muhitga zararli ta’sir ko‘rsatishi mumkin. Suv manbalarining ifloslanishi, yer yuzasining buzilishi va atmosferaga zararli gazlar chiqarilishi kabi muammolar yuzaga keladi.

Barqaror energiya resurslari: Barqaror rivojlanish nuqtai nazaridan, neft va gaz qazib olishda ilg‘or texnologiyalarni qo‘llash va ekologik xavf-xatarlarni minimallashtirish muhimdir.

Neft va gaz sanoati dunyo iqtisodiyotining muhim tarmoqlaridan biri bo‘lib, energetik resurslarni qazib olish va ulardan foydalanish jahonning barcha mamlakatlari uchun strategik ahamiyatga ega. So‘nggi yillarda neft va gaz konlarini loyihalashda innovatsion texnologiyalarning joriy etilishi ushbu sohaning samaradorligini oshirishga, resurslarni optimallashtirishga, va ekologik xavflarni kamaytirishga xizmat qilmoqda.

Barqaror rivojlanish nuqtai nazaridan, neft va gaz qazib olishda ilg‘or texnologiyalarni qo‘llash va ekologik xavf-xatarlarni minimallashtirish muhimdir. Yangi texnologiyalar yordamida konlarni onlayn monitoring qilish, qazib olish jarayonini boshqarish va optimallashtirish imkoniyati yaratiladi. Sun’iy intellekt va katta ma’lumotlarni tahlil qilish orqali kon qazib olish jarayonining samaradorligini oshirish mumkin.

Neft va gaz sanoatidagi loyihalash jarayoni yuqori darajada murakkab bo‘lib, uning muvaffaqiyati ko‘p jihatdan texnologiyalarga bog‘liqdir. Resurslarni qazib olish, ularni qayta ishlash, transport qilish va saqlash jarayonlari har biri o‘zining texnik va iqtisodiy murakkabliklariga ega. Shunday qilib, innovatsion texnologiyalar orqali bu jarayonlarni optimallashtirish, xavfsizlikni ta’minlash, va ekologik salbiy ta’sirlarni kamaytirish mumkin.

Innovatsion texnologiyalar nafaqat konlarni qazib olish jarayonini, balki butun sanoat zanjirini yaxshilashga qaratilgan. Bu texnologiyalarni joriy qilish konlarning iqtisodiy samaradorligini oshiradi va shu bilan birga energetik xavfsizlikni ta’minlaydi.Neft va gaz konlarini qazib olish va loyihalash jarayoni murakkab va yuqori texnologik talablarni qo‘yadi. Har bir kon uchun mos keladigan usul va texnologiyani tanlash, uning iqtisodiy samaradorligi va ekologik xavfsizligini ta’minlashda muhim ahamiyatga ega. Bunday texnologiyalarni joriy qilish orqali neft va gazni samarali va barqaror ravishda qazib olish mumkin. Neft va gaz konlarini loyihalashda innovatsion texnologiyalar, qazib olish jarayonlarini samarali va xavfsiz amalga oshirishda muhim rol o‘ynaydi. Geologik tadqiqotlardan tortib, aqlli sensorlar va sun’iy intellekt texnologiyalarigacha bo‘lgan barcha innovatsiyalar konlardan resurslarni yanada samarali foydalanishga, ekologik xavfsizlikni oshirishga va iqtisodiy samaradorlikni oshirishga yordam beradi.

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ОЗОНОТЕРАПИЯ В КОМПЛЕКСНОМ ЛЕЧЕНИИ ГЕРПЕТИЧЕСКИХ КЕРАТИТОВ

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Актуальность проблемы. Герпетическая инфекция является одной из наиболее распространенных скрыто протекающих вирусных инфекций. Как признано во всем мире, вирус герпеса является наиболее частой причиной поражения роговицы (Каспаров А.А., 1994; Майчук Ю.Ф., 2000; Falcon M.G., 1987; Martines MJ. et al., 1997; Sharma A., Shimeld C., 1997 и др.). Герпес роговицы среди взрослых по разным источникам составляет 20-75 %, а среди детей 70-80 % от числа всех воспалительных заболеваний роговицы (Акберова С.И., 1999; Chong E.M. et al., 2004). Общее число больных герпетическим кератитом в нашей стране ежегодно превосходит 300.000 (Каспаров А.А., 1994; Майчук Ю.Ф., 1997). Рецидивы заболевания наблюдаются у 33 % больных после перенесенного впервые герпетического кератита, вероятность повторных обострений после первого рецидива достигает 50 % (Каспаров А.А., 1994, 2004). В структуре слепоты вследствие поражения роговицы (так называемой роговичной или корнеальной слепоты) герпетические кератиты прочно занимают первое место (Каспаров А.А., 2002,2004; Майчук Ю.Ф. с соавт. 1990). Отличаясь тяжелым рецидивирующим течением, герпетические кератиты нередко приводят к значительному нарушению зрительных функций, длительной временной или стойкой утрате трудоспособности. Широкое распространение, рецидивирующее течение, неблагоприятные исходы герпетического кератита заставляют офтальмологов искать пути лечения этого заболевания. Несмотря на большое количество предложенных в последние годы противовирусных препаратов, лечение этого заболевания остается трудной задачей. Примерно в 3035 % случаев герпетического кератита отмечается резистентность к лучшим противовирусным средствам (Каспаров А.А., 1994, 2004). В связи с этим актуальным является поиск новых эффективных методов лечения герпетического кератита. В современном представлении герпетические кератиты являются системным вирусиндуцированным иммунопатологическим заболеванием (Н.С. Зайцева, 1981; А.А.Каспаров, 1994; Ю.Ф. Майчук, 1997;

Thomas J., Rouse B.T., 1997; Thomas J. M.D., 2001). При нарушении функций иммунной системы вирус может ускользать от действия иммунных факторов, причем эти нарушения может вызывать сам вирус (Покровский В.И. с соавт., 1993). В ряде случаев герпетическая инфекция принимает затяжное течение и плохо поддается традиционным методам лечения. В последнее время значительно повысился интерес к немедикаментозным средствам лечения, которые могут существенно понизить фармакологическую нагрузку на пациента, при этом активно воздействовать на патологический процесс и способствовать улучшению функционального состояния различных органов и систем (Нероев В.В. с соавт., 2003). К таким методам относится озонотерапия - современный, высокоэффективный и экономически выгодный метод лечения, характеризующийся хорошей переносимостью и малым количеством противопоказаний. Известно, что озон обладает вирицидным, бактерицидным, иммунокорригирующим, антиоксидантным эффектом, а также способностью улучшать реологические свойства крови, микроциркуляцию, регенерацию (Бояринов Г.А. с соавт., 1992, 1999; Корнилаева Г.В., 1992; Зуев В.М., 1995; Давыдкин Н.Ф. с соавт., 1998; Змызгова А.В., Максимов В.А., 2003; Конторщикова К.Н., 1998, 2003, 2004; Перетяган С.П., 2003; Klug W., Knoch H.C., 1991; Riva Sanseverino E., 1991; Wells K.N. et al., 1991 и др.). Опыт применения озона в офтальмологии позволяет сделать вывод об эффективности озонотерапии при ряде глазных заболеваний (Гундорова Р.А. с соавт., 1996; Борзенок С.А. с соавт, 1998; Лапина И.М., Синелыцикова И.В., 1998; Нероев В.В. с соавт., 2003). Однако не изучены патофизиологические механизмы лечебного действия озона при герпетических кератитах в зависимости от тяжести заболевания, длительности анамнеза. Нет данных о влиянии озонотерапии на состоянии иммунологической реактивности, ПОЛ и антиоксидантной системы организма в зависимости от дозировки и кратности введения.

Цель – изучить эффективность озонотерапии у больных сгерпетическим кератитом на фоне традициональная медикаментозная противовирусная лечение.

Материал и методы. Нами было произведено лечения больных с герпетическим кератитом на базе глазного отделения многопрофильной клинике СамГМУ. Больных положили на стационар по направлению поликлиниках города Самарканд. Клиническое лечения больных проводилось за период 2024 года. В глазном отделении СамГосМу нами было обследовано 20 больных (20 глаз) с различными формами герпетического кератита. Распределение больных по полу было следующим: женщин было 12 человек (60%), мужчин – 8 (40%). Нами было зависимости от метода лечения пациенты разделены на 2 группы. 1 – группа основная 10 больных которые получили на фоне традиционные лечения

получили озонотерапия. 2 – группа 10 (10 глаз) больных которым было проведенно только традиционное медикоментозное лечения. К традиционным методам лечения герпетического кератита относилось: противовирусное лечения в виде глазных гелях «Вирган» 4 раза в день, а также общее противовирусное препараты «ацикловир 400 мг» по 1 таблетки 4 раза в течение 5 дней, антибиотики в виде глазне капли Андропс по 2 капли 4 раз в день, нетероидное противовосполательне капли Броксинак 1 раз в день, а также корнеопротектор Корнерогел 3 раза в день, на ночь больным назначено антигистаминное препарат Диазалин. Озонотерапию больные получали на аппарате "Медозон О-1" в виде внутривенного капельного введения 1 раз в день курс лечения составила 7 дней озонированного физиологического раствора (доза озона в каждом конкретном случае подбиралась индивидуально и варьировала от 4 до 8 мг/л). А также больным закапали раствор Озона по 2 капли 4 раза в день. Всем больным проводили следующие общие офтальмологические методы обследования: визиометрию (по таблицу Головина Свцева), биомикроскопию (на аппарате ФРГ) произведенно флюресинетное диагностика роговой оболочки. Определяли чувствительность роговой оболочки методом Алгизометрия. Рефракцию роговице на кератометре.

Результаты. Эффективность лечения нами было изучено по следившем признакам: острота зрения, инфилтрт на роговой оболочки. Эпетилизация поверхнесть роговой оболочки. Улучшения чувствительность роговой оболочки, а также улучшения прозрачности прозрачности. При из учения остроты зрения у обеих групп больных была отмеченно резкое понижения зрения у обоих групп больных. Острота зрения у первое группе больных варьировала от 0,04 до 0,6 в среднем она сставила 0,1±0,04 в начале лечения через 10 дней от начало лечения она в среднем составляла 0,3 и 0,08. Через месяц она в средном состовляла 0,42 ±0,08. А у боьных которые получили только традиционное лечения острота зрения до лечения варьировала от 0,03 до 0,5 в средном она составляла 0,15 ±0,06. Через 10 дней от начло лечения она в среднем составляла 0,28±0,08. Через месяц от начало лечения она в среднем составила 0,35±0,08-0,07. Улучшения остроты зрения на наш взгляд видимо связанно с уменьшением отека роговой оболочки, а также улучшения прозрачности прозрачность роговицы. При применения озонотерапия острота зрения по сравнению с больным которые не получили озонотерапия несколько лучше, это видимо связано с улучшением питания роговой оболочки за счет оксегенации Показатели исходной остроты зрения у больных отличались значительной вариабельностью, что свидетельствовало о различной степени вовлечения в патологический процесс роговицы. Отмечалось достоверное улучшение остроты зрения в группе

больных с герпетическим кератитом, получавших традиционное консервативное лечение а также группа больных получившиеся традиционые медикаментозное лечения в сочетание озонотерапия. Однако надо отметит что этот показатель лучше сохронается и дольго держится у групп больных получившие озонотерапия. Начальные признаки эпителизации у больных получившие озонотерапия начиналось с 7 го дня от начало лечения и она составила у 6 больных (60%). Через 10 дней эпетелизация у 4 больных (40%). Средний срок эпителизации роговицы больных составил 9,15 дней. Эффективность лечения оценена так: полное выздоровление - у 7 больных (70%), улучшение - у 3 (30%). Начальные признаки эпителизации роговицы у больных которые получили традиционная медикаментозная лечения в течение первой недели наблюдали у 4 больных (40%), на 2-й недели, у 4 (40%) – на 3-й недели у 2 больных (20%) лечения. Средний срок полной эпителизации роговицы – 14,2 дня. Эффективность лечения оценена следующим образом: выздоровление у 4 больных (40%), улучшение – у 6 больных (60%). Нами было изучено срок восстановления чувствительность роговой оболочки методом алгизометрия.

Было установлено восстановления чусвительность у 1 группе больных на 10 день и в среднем она составила 15 дней. Больные 2 группы начальные признаки чувствительности роговой оболочки появилось с 15 го дня и в среднем составила 20 дней. Улучшения чувствительности роговой оболочки при использования озона терапии по сравнением с традициоим медикаментозным терапии на наш взгляд связанно с рассасыванием инфильтрата и отека роговой оболочки который приводить к освобождения нервной окончании за счет ослабления сдавления последнего. Инфильраты на роговой оболочки начали рассасывается у больных 1ой группы с 5 го дня и заканчивались на 20 день. И среднем составляла 15±0,08. У больных 2ой группы начало рассасывания инфильтрата было на 8 день и длилось до месяца и в среднем составила 21 ±0,08 день. Быстрое рассасывания инфильтрата при использования озонотерапии видимо связанно с атомарном кислородном которое имеется в составе озона и является сильным окислителом, обладающим противовосполительным, анитибактериальным, антивирусным эффектом. Таким образом, достигнутый эффект после сочетанного применения консервативного лечения с озонотерапией сохраняется более 6 мес. Применение озонотерапии усиливает эффект консервативного лечения, способствуя более быстрому рассасыванию инфильтрата на роговице.

Заключение. Комплексное применение традиционного медикаментозного лечения герпетического кератита в сочетании с озонотерапией способствует повышению эффективности лечения, улучшению клинических показателей и отсутствию рецидивов заболевания более продолжительный срок по сравнению со стандартной консервативной терапией.

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