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YUZ-JAG‘ SOHASIDAGI YUMSHOQ TO‘QIMA NUQSONLARINI REKONSTRUKTIV JARROHLIK USULLARI BILAN TIKLASH

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ANNOTATSIYA

Ushbu maqolada yuz-jag‘ sohasidagi yumshoq to‘qima nuqsonlarini rekonstruktiv jarrohlik usullari bilan tiklashning zamonaviy tamoyillari tahlil qilindi. Ish adabiyotlar sharhi va analitik sintez dizaynida bajarilib, mahalliy va regional flaplar, teri ko‘chirib o‘tkazish, facial artery musculomucosal (FAMM) flap, radial forearm free flap (RFFF), anterolateral thigh (ALT), medial sural artery perforator (MSAP), scapular tizim va boshqa mikrovaskulyar erkin flaplarning klinik o‘rni baholandi. Rekonstruksiya tanlovida defektning o‘lchami, chuqurligi, intraoral yoki ekstraoral joylashuvi, funksional birliklar, radioterapiya tarixi, donor soha morbidligi va bemorning umumiy holati muhim ekanligi ko‘rsatildi. Zamonaviy erkin flap rekonstruksiyalarida muvaffaqiyat ko‘rsatkichlari ko‘pincha 95–99% diapazonida bo‘lsa-da, kichik va o‘rta nuqsonlarda mahalliy yoki regional flaplar kam operativ yuklama bilan yaxshi funksional va estetik natija berishi mumkin. Rekonstruktiv “pog‘ona” tamoyili saqlanib qoladi, biroq tanlov faqat nuqson kattaligiga emas, balki “eng sodda” usuldan ko‘ra “eng mos funksional to‘qima”ni tanlashga asoslanishi kerak.

Kalit so‘zlar: yuz-jag‘ rekonstruksiyasi, yumshoq to‘qima nuqsoni, mahalliy flap, regional flap, erkin flap, mikrovaskulyar rekonstruksiya, ALT, RFFF, FAMM, donor soha morbidligi.

АННОТАЦИЯ

В статье проанализированы современные принципы реконструктивного восстановления дефектов мягких тканей челюстно-лицевой области. Работа выполнена в формате обзора литературы и аналитического синтеза с оценкой местных и регионарных лоскутов, кожной пластики, лоскута FAMM, лучевого лоскута предплечья, переднелатерального лоскута бедра, медиального



икроножного перфорантного лоскута, лопаточной системы и других микрососудистых свободных трансплантатов. Показано, что выбор метода определяется размером и глубиной дефекта, интра- или экстраоральной локализацией, функциональными единицами, предшествующей лучевой терапией, состоянием реципиентных сосудов, морбидностью донорской зоны и общим состоянием пациента. Современная свободная микрохирургическая пересадка тканей обычно характеризуется высокой жизнеспособностью лоскута, однако при небольших и средних дефектах местные и регионарные лоскуты позволяют добиться хорошего функционального и эстетического результата при меньшей операционной нагрузке. Концепция реконструктивной лестницы остается полезной, но оптимальная тактика должна определяться принципом соответствия ткани дефекту.

Ключевые слова: челюстно-лицевая реконструкция, дефект мягких тканей, местный лоскут, регионарный лоскут, свободный лоскут, микрохирургия, ALT, RFFF, FAMM, донорская зона.

ABSTRACT

This article reviews contemporary reconstructive strategies for soft-tissue defects of the maxillofacial region. The study was designed as a literature review and analytical synthesis evaluating local and regional flaps, skin grafting, the facial artery musculomucosal flap, radial forearm free flap, anterolateral thigh flap, medial sural artery perforator flap, scapular-system flaps, and other microvascular free-tissue options. Selection of reconstruction depends on defect size and depth, intraoral or external location, functional subunits, previous radiotherapy, recipient-vessel status, donor-site morbidity, and patient comorbidity. Modern free-flap reconstruction commonly achieves high flap survival rates, but local and regional flaps remain highly effective for appropriately selected small-to-moderate defects with lower operative burden. The reconstructive ladder remains clinically useful; however, contemporary decision-making should prioritize the best tissue match and functional restoration rather than simply escalating by defect size.

Keywords: maxillofacial reconstruction, soft-tissue defect, local flap, regional flap, free flap, microsurgery, ALT, RFFF, FAMM, donor-site morbidity.

KIRISH

Yuz-jag‘ sohasi anatomik va funksional jihatdan murakkab bo‘lib, yumshoq to‘qima nuqsonlari travma, o‘smalarni rezeksiya qilish, infeksiya, nekroz, tug‘ma



deformatsiya yoki oldingi jarrohlikdan keyin yuzaga kelishi mumkin. Ushbu hududda rekonstruksiyaning maqsadi faqat yara yuzasini yopish emas; ogʻiz boʻshligʻi germetikligini, lab kompetensiyasini, nutq va yutishni, yuz simmetriyasini, kontur va mimikani maksimal darajada tiklash zarur.

Rekonstruktiv jarrohlikning klassik “pogʻona” konsepsiyasi birlamchi yopishdan boshlab teri grafti, mahalliy flap, regional flap va mikrovaskulyar erkin flapga oʻtishni nazarda tutadi. Zamonaviy bosh-yuz rekonstruksiyasida esa “rekonstruktiv lift” yoki “eng mos toʻqima” konsepsiyasi muhimlashgan: murakkab nuqsonda ortiqcha oraliq bosqichlardan oʻtmasdan, kerakli hajm, qalinlik, epitelial qoplama va pedikul uzunligini taʼminlaydigan usul tanlanadi.

Mikrovaskulyar erkin toʻqima koʻchirib oʻtkazish bosh va boʻyin rekonstruksiyasining asosiy yutuqlaridan biri hisoblanadi. Sistematik sharhlarda erkin flaplarning umumiy muvaffaqiyati yuqori boʻlib, flap monitoringi va erta reviziya protokollari muvaffaqiyatni yanada oshiradi. Shu bilan birga, donor soha morbidligi, uzoq operatsiya va mikrojarrohlik resurslariga ehtiyoj sabab kichik defektlarda erkin flap har doim ham optimal emas.

Ushbu maqolaning maqsadi yuz-jagʻ sohasidagi yumshoq toʻqima nuqsonlarini rekonstruksiya qilishda qoʻllanadigan asosiy usullarni dalillar asosida taqqoslash, ularning klinik samaradorligi, funksional natijalari va donor soha bilan bogʻliq trade-offlarini aniqlash hamda amaliy tanlov algoritmini taklif etishdan iborat.

METODOLOGIYA VA ADABIYOTLAR TAHLILI

Ushbu ish strukturaviy narrativ sharh va analitik sintez sifatida bajarildi. PubMed/NCBI va ochiq kirishli ilmiy manbalardan 2021–2026-yillardagi sistematik sharhlar, meta-tahlillar va rekonstruktiv jarrohlik boʻyicha klinik sharhlar ustuvor tanlandi. Qidiruv tushunchalariga “maxillofacial soft tissue reconstruction”, “head and neck free flap”, “local flap”, “regional flap”, “FAMM flap”, “radial forearm free flap”, “anterolateral thigh flap”, “MSAP flap”, “donor site morbidity” va “free flap monitoring” kiritildi.

Kiritish mezonlari: yuz-jagʻ yoki bosh-boʻyin nuqsonlarining rekonstruksiyasiga bevosita aloqador, flap yashovchanligi, asoratlar, donor soha natijalari, nutq-yutish yoki estetik-funksional tiklanish haqida maʼlumot beruvchi klinik tadqiqotlar va sistematik sharhlar. Faqat laborator yoki hayvon modellari va yumshoq toʻqima rekonstruksiyasiga bilvosita aloqador manbalar chiqarib tashlandi.



Natijalar mahalliy flaplar, regional flaplar va erkin mikrovaskulyar flaplar bo'yicha guruhlandi. Birlamchi bemor ma'lumotlari mavjud bo'lmagani sababli muallif tomonidan sun'iy klinik foizlar yaratilmagan; diagrammadagi raqamlar nashr etilgan sistematik sharh va meta-tahlillarning umumlashtirilgan natijalariga tayangan.

NATIJALAR

Adabiyotlar sintezi rekonstruktiv usul tanlovida to'rtta asosiy omilni ajratdi: defektning uch o'lchamli hajmi va to'qima komponentlari; funksional subunit (lab, yonoq, til, og'iz tubi, burun, orbital/periorbital soha); mahalliy to'qima va tomirlarning holati; bemorning sistemik xavfi va donor soha morbidligi.

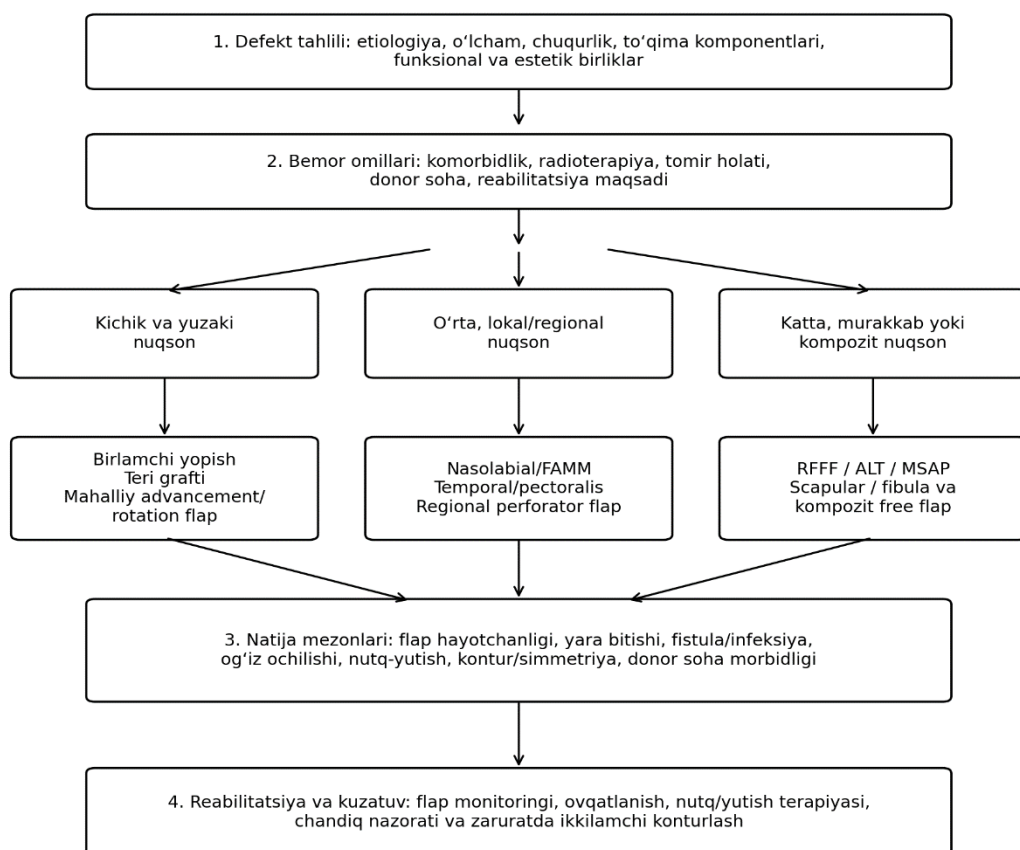
Usul	Optimal nuqson	Afzallik	Asosiy cheklov	Klinik o'rni
Birlamchi yopish	Kichik, tarangliksiz chetlari yaqin	Eng sodda; rang/to'qima bir xil	Taranglik va deformatsiya xavfi	Juda kichik nuqsonlarda
Teri grafiti	Yuzaki, yaxshi qonlangan yara	Tez, kam donor morbidligi	Kontur, rang va kontraktura muammosi	Yuzaki qoplama
Mahalliy flap	Kichik-o'rta yuz nuqsoni	Rang, qalinlik va tekstura mos	Geometriya va qo'shni subunit deformatsiyasi	Nasolabial, advancement, rotation, transposition
FAMM / regional flap	Intraoral, til, og'iz tubi, tanglay	Pedikulli, mikroanastomozs iz; "like-with-like"	Reach va hajm cheklangan	O'rta intraoral nuqsonlarda
RFFF	Yupqa, egiluvchan intraoral nuqson	Uzoq pedikul, ishonchli anatomiya	Bilak donor soha kosmetik/funksional morbidligi	Til, og'iz tubi, farinks
ALT	Katta yumshoq to'qima, hajm talab qiluvchi defekt	Katta teri oroli, qalinlikni moslash, donor soha yashirin	Perforator variatsiyasi, semiz bemorda qalin	Katta intra/ekstraoral nuqson



MSAP	Yupqa-o'rtacha, egiluvchan free flap	Donor soha ko'rinishi va funksiyasi yaxshi	Texnik murakkablik va kalibr kichikroq	RFFF/ALT alternativi
Scapular system	Katta/kompozit defekt	Ko'p komponentli, yaxshi pedikul anatomiyasi	Pozitsiya va harvest logistika	Murakkab kompozit rekonstruksiya

1-jadval. Yuz-jag' yumshoq to'qima nuqsonlarida asosiy rekonstruktiv usullarning qiyosiy tavsifi.

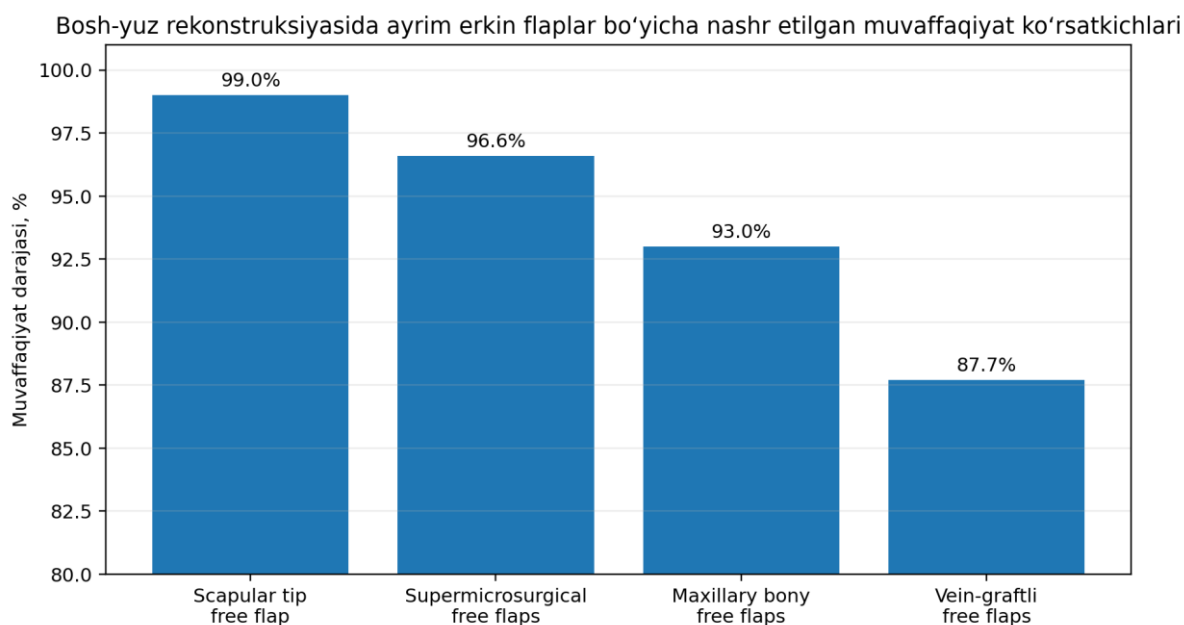
Yuz-jag' yumshoq to'qima nuqsonlarini rekonstruksiya qilish bo'yicha klinik algoritmi



1-rasm.
Rekonstruktiv
usul
tanlashning
klinik
algoritmi
(mualliflik
sxemasi).



Erkin flaplarning yashovchanligi bo'yicha zamonaviy adabiyotlar yuqori ishonchlilikni ko'rsatadi. Free flap monitoringiga oid sistematik sharh mikrovaskulyar transferlarda muvaffaqiyat ko'rsatkichlari taxminan 99% atrofida ekanini va taxminan 5% holatda tomir kompromissi sabab eksploratsiya talab qilinishini qayd etgan. Supermikrojarrohlik bo'yicha 47 tadqiqot va 698 flapni o'z ichiga olgan meta-tahlilda umumiy muvaffaqiyat 96,6% bo'lgan. Scapular tip free flap bo'yicha 23 tadqiqot va 474 bemorni qamrab olgan sistematik sharhda umumiy flap muvaffaqiyati 99% (95% CI 97–100) sifatida qayd etilgan. Murakkabroq, vein graft talab qilgan bosh-bo'yin free flaplarida esa meta-tahlil flap failure prevalensiyasini 12,3% deb baholagan, ya'ni taxminiy muvaffaqiyat 87,7% bo'lgan.



1-diagramma. Ayrim zamonaviy sistematik sharh va meta-tahlillarda erkin flaplarning umumlashtirilgan muvaffaqiyat ko'rsatkichlari. Turli populyatsiya va defektlar sabab ko'rsatkichlar to'g'ridan-to'g'ri randomizatsiyalangan taqqoslash emas.

Dalil	Namuna	Asosiy ko'rsatkich	Natija	Klinik talqin
Shen et al., 2021	Sistematik sharh	Free flap monitoring/salvage	Muvaffaqiyat ~99%; eksploratsiya ~5%	Erta monitoring va reviziya kritik



Supermicrosurger y meta-tahlili, 2022	47 tadqiqot, 698 flap	Flap success	96.6%; partial loss 3.84%	Kichik perforator asosli transferlar ishonchli
Scapular tip meta- tahlili, 2024	23 tadqiqot, 474 bemor	Flap success	99%; umumiy asorat 38%	Murakkab bosh- bo'yin defektlari uchun xavfsiz va versatile
MSAP sistematik sharhi, 2023	4 qiyosiy tadqiqot	Recipient/donor morbidity	Donor asorati 7.8% vs comparator 20.2%; nutq- yutish farqi yo'q	Donor soha afzalligi bilan RFFF/ALT alternativi
Vein-graft meta- tahlili, 2024	11 tadqiqot, 789 flap	Flap failure	12.3%	Tomir tanqis bo'yinlard a xavf yuqoriroq, ammo texnika amaliy

2-jadval. Rekonstruktiv flaplar bo'yicha tanlangan zamonaviy dalillar.

Donor soha morbidligi usul tanlashda ikkilamchi emas, asosiy mezonlardan biridir. MSAP flapni RFFF va ALT bilan taqqoslagan sistematik sharhda recipient-site asoratlari bo'yicha farq kichik bo'lgan, ammo donor-site asoratlari MSAP guruhida pastroq qayd etilgan (7,8% ga nisbatan 20,2%). Shu bilan birga nutq va yutish



funksiyasida statistik farq kuzatilmagan. Bu natija bir xil funksional rekonstruksiya mumkin bo'lgan vaziyatda donor sohani tejovchi variantni tanlash maqsadga muvofiqligini ko'rsatadi.

Mahalliy va regional flaplarning kuchli tomoni — mikrovaskulyar anastomoz talab qilmasligi, operatsiya davomiyligining qisqaligi va mos rang/teksturali qo'shni to'qimadan foydalanishidir.

Parotidektomiya defektlari bo'yicha zamonaviy sharh birlamchi yopish, autolog yog', acellular dermal matrix, mahalliy/regional flap va free tissue transfer variantlarining defekt hajmi va kontur talabiga qarab individual tanlanishini ta'kidlaydi. FAMM flap esa til, tanglay, alveolyar ridge va og'iz tubidagi o'rta hajmli nuqsonlarda mikroanastomozsiz rekonstruksiya imkonini beradi.

Klinik vaziyat	Afzal yondashuv	Sabab	Asosiy xavf/cheklov
Kichik yonoq/lab teri nuqsoni	Mahalliy advancement/rotation flap	Rang va tekstura eng yaxshi mos	Landmark tortilishi, ektropion/lab distorsiyasi
O'rta intraoral defekt	FAMM yoki boshqa regional flap	Yupqa, shilliq muhitga mos, mikrojarrohlisiz	Pedikul reach va hajm cheklovi
Keng til/og'iz tubi nuqsoni	RFFF yoki yupqa ALT/MSAP	Mobillik va shaklni tiklash uchun pliable to'qima	Donor soha va bulk muvozanati
Katta yonoq/bo'yin yumshoq to'qima yo'qotilishi	ALT	Katta teri oroli va hajm	Semiz bemorda qalin flap
Oldin irradiatsiya qilingan / vessel-depleted neck	Free flap, zaruratda vein graft yoki alternativ recipient vessel	Yaxshi qonlangan yangi to'qima olib kirish	Flap failure xavfi yuqoriroq, texnik murakkablik
Kompozit yuz-jag' nuqsoni	Scapular system yoki boshqa chimeric flap	Bir nechta to'qima komponentini bitta pedikul bilan	Operatsion logistika va tajriba talab qiladi



3-jadval. Klinik vaziyatga qarab rekonstruktiv usul tanlash matritsasi.

MUHOKAMA

Yuz-jag‘ yumshoq to‘qima rekonstruksiya qilishda “eng murakkab usul — eng yaxshi usul” degan qarash noto‘g‘ri. Kichik nuqsonni erkin flap bilan tiklash bemorga keraksiz mikrojarrohlik, donor soha va uzoq operatsiya yukini qo‘shishi mumkin. Xuddi shuningdek, katta uch o‘lchamli defektni faqat mahalliy to‘qima bilan yopishga urinish taranglik, kontraktura, kontur deformatsiyasi va funksional cheklanishga olib kelishi mumkin.

Mahalliy flaplar yuzda ayniqsa kuchli, chunki ular rang, qalinlik va tekstura jihatidan “like-with-like” rekonstruksiya qilishni ta‘minlaydi. Ammo facial estetik subunitlar buzilmasligi kerak: ko‘z qovog‘i, lab qirrasini, burun qanoti va nasolabial burma singari landmarklar millimetr darajasidagi tortilishga ham sezgir. Shu sabab flap dizayni nuqsonning o‘lchamidan ko‘ra tension vector va scar placement bilan ko‘proq belgilanadi.

Intraoral rekonstruksiya qilishda asosiy talablar boshqacha: flap yupqa, egiluvchan, nam muhitga chidamli va til harakatini cheklamaydigan bo‘lishi kerak. RFFF shu sabab tarixan “workhorse” flap bo‘lib kelgan. ALT esa katta to‘qima hajmi, pedikul variabelligi va donor sohaning nisbatan yashirinligi bilan kuchli. MSAP yuqoridagi ikkisi o‘rtasida donor morbidligini kamaytiruvchi yupqa perforator flap sifatida tobora ko‘proq e‘tibor olmoqda; sistematik sharhda nutq va yutish RFFF/ALT bilan taqqoslaganda farq qilmagan, donor soha natijalari esa yaxshiroq bo‘lgan.

Mikrovaskulyar free flapning yuqori survival rate ko‘rsatkichi uning “xavfsiz” ekanini bildiradi, lekin har bir yuqori survival rate funksional mukammallik degani emas. Flapning ortiqcha bulk‘i til harakatini, vestibulyar chuqurlikni yoki protezlashtirishni yomonlashtirishi mumkin; haddan tashqari yupqa flap esa kontur yetishmovchiligi va kontrakturaga olib keladi. Shuning uchun hajmni rekonstruksiya qilish bilan motor/funksional ehtiyoj o‘rtasida muvozanat zarur.

Oldin radioterapiya olgan, bir necha marta operatsiya qilingan yoki “vessel-depleted neck” bo‘lgan bemorlar alohida xavf guruhidir. Bunday holatlarda recipient tomir tanlovi, vein graft, pedikul yo‘li va monitoring rejasi oldindan rejalashtiriladi. Vein graft talab qiladigan bosh-bo‘yin free flaplarida failure ko‘rsatkichi odatiy holatlardan yuqoriroq bo‘lsa-da, zamonaviy meta-tahlil bu yondashuv tegishli indikatsiyada baribir ishonchli ekanini ko‘rsatadi.

Maqolaning cheklovi — u birlamchi klinik kohort emas va turli etiologiya, nuqson o‘lchami va flap turlarini o‘z ichiga olgan heterogen adabiyotlarni sintez qiladi. Shu



sabab jadval va diagrammalardagi ko'rsatkichlarni "bir flap ikkinchisidan mutlaq yaxshi" degan to'g'ridan-to'g'ri ranking sifatida talqin qilish noto'g'ri; ular klinik qaror uchun kontekst beradi.

XULOSA

Yuz-jag' sohasidagi yumshoq to'qima nuqsonlarini tiklashda optimal rekonstruksiya nuqson hajmi, funksional subunit, to'qima sifati, avvalgi davolash, donor soha va bemor xavfini birgalikda baholashga asoslanadi. Kichik va o'rta nuqsonlarda mahalliy yoki regional flaplar ko'pincha eng oqilona usul bo'lib, yaxshi rang-tekstura mosligi va kam operativ yuklama beradi.

Katta, chuqur, radiatsiya olgan yoki kompozit nuqsonlarda mikrovaskulyar free flap rekonstruksiyasi yuqori flap survival rate va katta dizayn erkinligi bilan asosiy usuldir. RFFF yupqa va pliable to'qima, ALT katta hajm, MSAP donor soha afzalligi, scapular tizim esa murakkab kompozit rekonstruksiya uchun foydali variantdir.

Klinik samaradorlikni baholashda faqat flapning tirik qolishi emas, balki nutq-yutish, lab kompetensiyasi, og'iz ochilishi, kontur, estetik simmetriya, donor soha funksiyasi va reabilitatsiya sifati asosiy yakuniy mezonlar bo'lishi kerak. Eng yaxshi rekonstruksiya — texnik jihatdan eng murakkabi emas, balki bemorning funksional va estetik ehtiyojlariga eng aniq mos keladigan usuldir.

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FEATURES OF CHOLECYSTECTOMY IN ELDERLY AND SENILE PATIENTS WITH SEVERE COMORBIDITIES

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Annotation: *This article analyzes the specific challenges of surgical treatment for cholelithiasis in geriatric patients presenting with advanced comorbidities (ischemic heart disease, COPD, diabetes mellitus). The risks associated with standard high-pressure carbon dioxide pneumoperitoneum, methods of preoperative optimization, and alternative minimally invasive strategies are explored. The study emphasizes the critical role of a multidisciplinary approach and the minimization of operative and anesthetic stress to decrease postoperative mortality.*

Key words: geriatric surgery, laparoscopic cholecystectomy, comorbidities, pneumoperitoneum, cholecystostomy, multimorbidity.

The aging global population drives a steady increase in the number of surgical interventions performed on elderly (60–74 years) and senile (75–89 years) individuals. Gallstone disease and its acute complications remain among the most frequent indications for urgent abdominal surgery in geriatrics. The defining characteristic of this patient cohort is multimorbidity, where a single patient commonly presents with 3 to 5 decompensated cardiovascular, respiratory, or metabolic conditions. Under these circumstances, anesthesia and surgical stress risks often outweigh the risks of the underlying disease, requiring a reevaluation of standard surgical protocols.

Results and Discussion

1. Adverse Systemic Effects of Standard Carboxypneumoperitoneum

During standard laparoscopic cholecystectomy (LC), carbon dioxide (CO₂) is insufflated into the peritoneal cavity to create a clear working field. In elderly patients with severe cardiopulmonary compromise, standard gas pressure (12–14 mmHg) causes severe, potentially dangerous systemic responses:

- **Cardiovascular Impacts:** Elevated intra-abdominal pressure restricts venous return to the heart, increases left ventricular afterload, and can precipitate acute heart failure, myocardial infarction, or severe arrhythmias in patients with underlying CAD or arterial hypertension.



- **Respiratory Impacts:** Cephalad displacement of the diaphragm diminishes lung volumes. Against a background of preexisting COPD or pulmonary fibrosis, this causes profound hypercapnia, hypoxemia, and acute respiratory distress.

2. Surgical and Tactical Adaptations

To mitigate operative risks in geriatric care, specific surgical modifications are utilized:

- **Low-Pressure Laparoscopy:** Performing the LC at gas pressures of 8–10 mmHg. This significantly limits hemodynamic instability, although it demands superior technical precision due to a slightly reduced operative space.
- **Gasless (Lifting) Laparoscopy:** Utilizing mechanical abdominal wall retractors completely avoids the systemic side effects associated with CO₂ insufflation.
- **Two-Stage Treatment (Damage Control Concept):** In critically ill, somatically unstable patients (e.g., destructive cholecystitis compounded by decompensated heart failure), an immediate cholecystectomy is contraindicated.
 - *Stage 1:* Ultrasound-guided percutaneous transhepatic cholecystostomy (PTC) to decompress, drain, and resolve gallbladder inflammation.
 - *Stage 2:* Elective definitive cholecystectomy performed once the patient's physiological status has been optimized.

3. Postoperative Recovery Nuances

The rehabilitation period in geriatric patients is characterized by delayed tissue healing and a high susceptibility to hypostatic complications (thromboembolism, hypostatic pneumonia, and postoperative cognitive dysfunction/delirium). Early mobilization within the first postoperative hours, aggressive non-opioid pain management, and tailored anticoagulant therapy are mandatory core components of care.

Conclusion

Performing a cholecystectomy in elderly and senile patients mandates a highly customized approach that diverges from standard adult protocols. Low-pressure



laparoscopy remains the treatment of choice for the majority of comorbid individuals. In critically unstable cases, a delayed two-stage strategy utilizing initial percutaneous gallbladder drainage provides a safer pathway, minimizing immediate surgical trauma and safeguarding patient outcomes.

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AMIR TEMUR DAVRIDA DAVLAT BOSHQARUVI VA HARBIY TIZIM

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ANNOTATSIYA:

Ushbu maqolada Amir Temur (1370–1405) tomonidan barpo etilgan markazlashgan davlatning boshqaruv tizimi, ma'muriy-hududiy tuzilishi va harbiy qurilishi ilmiy asosda tahlil qilinadi. Maqolada “Temur tuzuklari”ga asoslangan davlat boshqaruvi tamoyillari, devonlar tizimi, o'nlik harbiy tuzilma, qo'shinning tashkiliy tuzilishi va jangovar strategiyasi masalalari yoritiladi.

Kalit so'zlar: Amir Temur, Temuriylar davlati, davlat boshqaruvi, devon, harbiy tizim, o'nlik tuzilma, Temur tuzuklari, markazlashgan hokimiyat.

KIRISH

XIV asrning ikkinchi yarmida Movarounnahrda vujudga kelgan Amir Temur davlati o'rta asrlar Sharq davlatchiligi tarixida alohida o'rin tutadi. Amir Temur nafaqat yirik sarkarda va davlat arbobi, balki puxta o'ylangan boshqaruv tizimini yaratgan islohotchi hukmdor sifatida ham tarixda o'chmas iz qoldirdi. U barpo etgan davlat boshqaruv mexanizmi markazlashgan hokimiyat, aniq ma'muriy-hududiy bo'linish va yaxshi tashkil etilgan harbiy tuzilmaga asoslangan edi. Ushbu maqolada Amir Temur davlatining boshqaruv tizimi, uning tarkibiy qismlari, shuningdek qo'shinning tuzilishi va harbiy san'at masalalari ko'rib chiqiladi.

1. Amir Temur davlatining boshqaruv tizimi

Amir Temur davlati markazlashgan monarxiya shaklida tashkil topgan bo'lib, unda oliy hokimiyat to'liq sobiqqiron qo'lida jamlangan edi. Biroq bu hokimiyat o'zboshimchalik asosida emas, balki aniq huquqiy-me'yoriy hujjat — “Temur tuzuklari”da bayon etilgan qoidalar asosida amalga oshirilgan. Tuzuklarda davlatni boshqarishning o'n ikkita asosiy tamoyili, amirlar, vazirlar va boshqa amaldorlarning vazifalari, mansabga tayinlash tartibi aniq belgilab qo'yilgan edi. Bunday yondashuv davlat boshqaruvida tartib-intizomni ta'minlash va o'zboshimchalikning oldini olishga xizmat qilgan.

Davlat boshqaruvining markaziy bo'g'ini bo'lib devonlar tizimi xizmat qilgan. Oliy devon — Devoni oliy davlatning umumiy siyosatini belgilagan, unga sobiqqironning o'zi rahbarlik qilgan. Undan tashqari, moliya ishlari bilan Devoni



mol, harbiy ishlar bilan Devoni arz, yer-mulk masalalari bilan Devoni buzurg kabi maxsus devonlar shug'ullangan. Har bir devon o'z tarkibida kotiblar, bitikchilar va mahalliy vakolatli amaldorlarga ega bo'lib, ular orqali markaziy hokimiyat qarorlari o'lka miqyosida amalga oshirilgan.

2. Ma'muriy-hududiy boshqaruv

Amir Temur o'z davlatini boshqarishda hududiy bo'linishga alohida e'tibor qaratgan. Davlat bir necha yirik viloyatlarga bo'lingan bo'lib, ularni boshqarish sohibqironning yaqin qarindoshlari, ishonchli amirlari yoki tajribali sarkardalariga topshirilgan. Bunday tizim, bir tomondan, mahalliy boshqaruvni tezkor va samarali amalga oshirishga xizmat qilgan bo'lsa, ikkinchi tomondan, markaziy hokimiyatning nazoratini kuchaytirish vazifasini ham bajargan. Har bir viloyat hokimi markazga hisobot berish, soliqlarni yig'ish va zarur hollarda harbiy kuch safarbar etish majburiyatiga ega edi.

Davlat boshqaruvida adolat masalasiga ham katta ahamiyat berilgan. Amir Temur tuzuklarida qayd etilishicha, hukmdor har kuni fuqarolarning shikoyatlarini shaxsan tinglagan va adolatli hukm chiqarishga harakat qilgan. Qozilar tizimi orqali shariat va urf-odat normalariga asoslangan sud ishlari yuritilgan, bu esa jamiyatda huquqiy tartibni mustahkamlashga xizmat qilgan.

3. Harbiy tizimning tashkil etilishi

Amir Temur qo'shinni tashkil etishda qadimiy turkiy-mo'g'ul harbiy an'analariga asoslangan o'nlik tizimdan foydalangan. Qo'shin o'nlik, yuzlik, minglik va tumanlarga (o'n minglik) bo'lingan bo'lib, har bir bo'linma o'ziga tegishli qo'mondonga bo'ysungan. Bunday ierarxik tuzilma qo'shinni boshqarishni yengillashtirgan, jang paytida buyruqlarning tezkor yetkazilishini ta'minlagan hamda intizomni yuqori darajada saqlashga imkon bergan.

Qo'shin tarkibi otliq va piyoda qismlarga, shuningdek og'ir qurollangan va yengil qurollangan bo'linmalarga ajratilgan. Otliq lashkar asosiy zarba kuchi hisoblanib, jangovar harakatlarning asosiy og'irligini o'z zimmasiga olgan. Qo'shin safiga muhandislik qismlari — qamal qurollarini boshqaruvchi mutaxassislar, ko'prik va yo'l qurish bilan shug'ullanuvchi guruhlar ham kiritilgan, bu esa Amir Temur armiyasining texnik jihatdan yuksak darajada ta'minlanganidan dalolat beradi.

4. Harbiy strategiya va jangovar mahorat

Amir Temurning harbiy yurishlaridagi muvaffaqiyati nafaqat qo'shinning son jihatidan ustunligi, balki puxta o'ylangan strategiya va taktikaga asoslanganligi bilan izohlanadi. U dushman kuchlarini oldindan sinchiklab o'rganish, razvedka



ma'lumotlaridan unumli foydalanish, jang maydonini to'g'ri tanlash kabi usullarni keng qo'llagan. Jang paytida qo'shinni markaziy qism, o'ng va chap qanotlarga, hamda ehtiyot kuchlarga bo'lib joylashtirish, dushmani o'rab olish (qamrab olish) taktikasi Amir Temur qo'shinining o'ziga xos jangovar uslubini tashkil etgan.

Amir Temur armiyasida intizom va harbiy tayyorgarlikka juda katta e'tibor qaratilgan. Har bir jangchi o'z qurol-aslahasi va oti bilan safarbarlik holatida bo'lishi shart edi, aks holda qattiq jazoga tortilgan. Bunday qat'iy talablar qo'shinning doimiy jangovar tayyorligini ta'minlagan. Shuningdek, g'animat taqsimoti, harbiy xizmat uchun mukofotlash tizimi ham aniq tartibga solingan bo'lib, bu jangchilarning jangovar ruhini yuksaltirishga xizmat qilgan.

5. Davlat boshqaruvi va harbiy tizimning o'zaro bog'liqligi

Amir Temur davlatida boshqaruv va harbiy tizim bir-biri bilan uzviy bog'liq holda faoliyat yuritgan. Ko'plab yirik amirlar va viloyat hokimlari ayni paytda harbiy qo'mondonlik vazifasini ham bajargan, bu esa fuqarolik va harbiy boshqaruvni birlashtirib, davlatning istalgan vaziyatda tezkor safarbarlik qobiliyatini ta'minlagan. Soliq tizimi ham ko'p jihatdan harbiy ehtiyojlarni qondirishga xizmat qilgan — yig'ilgan mablag'larning katta qismi qo'shinni ta'minlash, qurol-yarog' ishlab chiqarish va harbiy inshootlar qurilishiga sarflangan.

Bunday uyg'unlashgan tizim natijasida Amir Temur qisqa muddat ichida Movarounnahrda tortib Kichik Osiyo, Eron, Iroq, Hindistonning shimoliy qismigacha bo'lgan ulkan hududlarni o'z ta'siriga bo'ysundirishga muvaffaq bo'ldi. Shu bilan birga, bosib olingan hududlarda ham markaziy davlat andozasidagi boshqaruv tamoyillari joriy etilib, bu Temuriylar imperiyasining barqarorligini ta'minlovchi omillardan biriga aylandi.

6. Qo'shinni ta'minlash va logistika tizimi

Amir Temur davlatida qo'shinning jangovar faoliyati faqat tashkiliy tuzilma va strategiya bilangina emas, balki puxta yo'lga qo'yilgan ta'minot tizimi bilan ham bog'liq edi. Uzoq masofali yurishlarni amalga oshirish uchun oldindan ozuqa ombori tashkil etish, karvon yo'llarini nazorat qilish va suv manbalaridan foydalanish masalalari alohida rejalashtirilgan. Har bir yurish oldidan razvedka guruhlarini yuborilib, yo'l xaritasi, iqlim sharoiti va dushman kuchlari haqida batafsil ma'lumot to'plangan. Bu esa qo'shinning uzoq masofalarga tez va samarali harakatlanishini ta'minlagan.

Harbiy ustaxonalar tizimi ham davlatning muhim tarkibiy qismi bo'lgan. Yirik shaharlarda qurol-yarog' ishlab chiqaruvchi ustaxonalar faoliyat yuritgan bo'lib, ularda qilich, nayza, o'q-yoy, shuningdek qamal texnikasi — manjaniq va boshqa



otar qurollar tayyorlangan. Temir-tersak ustalari, o'qchilar va boshqa hunarmandlar davlat homiyligida ishlab, qo'shinning zamonaviy qurol-aslaha bilan ta'minlanishiga xizmat qilgan. Bunday yondashuv Amir Temur armiyasini davr uchun yuqori texnik salohiyatga ega qo'shinlardan biriga aylantirgan.

7. Boshqaruv va harbiy tizimning tarixiy ahamiyati

Amir Temur tomonidan yaratilgan davlat boshqaruvi va harbiy tizim nafaqat o'z davrida, balki undan keyingi asrlarda ham Markaziy Osiyo va qo'shni mintaqalar davlatchiligiga sezilarli ta'sir ko'rsatdi. Temuriylar sulolasi vakillari, jumladan Shohruh Mirzo, Ulug'bek va boshqalar davlatni boshqarishda ko'p jihatdan Amir Temur tomonidan ishlab chiqilgan tamoyillarga tayanishgan. Bobur tomonidan Hindistonda barpo etilgan Boburiylar imperiyasida ham markaziy boshqaruv, devonlar tizimi va harbiy tashkilotning ko'pgina unsurlari Amir Temur davridagi andozalar asosida shakllantirilgan.

Zamonaviy tarixshunoslikda Amir Temur davlatining boshqaruv tizimi o'rta asr Sharq davlatchiligining yuksak namunasi sifatida baholanadi. Tadqiqotchilar ta'kidlashicha, markaziy hokimiyat bilan mahalliy boshqaruv o'rtasidagi muvozanat, aniq huquqiy-me'yoriy asosga ega bo'lgan boshqaruv tizimi hamda yaxshi tashkil etilgan harbiy tuzilma Amir Temur davlatining nisbatan qisqa vaqt ichida ulkan hududlarni birlashtirishga va uzoq muddat barqaror boshqarishga imkon bergan asosiy omillar hisoblanadi. Bugungi kunda ham ushbu meros O'zbekiston davlatchiligi tarixini o'rganishda muhim manba va milliy g'urur manbai bo'lib xizmat qilmoqda.

8. Boshqaruvda kadrlar tanlash va mansab tizimi

Amir Temur davlatida amaldorlarni tanlash va mansabga tayinlash masalasiga alohida e'tibor qaratilgan. Tuzuklarda ta'kidlanishicha, yuqori lavozimlarga faqat aql-idrokli, sadoqatli va tajribali kishilar tayinlanishi lozim bo'lgan, mansab meros yoki qarindoshlik asosida emas, balki shaxsiy layoqat va xizmatlarga qarab berilgan. Bu tamoyil davlat apparatining nisbatan samarali va professional tarzda faoliyat yuritishini ta'minlagan. Har bir amaldor o'z vazifasi doirasida javobgar bo'lib, vazifasini suiiste'mol qilgan taqdirda qattiq jazoga tortilgan.

Harbiy sohada ham xuddi shunday tamoyil amal qilgan — sarkardalik lavozimlariga jangda ko'rsatgan mahorati va sodiqligi bilan ajralib turgan jangchilar ko'tarilgan. Bunday amaliyot qo'shin safida raqobat muhitini yaratib, jangchilarning shaxsiy mahoratini oshirishga undagan. Shu bilan birga, Amir Temur o'zining eng yaqin va ishonchli amirlarini nazorat qilish maqsadida ularni tez-tez almashtirib turish, turli



viloyatlarga yuborish siyosatini ham qo'llagan, bu esa ayrim amirlarning haddan tashqari kuchayib ketishining oldini olgan.

9. Fuqarolik va harbiy hokimiyat o'rtasidagi muvozanat

Amir Temur davlatida fuqarolik boshqaruvi va harbiy hokimiyat o'rtasida o'ziga xos muvozanat saqlangan. Tinch davrda devonlar orqali amalga oshirilgan fuqarolik boshqaruvi soliq yig'ish, sug'orish tizimini nazorat qilish, savdo-hunarmandchilikni rivojlantirish kabi vazifalarni bajargan bo'lsa, harbiy xavf tug'ilgan yoki yangi yurish boshlanganda davlat resurslarining katta qismi harbiy ehtiyojlarga safarbar etilgan. Bunday moslashuvchan tizim davlatga tinchlik davrida iqtisodiy rivojlanishni ta'minlash bilan bir qatorda, zarur bo'lganda qisqa muddat ichida katta harbiy kuchni safarbar etish imkonini bergan.

Shuningdek, Amir Temur diniy va ilmiy doiralar bilan ham yaqin aloqada bo'lib, ularning nufuzidan davlat boshqaruvini mustahkamlashda foydalangan. Ulamolar, shayxlar va olimlarga alohida hurmat ko'rsatilib, ular ba'zan hukmdor bilan xalq o'rtasida vositachilik vazifasini ham bajargan. Bu esa markaziy hokimiyatning jamiyat tomonidan qo'llab-quvvatlanishini ta'minlashda muhim omil bo'lgan.

10. Xulosa o'rnida umumlashtiruvchi mulohazalar

Amir Temur davlatining boshqaruv va harbiy tizimini o'rganish shuni ko'rsatadiki, muvaffaqiyatli davlatchilikning asosiy garovi kuchli markaziy hokimiyat, aniq huquqiy asosga ega boshqaruv mexanizmi va yaxshi tashkil etilgan qurolli kuchlarning uyg'un birikuvidadir. Sohibqironning boshqaruv falsafasida kuch va adolat tushunchalari uzviy bog'langan bo'lib, bu tamoyil davlatning ham ichki barqarorligini, ham tashqi qudratini ta'minlagan. Zamonaviy davlat qurilishi nuqtai nazaridan qaraganda, markazlashgan boshqaruv bilan mahalliy vakolatlarni oqilona taqsimlash, kadrlar siyosatida layoqat tamoyiliga amal qilish kabi jihatlar bugungi kunda ham o'z ahamiyatini yo'qotmagan.

Shu bois Amir Temur davri davlat boshqaruvi va harbiy tizimini har tomonlama va chuqur o'rganish nafaqat milliy tarixni bilish, balki davlat boshqaruvi nazariyasi va amaliyoti sohasida ham muhim ilmiy-amaliy ahamiyat kasb etadi. Kelgusi tadqiqotlarda ushbu mavzuni arxiv hujjatlari va qiyosiy tahlil usullari asosida yanada chuqurroq yoritish dolzarb vazifalardan biri bo'lib qolmoqda.

XULOSA

Xulosa qilib aytganda, Amir Temur davrida shakllangan davlat boshqaruvi va harbiy tizim o'rta asr Sharq davlatchiligi tarixidagi eng mukammal tizimlardan biri hisoblanadi. "Temur tuzuklari"ga asoslangan boshqaruv tamoyillari, devonlar orqali



amalga oshirilgan markaziy nazorat, aniq ma'muriy-hududiy bo'linish, shuningdek o'nlik tizimga asoslangan yaxshi tashkil etilgan qo'shin — bularning barchasi Amir Temur davlatining kuchli va barqaror bo'lishini ta'minlagan asosiy omillardir. Ushbu tizimning ko'pgina jihatlari keyingi davr davlatchilik an'alariga, jumladan Boburiylar imperiyasi boshqaruv tizimiga ham sezilarli ta'sir ko'rsatgan. Amir Temur merosini o'rganish nafaqat tarixiy ahamiyatga, balki zamonaviy davlat boshqaruvi va harbiy qurilish sohalarida ham muayyan amaliy qiziqishga ega.

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JADIDCHILIK HARAKATI VA MILLIY UYG‘ONISH DAVRI

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ANNOTATSIYA

Ushbu maqolada XIX asr oxiri – XX asr boshlarida Turkiston va Buxoro, Xiva xonliklari hududida yuzaga kelgan jadidchilik harakatining paydo bo‘lish sabablari, mohiyati, asosiy yo‘nalishlari va uning milliy uyg‘onish jarayoniga ta’siri tahlil qilinadi. Jadid maktablari, matbuoti, adabiyoti hamda jadid mutafakkirlarining ma’rifatparvarlik faoliyati yoritilib, ushbu harakatning o‘zbek xalqi milliy o‘z-o‘zini anglash jarayonidagi o‘rni va tarixiy ahamiyati ochib beriladi. Tadqiqotda tarixiy-qiyosiy va sabab-oqibat tahlili usullaridan foydalanilgan.

Kalit so‘zlar: jadidchilik, milliy uyg‘onish, ma’rifatparvarlik, usuli jadid maktablari, Turkiston, Buxoro amirligi, milliy matbuot, islohotchilik, ma’naviy yuksalish.

KIRISH

Har bir xalqning tarixida shunday davrlar bo‘ladiki, ular millatning kelajak taqdirini belgilab beruvchi burilish nuqtasiga aylanadi. O‘zbek xalqi tarixida XIX asrning ikkinchi yarmi va XX asr boshlari aynan shunday davr bo‘lib, bu davrda mintaqaxalqlari ijtimoiy-siyosiy, iqtisodiy va ma’naviy inqiroz bilan bir qatorda, ulkan uyg‘onish jarayonini ham boshdan kechirdi. Rossiya imperiyasi tomonidan Turkiston o‘lkasining bosib olinishi, Buxoro va Xiva xonliklarining vassal holatga tushib qolishi mahalliy xalqlarni chuqur mulohaza yuritishga, o‘z ahvolining sabablarini izlashga undadi. Aynan shu sharoitda ma’rifatparvar ziyolilar qatlami shakllanib, jadidchilik nomi bilan tarixga kirgan islohotchilik-ma’rifatparvarlik harakati vujudga keldi.

Jadidchilik harakati faqat maktab-maorif sohasidagi islohotlar bilan chegaralanmay, balki millatning ijtimoiy ongini, siyosiy dunyoqarashini va madaniy hayotini tubdan yangilashga qaratilgan keng ko‘lamli ijtimoiy-ma’rifiy jarayon edi. Ushbu maqolada jadidchilik harakatining kelib chiqish sabablari, uning g‘oyaviy asoslari, amaliy faoliyat yo‘nalishlari hamda milliy uyg‘onish davridagi o‘rni yoritiladi.



1. Jadidchilik harakatining vujudga kelish sabablari

Jadidchilik harakatining paydo bo'lishiga bir qator ichki va tashqi omillar sabab bo'ldi. Birinchidan, Turkiston o'lkasining Rossiya imperiyasi tarkibiga qo'shib olinishi (1865–1876-yillar) mintaqaning ijtimoiy-siyosiy tuzumini tubdan o'zgartirdi. Mahalliy xalq mustamlaka siyosatining og'ir oqibatlarini his qildi: yer-suv resurslaridan mahrum bo'lish, paxta yakkahokimligining o'rnatilishi, mahalliy sanoat va hunarmandchilikning inqirozga yuz tutishi kabi jarayonlar xalq turmush darajasining pasayishiga olib keldi.

Ikkinchidan, o'lkadagi ta'lim tizimi qadimgi, sxolastik uslubda qolib ketgan edi. Eski usul maktablarida bolalar yillar davomida arab alifbosini yodlashga sarflar, aniq fanlar, tabiiy-ilmiy bilimlar deyarli o'qitilmasdi. Bu esa yosh avlodning zamon talablariga mos bilim olishiga to'sqinlik qilardi. Uchinchidan, XIX asr oxirida Qrim tatarlari, Ozarbayjon va boshqa turkiy xalqlar orasida boshlangan ma'rifatparvarlik g'oyalari, xususan, Ismoilbek Gasprinskiyning "usuli jadid" ta'lim islohoti Turkiston ziyolilariga sezilarli ta'sir ko'rsatdi.

To'rtinchidan, savdo-sotiq va ziyorat maqsadida chet elga, xususan Turkiya, Misr, Hindiston va Yevropa mamlakatlariga borgan mahalliy savdogarlar hamda ziyolilar u yerdagi ijtimoiy-iqtisodiy taraqqiyotni ko'rib, o'z vatanlarining orqada qolganligini his qildilar. Ana shu obyektiv va subyektiv omillar yig'indisi natijasida XIX asrning 90-yillaridan boshlab Turkistonda yangi tafakkurli, isloh talab qiluvchi ziyolilar guruhi shakllana boshladi.

2. Jadidchilik g'oyalarining mohiyati va asosiy yo'nalishlari

Jadidchilik harakati vakillari o'z faoliyatlarini bir necha asosiy yo'nalishda olib bordilar. Birinchi yo'nalish – ta'lim-tarbiya sohasidagi islohotlar bo'lib, bu yo'nalish "usuli jadid", ya'ni yangi usul nomini olgan va harakatning nomlanishiga ham asos bo'lgan. Ikkinchi yo'nalish – milliy matbuot va adabiyotni rivojlantirish orqali xalq ongini uyg'otish edi. Uchinchisi yo'nalish – ijtimoiy-siyosiy islohotlar, jumladan, boshqaruv tizimini takomillashtirish, adolat va qonuniylikni ta'minlash g'oyalari bo'lib, bu ayniqsa Buxoro va Xiva xonliklarida "yosh buxoroliklar" va "yosh xivaliklar" harakatlari shaklida namoyon bo'ldi.

Jadidlar milliy uyg'onishni uch asosiy ustunga tayangan holda tasavvur qilishardi: ilm-ma'rifat, iqtisodiy mustaqillik va milliy o'zlikni anglash. Ular xalqning og'ir ahvolidan qutulishining yagona yo'li zamonaviy bilimlarni egallash, sanoat va savdoni rivojlantirish hamda millat sifatida birlashish ekanligini targ'ib qilishdi. Shu bilan birga, jadidlar diniy qadriyatlarni butunlay rad etmagan holda,



islom ta'limotini zamon talablari bilan uyg'unlashtirishga intildilar, bu esa ularni konservativ ruhoniylar tomonidan tanqidga uchratdi.

3. Jadid maktablari va ta'lim-tarbiya islohotlari

Jadid maktablarining vujudga kelishi harakatning eng ko'zga ko'ringan va amaliy natija bergan yo'nalishi bo'ldi. 1893-yilda Toshkentda ochilgan birinchi usuli jadid maktablaridan boshlab, keyinchalik Samarqand, Buxoro, Xiva, Andijon, Namangan kabi shaharlarda o'nlab yangi usul maktablari tashkil etildi. Bu maktablarning eski maktablardan farqi shunda ediki, ularda ovoz usuli (tovush-harf mosligi) asosida o'qitish joriy qilindi, bu esa savodxonlikni bir necha oy ichida egallash imkonini berdi, aniq fanlar – arifmetika, geografiya, tabiatshunoslik kabi darslar o'qitildi, sinf-dars tizimi, partalar, doska va darsliklar qo'llanildi.

Jadid maktablari uchun maxsus darsliklar ham yaratildi. Bu borada Munavvarqori Abdurashidxonov, Abdulla Avloniy, Saidrasul Saidazizov kabi ma'rifatparvarlarning xizmati beqiyos bo'ldi. Ular "Adibi avval", "Adibi soniy", "Birinchi muallim" kabi darsliklar tuzib, yosh avlodni zamonaviy bilim asoslari bilan qurollantirdilar. Shuningdek, jadidlar qiz bolalar ta'limiga ham e'tibor qaratib, ayrim shaharlarda qizlar uchun maxsus maktablar ochishga harakat qildilar, bu o'sha davr uchun o'ta ilg'or qadam edi.

4. Jadid matbuoti va adabiyoti

Milliy matbuotning rivojlanishi jadidchilik harakatining muhim yutuqlaridan biri bo'ldi. 1906–1917-yillar oralig'ida "Taraqqiy", "Xurshid", "Shuhrat", "Sadoi Turkiston", "Sadoi Farg'ona", "Oyna" kabi gazeta va jurnallar nashr etildi. Ushbu nashrlar orqali jadidlar xalqqa ilm-ma'rifat zarurligini, iqtisodiy va ijtimoiy islohotlar ahamiyatini, milliy birlik g'oyasini yetkazishga harakat qilishdi. Mahmudxo'ja Behbudiy tomonidan asos solingan "Oyna" jurnali o'z davrining eng nufuzli ilmiy-ma'rifiy nashrlaridan biriga aylandi.

Jadid adabiyoti ham o'ziga xos yo'nalishda rivojlandi. Bu davr adabiyotida ijtimoiy-siyosiy mavzular, millat taqdiri, jaholat va nodonlikka qarshi kurash, ilm-ma'rifat targ'iboti asosiy o'rinni egalladi. Mahmudxo'ja Behbudiyning "Padarkush" dramasi o'zbek dramaturgiyasining ilk namunasi sifatida sahna yuzini ko'rdi va jaholat oqibatlarini fojiali tarzda ko'rsatib berdi. Abdulla Qodiriy, Abdurauf Fitrat, Cho'lpon, Hamza Hakimzoda Niyoziy kabi ijodkorlar o'z asarlarida millat kelajagi, ma'rifat va ozodlik g'oyalarini badiiy ifodaladilar.

5. Milliy uyg'unish davrining ijtimoiy-siyosiy jarayonlari



Jadidchilik harakati faqat ma'rifiy-madaniy doira bilan chegaralanmay, tobora ijtimoiy-siyosiy tus ola bordi. 1917-yilgi voqealardan so'ng jadidlar Turkiston avtonomiyasini e'lon qilish (Qo'qon muxtoriyati) kabi siyosiy harakatlarda faol ishtirok etdilar. Buxoro amirligida esa "yosh buxoroliklar" harakati amirlik boshqaruvini isloh qilish, konstitutsiyaviy tuzum o'rnatish g'oyalarini ilgari surdi. Bu jarayonlar millatning nafaqat ma'rifiy, balki siyosiy jihatdan ham uyg'onayotganidan dalolat berardi.

Afsuski, sovet hokimiyati o'rnatilgandan so'ng jadidchilik harakati vakillarining ko'pchiligi ta'qib ostiga olindi, ularning aksariyati 1920–1938-yillarda "millatchi", "xalq dushmani" degan aybnomalar bilan qatag'on qilindi. Shunga qaramay, ular tomonidan olib borilgan ma'rifatparvarlik ishlari, yaratilgan madaniy-ilmiy meros o'zbek xalqining milliy o'z-o'zini anglash jarayonida o'chmas iz qoldirdi.

6. Jadidchilik namoyandalari va ularning merosi

Jadidchilik harakatining yetakchi namoyandalari orasida Mahmudxo'ja Behbudiy, Munavvarqori Abdurashidxonov, Abdurauf Fitrat, Abdulla Avloniy, Abdulla Qodiriy, Cho'lpon, Ubaydulla Xo'jayev, Fayzulla Xo'jayev kabi shaxslarni alohida ta'kidlash lozim. Har biri o'z sohasida — ta'lim, matbuot, adabiyot, siyosat — millat manfaati yo'lida faoliyat yuritdi. Ular Yevropa va Rossiyaning ilg'or tajribasini o'rganish bilan bir qatorda, milliy qadriyatlarni saqlab qolish zarurligini ham unutmadilar, bu esa jadidchilikni sof taqlidchilik emas, balki ongli, tanlangan yo'l sifatida belgilaydi.

Bugungi kunda mustaqil O'zbekistonda jadid bobolarimiz merosi qayta o'rganilmoqda, ularning nomlari abadiylashtirilib, asarlari qayta nashr etilmoqda. Bu esa milliy tariximizning uzilgan sahifalarini tiklash, yosh avlodni vatanparvarlik ruhida tarbiyalash borasida muhim ahamiyat kasb etmoqda.

7. Jadidchilikning tarixiy ahamiyati

Jadidchilik harakatining tarixiy ahamiyatini quyidagi jihatlarda ko'rish mumkin. Birinchidan, u o'zbek xalqi ongida ilk bor zamonaviy ta'lim va ilm-fan qadriyatlarini shakllantirdi. Ikkinchidan, milliy matbuot va adabiyotning rivojlanishiga asos soldi, bu esa keyingi avlodlar uchun madaniy-ma'naviy meros yaratdi. Uchinchidan, millat sifatida birlashish, o'z taqdirini o'zi belgilash g'oyasini xalq ongiga singdirdi, bu g'oyalar keyinchalik XX asr davomida milliy istiqlol harakatlarining ma'naviy zaminiga aylandi.

Shuningdek, jadidchilik tajribasi shuni ko'rsatadiki, har qanday jamiyatning taraqqiyoti, avvalambor, uning ta'lim tizimi va ziyolilar qatlamining faolligiga



bogʻliqdir. Mustaqillik yillarida Oʻzbekistonda amalga oshirilayotgan taʼlim islohotlari, maʼnaviyat va maʼrifatni yuksaltirish borasidagi davlat siyosati koʻp jihatdan jadidchilik gʻoyalarining zamonaviy davomi sifatida baholanishi mumkin.

XULOSA

Xulosa qilib aytganda, jadidchilik harakati XIX asr oxiri – XX asr boshlarida Turkiston, Buxoro va Xiva hududida yuzaga kelgan chuqur ijtimoiy-maʼrifiy zaruratning natijasi boʻlib, u millatning taʼlim, matbuot, adabiyot va ijtimoiy-siyosiy hayotini tubdan yangilashga xizmat qildi. Ushbu harakat vakillari ilm-maʼrifat, milliy birlik va taraqqiyot gʻoyalarini xalq ongiga singdirish orqali oʻzbek xalqining milliy uygʻonish jarayoniga ulkan hissa qoʻshdilar. Jadidlarning gʻoyaviy merosi bugungi kunda ham oʻz ahamiyatini yoʻqotmagan boʻlib, u yosh avlodni vatanparvarlik, ilmga muhabbat va milliy gʻurur ruhida tarbiyalashda muhim manba boʻlib xizmat qilmoqda.

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**OLIY TA'LIM AXBOROT TIZIMI MA'LUMOTLARI
ASOSIDA AKADEMIK XAVF GURUHIDAGI
TALABALARNI MASHINAVIY O'QITISH YORDAMIDA
ERTA ANIQLASH**

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Annotatsiya. *Maqolada oliy ta'lim muassasalarida talabalarning akademik qarzdorlik va o'qishdan chetlashtirilish xavfini erta aniqlash muammosi ko'rib chiqilgan. HEMIS axborot tizimida to'planadigan baholash, davomat va o'quv faolligi ma'lumotlaridan foydalangan holda mashinaviy o'qitishga asoslangan erta ogohlantirish tizimi modeli taklif etilgan. Modelni qurish bosqichlari, belgilarni tanlash, algoritmlarni baholash mezonlari hamda shaxsga doir ma'lumotlarni himoya qilish masalalari yoritilgan.*

Kalit so'zlar: *HEMIS, mashinaviy o'qitish, ta'lim analitikasi, erta ogohlantirish tizimi, akademik qarzdorlik, gradiyentli busting, SHAP.*

Аннотация. *В статье рассматривается проблема раннего выявления риска академической задолженности и отчисления студентов в высших учебных заведениях. Предложена модель системы раннего предупреждения на основе машинного обучения, использующая данные об оценках, посещаемости и учебной активности, накапливаемые в информационной системе HEMIS. Освещены этапы построения модели, отбор признаков, критерии оценки алгоритмов, а также вопросы защиты персональных данных.*

Ключевые слова: *HEMIS, машинное обучение, образовательная аналитика, система раннего предупреждения, академическая задолженность, градиентный бустинг, SHAP.*

Abstract. *The article addresses the problem of early identification of students at risk of academic debt and dropout in higher education institutions. A machine learning-based early warning system model is proposed that uses grading, attendance and learning activity data accumulated in the HEMIS information system. The stages of model construction, feature selection, algorithm evaluation criteria and personal data protection issues are discussed.*

Keywords: *HEMIS, machine learning, learning analytics, early warning system, academic debt, gradient boosting, SHAP.*



KIRISH

Oliy ta'limda qamrov darajasining oshishi bilan bir qatorda ta'lim sifatini ta'minlash va talabalar kontingentini saqlab qolish masalasi tobora dolzarb bo'lib bormoqda. Har bir semestr yakunida talabalarning ma'lum qismi fanlardan akademik qarzdor bo'lib qoladi, ularning bir qismi esa keyinchalik o'qishdan chetlashtiriladi. Amaliyotda bu holat odatda semestr oxirida, ya'ni vaziyatni o'zgartirish imkoniyati deyarli qolmaganda aniqlanadi.

O'zbekiston Respublikasi oliy ta'lim tizimini 2030-yilgacha rivojlantirish konsepsiyasi [1] va "Raqamli O'zbekiston – 2030" strategiyasi [2] ta'lim jarayonini raqamlashtirishni ustuvor vazifa sifatida belgiladi. Natijada oliy ta'lim muassasalarida HEMIS axborot tizimi joriy etilib, talabalar baholari, davomati va o'quv rejalari to'g'risidagi ma'lumotlar yagona elektron bazada to'planmoqda. Biroq bu ma'lumotlardan hozircha asosan hisobga olish va hisobot tayyorlash maqsadida foydalanilmoqda, ular yordamida talabalar muvaffaqiyatini bashorat qilish imkoniyatlari esa yetarlicha o'rganilmagan.

Maqolaning maqsadi HEMIS ma'lumotlari asosida akademik xavf guruhidagi talabalarni semestr davomida erta aniqlash imkonini beruvchi mashinaviy o'qitish modelini taklif etishdan iborat.

ASOSIY QISM

Muammoning nazariy asoslari. V.Tinto modeliga ko'ra, talabaning o'qishni davom ettirishi uning akademik va ijtimoiy muhitga integratsiyalashuv darajasiga bog'liq [3]. Akademik integratsiyaning pasayishi odatda baholar va davomat ko'rsatkichlarida boshqa belgilardan oldinroq namoyon bo'ladi. Ta'lim ma'lumotlarini intellektual tahlil qilish (educational data mining) va ta'lim analitikasi yo'nalishidagi tadqiqotlar bunday belgilarni mashinaviy o'qitish yordamida aniqlash mumkinligini ko'rsatmoqda [4].

Ma'lumotlar va belgilarni tanlash. Model uchun zarur ma'lumotlarning asosiy qismi HEMIS tizimida allaqachon mavjud. Ular mazmuniga ko'ra to'rt guruhga ajratildi (1-jadval).

1-jadval. Modelda foydalaniladigan belgilar guruhlari

Belgilar guruhi	Ko'rsatkichlar	Ma'lumot manbai
Akademik natijalar	Joriy va oraliq nazorat ballari, oldingi semestr o'rtacha bali, qayta topshirishlar soni	HEMIS: baholash qaydlari



Belgilar guruhi	Ko'rsatkichlar	Ma'lumot manbai
Davomat	Sababsiz qoldirilgan soatlar ulushi, ketma-ket qoldirilgan darslar soni	HEMIS: davomat jurnali
O'quv faolligi	Topshiriqlarni o'z vaqtida yuklash, elektron resurslarga murojaatlar soni	LMS platformasi
Ta'lim sharoiti	Ta'lim shakli, kurs, ta'lim yo'nalishi, to'lov shakli	HEMIS: talaba ma'lumotlari

Maqsadli o'zgaruvchi sifatida talabaning semestr yakunida kamida bitta fandan akademik qarzdor bo'lib qolishi (1 – ha, 0 – yo'q) belgilandi. Muhim jihat shundaki, model semestrning 6–8-haftalarida mavjud bo'lgan ma'lumotlar bilan ishlashi kerak, aks holda bashorat o'z amaliy ahamiyatini yo'qotadi.

Algoritmnlarni tanlash va baholash. Bazaviy model sifatida natijalari oson talqin qilinadigan logistik regressiya, asosiy modellar sifatida esa tasodifiy o'rmon (Random Forest) [5] va gradiyentli busting (XGBoost) [6] algoritmnlarni qo'llash tavsiya etiladi. Ta'lim ma'lumotlarida xavf guruhidagi talabalar ulushi odatda kichik bo'lgani sababli sinflar nomutanosibligi yuzaga keladi. Uni bartaraf etish uchun SMOTE usuli [7] yoki sinflarga og'irlik berish usuli qo'llaniladi.

Modelni baholashda umumiy aniqlik (accuracy) ko'rsatkichi yetarli emas, chunki xavf ostidagi talabani “o'tkazib yuborish” xavfsiz talabani xavf guruhiga noto'g'ri kiritishdan ancha qimmatga tushadi. Shu sababli asosiy mezon sifatida to'liqlik (recall), qo'shimcha ravishda esa F1-o'lchov va ROC-AUC ko'rsatkichlaridan foydalanish maqsadga muvofiq.

Natijalarni izohlash. Guruh murabbiyi yoki dekanat xodimi uchun “talaba xavf guruhida” degan xulosaning o'zi kam foyda beradi, uning sababini bilish muhim. SHAP usuli [8] har bir talaba uchun bashoratga eng katta ta'sir ko'rsatgan omillarni, masalan, davomatning keskin pasayishi yoki oraliq nazoratdagi past ballni ko'rsatib beradi va aniq yordam choralarni belgilashga imkon yaratadi.

Erta ogohlantirish tizimining ishlash sxemasi. Taklif etilayotgan tizim quyidagi bosqichlarda ishlaydi:

- 1) HEMIS'dan ma'lumotlarni haftalik avtomatik eksport qilish;



- 2) ma'lumotlarni tozalash va belgilarni hisoblash;
- 3) o'qitilgan model yordamida har bir talabani xavf ehtimolini hisoblash;
- 4) talabalarni past, o'rta va yuqori xavf darajalariga ajratish;
- 5) guruh murabbiylariga ogohlantirish va tavsiya etilgan chora-tadbirlar ro'yxatini yuborish.

Axloqiy va huquqiy jihatlar. Talabalar haqidagi ma'lumotlar shaxsga doir ma'lumotlar hisoblanadi, shu bois ularni qayta ishlash "Shaxsga doir ma'lumotlar to'g'risida"gi Qonun [9] talablariga muvofiq amalga oshirilishi lozim. Modelni o'qitishda ma'lumotlar anonimlashtirilishi, natijalarga kirish esa faqat vakolatli xodimlar bilan cheklanishi kerak. Eng muhimi, model natijalari talabani jazolash uchun emas, balki unga o'z vaqtida yordam ko'rsatish uchun ishlatilishi zarur.

XULOSA

Tahlillar shuni ko'rsatadiki, HEMIS tizimida to'planayotgan ma'lumotlar hisobot vositasidan talabalar muvaffaqiyatini boshqarish vositasiga aylanishi mumkin. Buning uchun quyidagilar taklif etiladi:

- 1) HEMIS tizimida ta'lim analitikasi uchun anonimlashtirilgan ma'lumotlarni eksport qilish imkoniyatini yaratish;
- 2) taklif etilgan modelni bitta fakultet misolida tajriba-sinovdan o'tkazib, uning aniqligini real ma'lumotlarda baholash;
- 3) guruh murabbiylari uchun xavf guruhidagi talabalar bilan ishlash bo'yicha amaliy yo'riqnoma ishlab chiqish;
- 4) modelni har o'quv yilida yangi ma'lumotlar asosida qayta o'qitishni yo'lga qo'yish.

Mazkur yondashuv akademik qarzdorlik va o'qishdan chetlashtirish holatlarini kamaytirishga, pirovardida esa ta'lim sifatini oshirishga xizmat qiladi.

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SIL KASALLIGI: ETIOLOGIYASI, PATOGENEZI, ZAMONAVIY DIAGNOSTIKASI VA DAVOLASH USULLARI

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Annotatsiya

Ushbu ilmiy ish sil kasalligining zamonaviy tibbiyotdagi o'rnini, etiologiyasi, epidemiologiyasi, patogenezini, klinik belgilari, diagnostikasi, davolash va profilaktikasining zamonaviy tamoyillarini o'rganishga bag'irlangan. Sil kasalligi asosan *Mycobacterium tuberculosis* kompleksi bakteriyalari tomonidan chaqiriladigan yuqumli kasallik bo'lib, ko'pincha o'pkanini zararlaydi, biroq organizmning boshqa a'zolari, jumladan limfa tugunlari, buyrak, suyak, umurtqa pog'onasi va markaziy asab tizimida ham rivojlanishi mumkin.

Tadqiqotda sil infeksiyasining latent va faol shakllari, immun javobning kasallik rivojlanishidagi roli, granuloma hosil bo'lish mexanizmi, o'pka to'qimasidagi patologik o'zgarishlar hamda kasallikning klinik-diagnostik xususiyatlari tahlil qilindi. Zamonaviy diagnostikada molekulyar-genetik testlar, balg'am mikroskopiyasi, bakteriologik ekish, dori sezgirligini aniqlash, ko'krak qafasi rentgenografiyasi va zarur hollarda kompyuter tomografiyasidan foydalanish muhim ahamiyatga ega. WHO 2025-yilgi diagnostika yo'riqnomasida sil kasalligi va rifampitsin rezistentligini aniqlash uchun yangi diagnostik texnologiyalar sinflari hamda turli biologik namunalarni tekshirishga oid yangilangan tavsiyalarni keltirgan. Dunyo Sog'liqni Saqlash Tashkiloti+1

Davolashda bir nechta silga qarshi preparatlarni kombinatsiyalangan holda va belgilangan muddat davomida qo'llash asosiy tamoyil hisoblanadi. Dori vositalarini noto'g'ri yoki to'liq bo'lmagan tarzda qabul qilish dori-rezistent sil shakllarining rivojlanishiga olib kelishi mumkin. Shu sababli zamonaviy sil nazoratida erta diagnostika, dori sezgirligini aniqlash, individual davolash strategiyasi, bemorni muntazam kuzatish va epidemiologik profilaktika bir-biri bilan uzviy bog'liq holda amalga oshiriladi.



Kalit soʻzlar: sil kasalligi, tuberkulyoz, *Mycobacterium tuberculosis*, latent sil infeksiyasi, faol sil, oʻpka sili, granuloma, balgʻam tekshiruvi, molekulyar diagnostika, GeneXpert, dori-rezistent sil, MDR-TB, rifampitsin rezistentligi, antituberkulyoz terapiya, BCG vaktsinatsiyasi, profilaktika, immun javob, epidemiologiya.

Аннотация

Данная научная работа посвящена изучению туберкулёза, его этиологии, патогенеза, клинических проявлений, современных методов диагностики, лечения и профилактики. Туберкулёз является инфекционным заболеванием, вызываемым преимущественно бактериями комплекса *Mycobacterium tuberculosis*. Наиболее часто поражаются лёгкие, однако заболевание может развиваться и в других органах, включая лимфатические узлы, почки, кости, позвоночник и центральную нервную систему.

В работе рассмотрены латентная туберкулёзная инфекция и активный туберкулёз, механизмы иммунного ответа, формирование гранулёмы и развитие патологических изменений в лёгочной ткани. Современная диагностика включает молекулярно-генетические методы, микроскопическое исследование мокроты, культуральное исследование, определение лекарственной чувствительности, рентгенографию органов грудной клетки и, при необходимости, компьютерную томографию. Обновлённые рекомендации ВОЗ 2025 года включают современные подходы к выявлению туберкулёза и лекарственной устойчивости. Dunyo

Современное лечение туберкулёза основывается на применении комбинаций противотуберкулёзных препаратов в соответствии с установленной схемой и продолжительностью терапии. Нарушение режима лечения может способствовать формированию лекарственной устойчивости. Поэтому раннее выявление заболевания, определение лекарственной чувствительности, рациональная терапия, наблюдение за пациентом и профилактические мероприятия являются основными компонентами современной борьбы с туберкулёзом. D Dunyo Sog'liqni

Ключевые слова: туберкулёз, *Mycobacterium tuberculosis*, латентная туберкулёзная инфекция, активный туберкулёз, лёгочный туберкулёз,



гранулёма, диагностика, молекулярно-генетические методы, лекарственная устойчивость, MDR-TB, противотуберкулёзная терапия, вакцинация БЦЖ, профилактика, иммунный ответ, эпидемиология.

Abstract

This scientific work focuses on tuberculosis, its etiology, pathogenesis, clinical manifestations, modern diagnostic methods, treatment and prevention. Tuberculosis is an infectious disease mainly caused by bacteria of the *Mycobacterium tuberculosis* complex. The lungs are the most commonly affected organs; however, tuberculosis can also involve lymph nodes, kidneys, bones, the spine and the central nervous system.

The study analyzes latent tuberculosis infection and active tuberculosis, mechanisms of host immune response, granuloma formation, and pathological changes in lung tissue. Modern diagnosis includes molecular tests, sputum microscopy, culture, drug-susceptibility testing, chest radiography and, when clinically indicated, computed tomography. The updated WHO 2025 diagnostic guidance incorporates new approaches for detecting tuberculosis and drug resistance.

Modern tuberculosis treatment is based on combination therapy with several anti-tuberculosis drugs administered according to an established regimen and duration. Inadequate or incomplete treatment may contribute to the development of drug-resistant tuberculosis. Therefore, early diagnosis, drug-susceptibility testing, appropriate therapy, patient monitoring and preventive interventions represent the major components of modern tuberculosis control.

Keywords: tuberculosis, *Mycobacterium tuberculosis*, latent tuberculosis infection, active tuberculosis, pulmonary tuberculosis, granuloma, molecular diagnosis, drug resistance, MDR-TB, anti-tuberculosis therapy, BCG vaccination, prevention, immune response, epidemiology.

Kirish

Sil kasalligi insoniyat tarixidagi eng muhim yuqumli kasalliklardan biri bo‘lib, hozirgi kunda ham jamoat salomatligi uchun dolzarb muammo bo‘lib qolmoqda. Kasallikning qo‘zg‘atuvchisi asosan *Mycobacterium tuberculosis* bo‘lib,



u kislotaga chidamli tayoqchasimon bakteriya hisoblanadi. Sil ko‘pincha nafas yo‘llari orqali yuqadi va birlamchi zararlanish joyi sifatida o‘pka to‘qimasi alohida ahamiyatga ega. Shu bilan birga, mikobakteriyalar limfa va qon oqimi orqali boshqa organlarga tarqalib, ekstrapulmonal sil shakllarini yuzaga keltirishi mumkin.

Sil infeksiyasining muhim xususiyatlaridan biri — organizmga tushgan mikobakteriyalar har doim ham darhol faol kasallikni yuzaga keltirmasligidir. Ayrim bemorlarda infeksiya latent holatda saqlanadi. Bunday holatda bakteriyalar organizmda mavjud bo‘lsa-da, faol ko‘payish va klinik kasallik belgilarini yuzaga keltirmaydi. Immun tizimi zaiflashganda esa latent infeksiya faol sil kasalligiga aylanishi mumkin.

Silning patogenezida makrofaglar, T-limfotsitlar, sitokinlar va granuloma hosil bo‘lish jarayonlari muhim o‘rin tutadi. Organizm immun tizimi mikobakteriyalarni chegaralash uchun ularni immun hujayralari bilan o‘rab, granuloma hosil qiladi. Ushbu jarayon infeksiyaning uzoq vaqt nazorat ostida saqlanishiga yordam beradi, biroq immunitetning susayishi mikobakteriyalarning qayta faollashishiga sharoit yaratishi mumkin.

Mavzuning dolzarbligi, avvalo, sil kasalligining yuqori epidemiologik ahamiyati, uzoq muddat davolanishni talab qilishi va dori-rezistent shakllarning mavjudligi bilan belgilanadi. Zamonaviy tibbiyotda silni erta aniqlash, dori sezgirligini tezkor aniqlash va samarali davolash sxemasini tanlash kasallikni nazorat qilishning muhim yo‘nalishlaridan hisoblanadi.

2025-yilda WHO sil diagnostikasi bo‘yicha yangilangan konsolidatsiyalangan tavsiyalarni e‘lon qilib, sil infeksiyasi, faol kasallik va dori rezistentligini aniqlashga qaratilgan zamonaviy texnologiyalarni tizimlashtirdi. Dunyo Sog‘liqni Saqlash Tashkiloti

1-rasm. Sil kasalligi qo‘zg‘atuvchisi — *Mycobacterium tuberculosis*.

Rasm uchun tavsiya: mikobakteriyaning mikroskopik ko‘rinishi, kislotaga chidamli tayoqchasimon bakteriyalar tasviri.

Mavzuning dolzarbligi



Sil kasalligi nafaqat individual bemor salomatligiga, balki jamiyatdagi epidemiologik vaziyatga ham ta'sir ko'rsatadigan kasallikdir. Faol o'pka sili bo'lgan bemorlar, ayniqsa davolash boshlanmagan yoki samarasiz olib borilayotgan holatlarda, bakteriyalarni atrof-muhitga chiqarishi mumkin. Shu sababli kasallikni erta aniqlash va davolash nafaqat bemorning sog'ayishi, balki infeksiyaning boshqa shaxslarga tarqalishini kamaytirish uchun ham muhimdir.

Sil kasalligining yana bir muhim jihati — dori vositalariga rezistentlik muammosidir. Bir nechta antituberkulyoz preparatlariga chidamli mikobakteriyalarni davolash oddiy dori sezgir silga qaraganda murakkabroq bo'lishi mumkin. Shu sababli zamonaviy diagnostikaning muhim vazifalaridan biri faqat mikobakteriyani aniqlash emas, balki imkon qadar erta bosqichda uning dori vositalariga sezgirlik profilini baholashdan iborat.

Tadqiqot maqsadi

Ushbu tadqiqotning asosiy maqsadi — sil kasalligining etiologiyasi, patogenezini, klinik kechishi, diagnostikasi, zamonaviy davolash tamoyillari va profilaktikasini ilmiy manbalar asosida tahlil qilish.

Tadqiqotning asosiy vazifalari quyidagilardan iborat:

- sil kasalligi etiologiyasini va qo'zg'atuvchisining biologik xususiyatlarini o'rganish;
- sil infeksiyasining yuqish va rivojlanish mexanizmlarini tahlil qilish;
- latent va faol sil infeksiyasi o'rtasidagi farqlarni aniqlash;
- kasallikning asosiy klinik belgilarini tavsiflash;
- zamonaviy laborator va instrumental diagnostika usullarini o'rganish;
- dori sezgir va dori-rezistent silni davolash tamoyillarini tahlil qilish;
- sil kasalligini oldini olishning zamonaviy usullarini yoritish.

Metodologiya

Tadqiqot nazariy-tahliliy xarakterga ega bo'lib, sil kasalligi bo'yicha zamonaviy ilmiy adabiyotlar, xalqaro klinik tavsiyalar va tibbiyot tashkilotlarining rasmiy materiallari tahlil qilindi.



Tadqiqotda quyidagi metodlardan foydalanildi:

Adabiyotlar tahlili. Sil kasalligining etiologiyasi, patogenezini, diagnostikasi va davolashiga oid zamonaviy ilmiy manbalar o'rganildi.

Qiyosiy tahlil. Latent va faol sil, dori sezgir va dori-rezistent sil shakllari o'rtasidagi klinik va diagnostik farqlar umumlashtirildi.

Tizimli yondashuv. Kasallikning etiologiyasi, immunologik mexanizmlari, klinik ko'rinishlari, laborator diagnostikasi, davolash va profilaktikasi yagona patologik jarayon sifatida ko'rib chiqildi.

Klinik-tahliliy yondashuv. Zamonaviy tibbiyotda qo'llaniladigan diagnostik va terapevtik yondashuvlarning klinik ahamiyati baholandi.

WHOning 2025-yilgi diagnostika bo'yicha tavsiyalarida sil va dori rezistentligini aniqlashga qaratilgan zamonaviy diagnostik texnologiyalar hamda turli biologik namunalarni tekshirish bo'yicha yangilangan yondashuvlar keltirilgan. **D**Dunyo Sog'liqni Saqlash Tashkiloti+1

Asosiy qism

Sil kasalligining etiologiyasi

Sil kasalligining asosiy qo'zg'atuvchisi *Mycobacterium tuberculosis* hisoblanadi. Ushbu mikroorganizm kislotaga chidamli bo'lib, hujayra devorining lipid va mikolik kislotalarga boyligi uning o'ziga xos biologik xususiyatlarini belgilaydi.

Mikobakteriyalar tashqi muhitda ma'lum vaqt saqlanishi mumkin, biroq kasallikning asosiy yuqish yo'li havo orqali hisoblanadi. Faol o'pka yoki hiqildoq sili bo'lgan odam yo'talish, aksirish, gapirish yoki boshqa nafas chiqarish jarayonlarida havoga mikobakteriyalarni o'z ichiga olgan zarrachalarni chiqarishi mumkin.

Infeksiya rivojlanishi organizmning immun holati, mikobakteriyalar bilan kontakt darajasi va boshqa xavf omillariga bog'liq.

Sil kasalligining patogenezini



Sil patogenezini shartli ravishda bir necha bosqichga ajratish mumkin.

Birinchi bosqichda mikobakteriyalar nafas yo'llari orqali o'pkaga tushadi va alveolalarga yetib boradi. Ularni alveolyar makrofaglar fagotsitoz qiladi. Biroq *M. tuberculosis* makrofaglar ichida yashab qolish va ko'payish imkoniyatiga ega.

Keyingi bosqichda organizmning hujayraviy immun javobi faollashadi. T-limfotsitlar va boshqa immun hujayralar infeksiyalangan o'choq atrofiga to'planadi. Natijada granuloma hosil bo'ladi. Granuloma mikobakteriyalarni chegaralash va ularning tarqalishini nazorat qilishda muhim biologik mexanizm hisoblanadi.

Agar immun javob yetarli bo'lsa, infeksiya latent holatda qolishi mumkin. Immunitet pasaygan hollarda esa mikobakteriyalar faollashib, faol sil kasalligini yuzaga keltirishi mumkin.

2-rasm. Sil kasalligida granuloma hosil bo'lishining sxematik tasviri.

Rasm uchun tavsiya: markazda nekrotik o'choq, uning atrofida epiteloid hujayralar, Langhans gigant hujayralari va limfotsitlardan tashkil topgan granuloma sxemasi.

Latent va faol sil

Latent sil infeksiyasida odam organizmida mikobakteriyalar mavjud bo'ladi, biroq klinik kasallik belgilarisiz kechadi va bunday shaxslar odatda infeksiyani boshqalarga yuqtirmaydi. Faol sil kasalligida esa mikobakteriyalar ko'payadi, klinik belgilar paydo bo'ladi va o'pka sili mavjud bo'lsa, bemor boshqalarga infeksiya tarqatishi mumkin.

Latent infeksiya faol kasallikka aylanishi mumkinligi sababli xavf guruhlaridagi shaxslarni aniqlash va tegishli profilaktik davolashni amalga oshirish sil nazoratining muhim yo'nalishidir.

CDC ma'lumotlariga ko'ra, davolanmagan latent infeksiyaga ega shaxslarning taxminan 5–10 foizida hayot davomida faol sil kasalligi rivojlanishi mumkin; xavf immunitetni susaytiruvchi holatlarda yuqoriroq bo'ladi. [C]CDC+1

Klinik belgilari



O'pka silining klinik ko'rinishi kasallikning shakli, davomiyligi, zararlanish darajasi va bemorning immun holatiga bog'liq.

Asosiy klinik belgilar quyidagilardan iborat:

- uzoq davom etuvchi yo'tal;
- balg'am ajralishi;
- ba'zi hollarda qon tupurish;
- tana haroratining ko'tarilishi;
- tungi terlash;
- ishtahaning pasayishi;
- tana vaznining kamayishi;
- umumiy holsizlik;
- tez charchash;
- ko'krak qafasidagi og'riq.

Sil kasalligi ko'pincha asta-sekin rivojlanadi va belgilar bir necha hafta yoki oy davomida saqlanishi mumkin.

Ekstrapulmonal silning klinik belgilari zararlangan organga bog'liq. Masalan, umurtqa sili bel og'rig'i bilan, buyrak sili siydikda qon paydo bo'lishi bilan, sil meningiti esa bosh og'rig'i, ong o'zgarishi va boshqa nevrologik belgilar bilan namoyon bo'lishi mumkin.

Sil kasalligini zamonaviy diagnostika qilish

Sil diagnostikasi kompleks yondashuvni talab qiladi. Faqat klinik belgilar asosida tashxis qo'yish yetarli emas. Laborator, mikrobiologik, molekulyar va instrumental tekshiruvlar o'zaro birlashtiriladi.

1. Anamnez va klinik tekshiruv

Bemorning shikoyatlari, kasallikning davomiyligi, sil bilan kasallangan shaxs bilan aloqasi, avvalgi sil kasalligi, ilgari o'tkazilgan davolash, immunitet holati va boshqa xavf omillari aniqlanadi.

Fizik tekshiruv tashxis uchun yakuniy usul bo'lmasa-da, bemorning umumiy holatini baholash va keyingi diagnostik strategiyani tanlashda muhimdir.  CDC



2. Tuberkulin testi va IGRA

Tuberkulin teri testi (TST/Mantoux) hamda interferon-gamma ajralishini aniqlovchi testlar (IGRA) organizmning sil infeksiyasiga immunologik javobini baholashga yordam beradi.

Biroq ushbu testlar faol sil kasalligini mustaqil ravishda tasdiqlamaydi. Ijobiy natija olinganda faol kasallikni istisno qilish uchun qo'shimcha klinik, rentgenologik va mikrobiologik tekshiruvlar talab qilinadi.

3. Balg'amning mikrobiologik tekshiruvi

O'pka sili diagnostikasida balg'am muhim biologik material hisoblanadi.

Unda quyidagi tekshiruvlar amalga oshirilishi mumkin:

- mikroskopik tekshiruv;
- molekulyar-genetik test;
- bakteriologik ekish;
- dori sezgirligini aniqlash.

Kultura usuli mikrobiologik diagnostikada muhim referens usullardan biri bo'lib, mikobakteriyani o'stirish va keyinchalik dori sezgirligini aniqlash imkonini beradi.

4. Molekulyar-genetik diagnostika

Zamonaviy molekulyar testlar sil mikobakteriyasining DNKsini aniqlash va ayrim hollarda dori rezistentligi, xususan rifampitsin rezistentligi haqida tezkor ma'lumot olish imkonini beradi.

WHO 2025-yilgi diagnostika yo'riqnomasida sil va rifampitsin rezistentligini dastlabki aniqlash uchun yangi diagnostik texnologiyalar sinflari va ularni amaliyotga joriy etish bo'yicha tavsiyalar keltirilgan. Dunyo Sog'liqni Saqlash Tashkiloti

3-rasm. Sil kasalligini diagnostika qilish algoritmi.

Rasm uchun tavsiya: klinik shubha → balg'am namunasi → molekulyar test → mikroskopiya/kultura → dori sezgirligini aniqlash → davolash sxemasini tanlash.



5. Rentgenologik tekshiruv

Ko'krak qafasi rentgenografiyasi o'pka to'qimasidagi patologik o'zgarishlarni aniqlashda muhim instrumental usullardan biridir.

Rentgenologik tekshiruvda infiltrativ o'zgarishlar, kavernalar, o'choqli jarayonlar, fibroz o'zgarishlar va boshqa patologik belgilar aniqlanishi mumkin.

Biroq rentgenologik tasvirning o'zi sil tashxisini mikrobiologik jihatdan tasdiqlamaydi. Shuning uchun radiologik natijalar klinik va laborator tekshiruvlar bilan birgalikda baholanishi kerak.

4-rasm. O'pka silining rentgenologik ko'rinishi.

Rasm uchun tavsiya: o'pka yuqori bo'laklarida infiltrativ/kavernoz o'zgarishlar ko'rsatilgan ko'krak qafasi rentgenogrammasi.

6. Kompyuter tomografiyasi

Kompyuter tomografiyasi rentgenografiyaga nisbatan o'pka parenximasidagi o'zgarishlarni batafsilroq ko'rsatishi mumkin. Ayniqsa, murakkab klinik holatlarda, ekstrapulmonal jarayonlarda yoki boshqa kasalliklar bilan differensial diagnostika zarur bo'lgan hollarda qo'shimcha ahamiyatga ega.

Sil kasalligini davolash

Sil kasalligini davolash uzoq muddatli va kompleks jarayon bo'lib, dori vositalarini belgilangan sxema asosida muntazam qabul qilishni talab qiladi.

Davolashning asosiy maqsadlari:

- mikobakteriyalarni yo'q qilish;
- bemorni klinik jihatdan sog'aytirish;
- kasallikning qaytalanish xavfini kamaytirish;
- mikobakteriyalarning boshqa shaxslarga yuqishini kamaytirish;
- dori rezistentligi rivojlanishining oldini olish.

Silga qarshi terapiyada bir nechta preparatlarni birgalikda qo'llash muhim. Buning asosiy sababi mikobakteriyalar populyatsiyasining biologik jihatdan xilma-xilligi va



bitta preparat bilan davolash dori rezistentligi shakllanishiga olib kelishi mumkinligidir. [C]CDC

WHO 2025-yilgi davolash va parvarish bo'yicha konsolidatsiyalangan yo'riqnomasida dori sezgir va dori-rezistent silni boshqarish, bemorni kuzatish va qo'llab-quvvatlashga oid zamonaviy tavsiyalar jamlangan. Dunyo Sog'liqni Saqlash Tashkiloti

Davolash rejimi kasallikning shakli, mikobakteriyaning dori sezgirliigi, bemorning yoshi, hamroh kasalliklari, boshqa dori vositalari bilan o'zaro ta'siri va boshqa klinik omillarga qarab belgilanadi.

Muhim: silga qarshi preparatlarning aniq kombinatsiyasi va dozasi shifokor tomonidan belgilanadi. Bemor dorilarni o'zicha boshlashi, to'xtatishi yoki dozani o'zgartirishi mumkin emas.

Dori-rezistent sil

Dori-rezistent sil zamonaviy ftiziatriyaning eng murakkab muammolaridan biridir. Mikobakteriyalarning ayrim silga qarshi preparatlarga chidamli bo'lishi davolashni murakkablashtiradi.

Ayniqsa rifampitsin va izoniazid kabi asosiy preparatlarga chidamlilik klinik jihatdan katta ahamiyatga ega. Dori-rezistent silni aniqlash uchun molekulyar-genetik testlar, fenotipik dori sezgirlik testlari va boshqa zamonaviy laborator usullardan foydalaniladi.

WHOning zamonaviy diagnostik tavsiyalari dori rezistentligini imkon qadar erta aniqlashni silga qarshi terapiyani to'g'ri tanlashning muhim elementi sifatida ko'rib chiqadi. Dunyo Sog'liqni Saqlash Tashkiloti+1

Dori-rezistent sil holatlarida davolash sxemasi mutaxassis tomonidan mikrobiologik natijalar asosida belgilanadi. Davolash davomida bemorning klinik va laborator holati muntazam kuzatib boriladi.

Latent sil infeksiyasini davolash



Latent sil infeksiyasini davolashning asosiy maqsadi faol sil kasalligiga o'tishning oldini olishdir. Biroq latent infeksiyani davolashdan oldin faol sil kasalligini istisno qilish muhim.

CDC ma'lumotlariga ko'ra, latent infeksiyada qisqa muddatli rifamitsin asosidagi davolash sxemalari ko'plab holatlarda afzal ko'riladi. Ular orasida 3 oylik izoniazid va rifapentin, 4 oylik rifampin yoki 3 oylik izoniazid va rifampin asosidagi rejimlar mavjud.

Davolash sxemasini tanlashda bemorning yoshi, boshqa kasalliklari, dori-darmonlar bilan o'zaro ta'siri va infeksiya manbasining dori sezgirligi kabi omillar hisobga olinadi.

Sil kasalligida asoratlar

Davolanmagan yoki yetarli darajada davolanmagan sil turli asoratlarga olib kelishi mumkin.

O'pka silida:

- o'pka to'qimasining destruksiyasi;
- kavernalar;
- o'pka fibrozlanishi;
- qon tupurish;
- nafas yetishmovchiligi;
- ikkilamchi infeksiyalar

kuzatilishi mumkin.

Mikobakteriyalar boshqa organlarga tarqalgan hollarda meningit, suyak-bo'g'im sili, buyrak sili va boshqa ekstrapulmonal shakllar yuzaga kelishi mumkin.

Sil kasalligining profilaktikasi

Silga qarshi kurashda profilaktika katta ahamiyatga ega.

Profilaktikaning asosiy yo'nalishlari:

- faol sil kasalligini erta aniqlash;
- bemorlarni o'z vaqtida davolash;



- sil bilan kontaktda bo'lgan shaxslarni tekshirish;
- latent sil infeksiyasini aniqlash va zarur hollarda davolash;
- tibbiyot muassasalarida infeksiya nazorati;
- respirator himoya choralaridan foydalanish;
- bolalarda BCG vaktsinatsiyasini milliy emlash taqvimiga muvofiq amalga oshirish.

Latent sil infeksiyasini davolash faol sil kasalligiga o'tish xavfini kamaytirishning muhim strategiyalaridan biridir. CDC

5-rasm. Sil kasalligini profilaktika qilish sxemasi.

Rasm uchun tavsiya: BCG vaktsinatsiyasi → xavf guruhlarini aniqlash → skrining → latent infeksiyani davolash → faol silni erta aniqlash → to'liq davolash → epidemiologik nazorat.

Asosiy natijalar

Tadqiqot davomida sil kasalligining zamonaviy tibbiyotdagi o'rniga oid quyidagi asosiy xulosalar olindi.

Birinchidan, sil kasalligi faqat o'pka patologiyasi emas, balki butun organizmga ta'sir ko'rsatishi mumkin bo'lgan infeksiyon jarayon hisoblanadi. Mikobakteriyalar turli organlarga tarqalishi mumkinligi sababli klinik diagnostikada ekstrapulmonal shakllar ham hisobga olinishi zarur. CDC

Ikkinchidan, sil infeksiyasining latent va faol shakllarini farqlash katta klinik ahamiyatga ega. Latent infeksiyaga ega shaxs odatda kasallik belgilarisiz bo'ladi va infeksiyani tarqatmaydi, faol sil esa klinik simptomlar va yuqish xavfi bilan kechishi mumkin.

Uchinchidan, zamonaviy diagnostikada molekulyar-genetik usullarning ahamiyati oshib bormoqda. Bunday texnologiyalar mikobakteriyani tez aniqlash va ayrim dori rezistentligi shakllarini qisqa vaqt ichida aniqlash imkonini beradi. WHO 2025-yilgi tavsiyalarida yangi diagnostik texnologiyalar va ularning amaliy qo'llanilishiga oid yondashuvlar yangilangan. Dunyo Sog'liqni Saqlash Tashkiloti



To'rtinchidan, sil kasalligini davolashda kombinatsiyalangan terapiya, dori sezgirligini hisobga olish va davolash kursini to'liq yakunlash muhimdir. Dori vositalarini noto'g'ri qo'llash rezistentlik rivojlanishiga sabab bo'lishi mumkin.

Beshinchidan, sil kasalligini nazorat qilish faqat bemorni davolash bilan cheklanmaydi. Faol holatlarni erta aniqlash, kontaktlarni tekshirish, latent infeksiyani davolash, infeksiya nazorati va profilaktik tadbirlar birgalikda olib borilishi kerak.

Muhokama

Sil kasalligiga qarshi kurashning zamonaviy modeli etiologik davolash, laborator diagnostika va epidemiologik nazoratning integratsiyasiga asoslanadi. Avvalgi davrlarda sil diagnostikasida klinik simptomlar va rentgenologik tekshiruvlarga katta urg'u berilgan bo'lsa, hozirgi tibbiyotda mikrobiologik va molekulyar-genetik diagnostika imkoniyatlari sezilarli darajada kengaygan.

Ayniqsa, dori rezistentligini tez aniqlashning klinik ahamiyati katta. Chunki bemorga mos kelmaydigan davolash sxemasi kasallikning davom etishiga va rezistent mikobakteriyalarning saqlanib qolishiga olib kelishi mumkin.

Shuningdek, bemorning davolanishga rioya qilishi ham muhim omildir. Sil kasalligi uzoq muddatli terapiyani talab qilishi sababli bemor bilan muntazam aloqa, dori qabulini nazorat qilish, nojo'ya ta'sirlarni o'z vaqtida aniqlash va psixologik-ijtimoiy qo'llab-quvvatlash davolash samaradorligiga ta'sir qiladi.

Zamonaviy WHO tavsiyalarida sil kasalligini davolash va bemorga yordam ko'rsatish masalalari yagona kompleks yondashuv doirasida ko'rib chiqilgan.

 Dunyo Sog'liqni Saqlash Tashkiloti

Xulosa

O'tkazilgan ilmiy-tahliliy tadqiqot natijalari sil kasalligi zamonaviy tibbiyot va jamoat salomatligi uchun muhim muammolardan biri ekanligini ko'rsatdi. Kasallikning qo'zg'atuvchisi *Mycobacterium tuberculosis* bo'lib, infeksiya asosan havo orqali yuqadi va ko'pincha o'pkani zararlaydi.



Sil patogenezining asosida mikobakteriyalarning makrofaglar bilan o‘zaro ta’siri, hujayraviy immun javob va granuloma shakllanishi yotadi. Immun tizimi mikobakteriyalarni nazorat ostida ushlab turgan holatda latent infeksiya shakllanishi mumkin. Immunitet susaygan hollarda esa faol sil kasalligi rivojlanishi ehtimoli ortadi.

Zamonaviy diagnostika klinik tekshiruv, rentgenologik usullar, balg‘am mikroskopiyasi, bakteriologik ekish, molekulyar-genetik testlar va dori sezgirligini aniqlash usullarining kombinatsiyasiga asoslanadi. WHOning 2025-yilgi diagnostik tavsiyalari silni va dori rezistentligini tezroq aniqlashga qaratilgan zamonaviy texnologiyalarni o‘z ichiga oladi. Dunyo Sog‘liqni Saqlash Tashkiloti

Silni davolashda bir nechta antituberkulyoz preparatlarini belgilangan sxema asosida qo‘llash, davolashni to‘liq yakunlash va bemorni muntazam kuzatish asosiy tamoyillar hisoblanadi. Dori-rezistent sil shakllarida esa mikrobiologik va molekulyar diagnostika natijalariga asoslangan individual davolash strategiyasi talab etiladi.

Kelgusida sil kasalligiga qarshi kurashda quyidagi yo‘nalishlarni rivojlantirish maqsadga muvofiq:

- molekulyar-genetik diagnostikani keng joriy etish;
- dori rezistentligini imkon qadar erta aniqlash;
- xavf guruhlarini faol skrining qilish;
- latent sil infeksiyasini aniqlash va tegishli profilaktik davolashni rivojlantirish;
- bemorlarning davolanishga rioya qilishini yaxshilash;
- silga qarshi dori vositalarining yangi kombinatsiyalarini o‘rganish;
- epidemiologik nazorat va infeksiya nazorati tizimlarini kuchaytirish;
- aholining sil kasalligi bo‘yicha tibbiy savodxonligini oshirish.

Shunday qilib, sil kasalligini samarali nazorat qilish uchun erta diagnostika, zamonaviy laborator texnologiyalar, dori sezgirligiga asoslangan davolash, profilaktika va bemorni kompleks qo‘llab-quvvatlash yagona tizim sifatida olib borilishi kerak.



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O'ZBEKISTONNING XALQARO REYTING VA INDEKSLARDAGI O'RNINI YAHSHILASH STRATEGIYASI

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Annotatsiya

Ushbu maqolada O'zbekiston Respublikasining xalqaro reyting va indekslardagi o'rnini yaxshilash strategik yo'nalishlari kompleks tahlil qilingan. Tadqiqot jarayonida innovatsion rivojlanish, iqtisodiy erkinlik, statistik samaradorlik, sanoat raqobatbardoshligi, barqaror rivojlanish hamda institutsional sifat kabi asosiy ko'rsatkichlar o'zaro bog'liqlikda o'rganildi. Natijalar mamlakat ayrim yo'nalishlarda sezilarli ijobiy siljishlarga erishayotganini, xususan innovatsion faoliyat va statistik tizim shaffofligi bo'yicha o'sish mavjudligini ko'rsatadi. Shu bilan birga, korrupsiyaga qarshi kurash, demokratiya sifati hamda barqaror rivojlanish sohalarida muammolar saqlanib qolayotgani aniqlangan. Umumiy tahlil 6 ta indeks yaxshilangan, 7 tasi yomonlashgan va 2 tasi barqaror qolganini ko'rsatib, rivojlanishning notekis xarakterga ega ekanini tasdiqlaydi. Maqolada ushbu holatni yaxshilash uchun institutsional islohotlarni chuqurlashtirish, iqtisodiy boshqaruvni takomillashtirish hamda ijtimoiy-iqtisodiy muvozanatni kuchaytirish zarurligi asoslab beriladi. Tadqiqot natijalari mamlakatning global raqobatbardoshligini oshirishga xizmat qiladi.

Kalit so'zlar: xalqaro reytinglar, xalqaro indekslar, iqtisodiy erkinlik, innovatsion rivojlanish, institutsional sifat, korrupsiyaga qarshi kurash, barqaror rivojlanish, sanoat raqobatbardoshligi, inson taraqqiyoti, statistik samaradorlik, global raqobatbardoshlik, O'zbekiston iqtisodiy islohotlari

Аннотация

В данной статье комплексно анализируются стратегические направления повышения позиций Республики Узбекистан в международных рейтингах и индексах. В ходе исследования рассмотрены взаимосвязанные



показатели, такие как инновационное развитие, экономическая свобода, статистическая эффективность, промышленная конкурентоспособность, устойчивое развитие и институциональное качество. Результаты показывают, что в ряде направлений наблюдаются значительные положительные изменения, в частности рост в сфере инновационной деятельности и прозрачности статистической системы. Вместе с тем выявлено сохранение проблем в области борьбы с коррупцией, качества демократии и устойчивого развития. Общий анализ свидетельствует, что 6 индексов улучшились, 7 ухудшились и 2 остались без изменений, что подтверждает неравномерный характер развития. В статье обосновывается необходимость углубления институциональных реформ, совершенствования экономического управления и укрепления социально-экономического баланса. Результаты исследования направлены на повышение глобальной конкурентоспособности страны.

Ключевые слова: международные рейтинги, международные индексы, экономическая свобода, инновационное развитие, институциональное качество, борьба с коррупцией, устойчивое развитие, промышленная конкурентоспособность, человеческое развитие, статистическая эффективность, глобальная конкурентоспособность, экономические реформы Узбекистана.

Abstract

This article provides a comprehensive analysis of strategic directions for improving the position of the Republic of Uzbekistan in international rankings and indices. The study examines interconnected indicators such as innovation development, economic freedom, statistical efficiency, industrial competitiveness, sustainable development, and institutional quality. The results show significant positive progress in several areas, particularly in innovation activity and statistical system transparency. At the same time, persistent challenges remain in combating corruption, the quality of democracy, and sustainable development. The overall analysis indicates that 6 indices have improved, 7 have deteriorated, and 2 have remained stable, confirming an uneven pattern of development. The article substantiates the need to deepen institutional reforms, improve economic



governance, and strengthen socio-economic balance. The findings are aimed at enhancing the country's global competitiveness.

Keywords: international rankings, global indices, economic freedom, innovation development, institutional quality, anti-corruption, sustainable development, industrial competitiveness, human development, statistical efficiency, global competitiveness, economic reforms of Uzbekistan.

Kirish

Bugungi globallashuv jarayonida mamlakatlarning xalqaro maydondagi mavqei faqat iqtisodiy o'sish ko'rsatkichlari bilan emas, balki institutsional sifat, innovatsion salohiyat, boshqaruv samaradorligi va ijtimoiy barqarorlik kabi kompleks indikatorlar orqali ham baholanmoqda. Shu nuqtayi nazardan xalqaro reyting va indekslar davlatlarning rivojlanish darajasini solishtirish, mavjud muammolarni aniqlash hamda strategik yo'nalishlarni belgilashda muhim analitik vosita sifatida xizmat qiladi.

O'zbekiston so'nggi yillarda keng ko'lamli islohotlar bosqichiga kirib, iqtisodiyotning turli sohalarida tarkibiy o'zgarishlarni amalga oshirmoqda. Ushbu jarayonlar mamlakatning xalqaro reytinglardagi o'rniga bevosita ta'sir ko'rsatib, ayrim yo'nalishlarda ijobiy siljishlarni ta'minlagan bo'lsa, boshqa sohalarda tizimli muammolarni ham yuzaga chiqarmoqda. Xususan, innovatsion rivojlanish va statistik tizimning ochiqligi bo'yicha sezilarli o'sish qayd etilayotgan bo'lsa-da, institutsional islohotlar, korrupsiyaga qarshi kurash va barqaror rivojlanish ko'rsatkichlarida yetarli natijalarga erishilmagan.

Shu bilan birga, xalqaro reytinglar dinamikasi iqtisodiy siyosatning samaradorligini baholashda muhim indikator bo'lib xizmat qiladi. Chunki ushbu ko'rsatkichlar nafaqat mavjud holatni aks ettiradi, balki kelajakdagi rivojlanish yo'nalishlarini ham belgilashga yordam beradi. Ayniqsa, O'zbekiston uchun global raqobat kuchayib borayotgan sharoitda xalqaro indekslardagi o'rinni yaxshilash iqtisodiy barqarorlikni mustahkamlash va investitsiyaviy jozibadorlikni oshirishning muhim omillaridan biri hisoblanadi.

Adabiyotlar tahlili



Xalqaro reyting va indekslar orqali mamlakatlarning rivojlanish darajasini baholash masalasi iqtisodiy va siyosiy fanlarda keng o'rganilgan yo'nalishlardan biridir. Bu borada dastlabki nazariy asoslar A. Sen tomonidan ishlab chiqilgan inson taraqqiyoti konsepsiyasida o'z ifodasini topadi¹. Uning yondashuvida rivojlanish faqat iqtisodiy o'sish bilan emas, balki insonning imkoniyatlari kengayishi va ijtimoiy farovonlik darajasi bilan belgilanadi. Mazkur qarash keyinchalik BMT Taraqqiyot Dasturi tomonidan ishlab chiqilgan Inson taraqqiyoti indeksi metodologiyasiga asos bo'lib xizmat qilgan.

Institutsional iqtisodiyot yo'nalishida D. Nort tomonidan ilgari surilgan g'oyalar ham xalqaro reytinglarni tahlil qilishda muhim nazariy asoslardan biri hisoblanadi². Uning fikricha, iqtisodiy rivojlanishning asosiy omili sifatida rasmiy va norasmiy institutlarning sifati namoyon bo'ladi. Shu nuqtayi nazardan, korrupsiya darajasi, huquq ustuvorligi va davlat boshqaruvi samaradorligi kabi ko'rsatkichlar mamlakatning xalqaro reytinglardagi o'rnini belgilovchi asosiy omillardan biri sifatida qoraladi.

R. Solou tomonidan ishlab chiqilgan iqtisodiy o'sish modeli esa kapital, mehnat va texnologik taraqqiyot o'rtasidagi bog'liqlikni tushuntiradi³. Ushbu modelga ko'ra, uzoq muddatli iqtisodiy o'sish asosan texnologik taraqqiyotga tayanadi. Bu yondashuv Global innovatsiyalar indeksi kabi ko'rsatkichlarning ahamiyatini nazariy jihatdan asoslaydi, chunki innovatsion salohiyat mamlakatning raqobatbardoshligini belgilovchi asosiy omillardan biri hisoblanadi.

J. Stiglitz, J. Sen va J.-P. Fitoussi tomonidan ishlab chiqilgan komissiya hisobotida esa iqtisodiy rivojlanishni baholashda YaIMdan tashqari kengroq indikatorlar tizimidan foydalanish zarurligi ta'kidlangan⁴. Ularning fikricha, ijtimoiy tenglik, ekologik barqarorlik va hayot sifati kabi omillar ham rivojlanish darajasini to'liq aks ettiradi. Bu yondashuv Barqaror rivojlanish maqsadlari indeksining nazariy asoslarini shakllantirishda muhim rol o'ynagan.

Xalqaro tashkilotlar, xususan Jahon banki, Jahon iqtisodiy forumi va Transparency International tomonidan ishlab chiqilgan metodologiyalar ham

¹ Amartya Sen, *Development as Freedom*, 1999

² Douglass C. North, *Institutions, Institutional Change and Economic Performance*, 1990

³ Robert Solow, "A Contribution to the Theory of Economic Growth", 1956

⁴ Stiglitz, Sen, Fitoussi, *Report by the Commission on the Measurement of Economic Performance and Social Progress*, 2009



mamlakatlarning global reytinglardagi oʻrnini baholashda keng qoʻllaniladi⁵. Jahon iqtisodiy forumi tomonidan eʼlon qilinadigan Global raqobatbardoshlik indeksi iqtisodiy institutlar sifati, infratuzilma rivoji va innovatsion salohiyatni kompleks tarzda tahlil qiladi⁶. Transparency International esa korrupsiya darajasini baholash orqali institutsional shaffoflikka urgʻu beradi.

Tadqiqot metodologiyasi

Mazkur tadqiqotda Oʻzbekiston Respublikasining xalqaro reyting va indekslardagi oʻrnini tahlil qilishda kompleks yondashuv qoʻllanildi. Metodologik asos sifatida tizimli tahlil, qiyosiy tahlil hamda statistik umumlashtirish usullaridan foydalanildi. Xususan, turli xalqaro tashkilotlar — Jahon banki, Jahon iqtisodiy forumi, Transparency International va BMT Taraqqiyot Dasturi tomonidan eʼlon qilingan reyting va indeks maʼlumotlari asosiy empirik baza sifatida tanlab olindi. Tadqiqot jarayonida 2023–2026 yillar oraligʻidagi koʻrsatkichlar dinamikasi oʻrganilib, ularning oʻzgarish tendensiyalari solishtirildi hamda mamlakatning umumiy rivojlanish yoʻnalishlari aniqlashtirildi.

Tahlil va natijalar

1-jadval. Oʻzbekistonning xalqaro reyting va indekslardagi oʻrni⁷

№	Indeks nomi (oʻzbek tilida)	Yil	Oʻrin	Oʻzgarish / izoh
1	Global innovatsiyalar indeksi	2025	79 / 139	2015-yilda 122-oʻrindan +40 pogʻona oʻsish
2	Global innovatsiyalar indeksi	2024	83	Ijobiy dinamika davom etmoqda
3	Iqtisodiy erkinlik indeksi	2026	86	Global oʻrtachadan yuqori
4	Statistik samaradorlik indeksi	2023	62 / 217	+17 pogʻona oʻsish
5	Barqaror rivojlanish maqsadlari indeksi	2025	81	–12 pogʻona pasayish
6	Sanoat raqobatbardoshligi indeksi	2025	88 / 153	Oʻrtacha daraja

⁵ World Economic Forum, *Global Competitiveness Report*, 2020–2023

⁶ World Bank, *World Development Indicators*, 2024

⁷ The World Bank. *World Development Indicators*. — <https://data.worldbank.org>



7	Demokratiya indeksi	2025	146	Past natija
8	Korrupsiyani qabul qilish indeksi	2025	174 / 180	Juda past ko'rsatkich
9	Inson taraqqiyoti indeksi	2025	119	O'rta daraja
10	Global tinchlik indeksi	2025	106	O'rtacha daraja

O'zbekistonning xalqaro reyting va indeksdagi o'rni so'nggi yillarda sezilarli darajada o'zgarib, mamlakat rivojlanishining turli jihatlarini aks ettiruvchi murakkab va ko'p qirrali manzarani shakllantirmoqda. Tahlillar shuni ko'rsatadiki, ayrim yo'nalishlarda barqaror ijobiy natijalarga erishilgan bo'lsa-da, boshqa muhim sohalarda hali ham tizimli muammolar saqlanib qolmoqda.

Xususan, innovatsion rivojlanish ko'rsatkichlari ijobiy dinamikani namoyon etmoqda. Global innovatsiyalar indeksida O'zbekistonning 79-o'rinni egallashi ilmfan, texnologiya va innovatsiyalar sohasida amalga oshirilayotgan islohotlar samaradorligini aks ettiradi. 2015–2025 yillar oralig'ida mamlakatning ushbu indeksdagi o'rni sezilarli darajada yaxshilangani innovatsion siyosatning izchilligi bilan izohlanadi. Ta'lim tizimining modernizatsiyasi, axborot-kommunikatsiya texnologiyalarining rivojlanishi va startup ekotizimining shakllanishi bu jarayonda muhim omillar sifatida namoyon bo'lmoqda. Shu bilan birga, ilmiy ishlanmalarni tijoratlashtirish darajasining pastligi ushbu yo'nalishda mavjud muammolardan biri hisoblanadi.

Iqtisodiy erkinlik indeksi bo'yicha erishilgan natijalar ham ijobiy baholanishi mumkin. 60,3 ball bilan 86-o'rinni egallash mamlakatda iqtisodiy liberallashtirish jarayonlari izchil amalga oshirilayotganini ko'rsatadi. Valyuta siyosatining erkinlashtirilishi, tashqi savdo tartiblarining soddalashtirilishi hamda investitsiya muhitining yaxshilanishi ushbu ko'rsatkichning oshishiga xizmat qilgan. Shunga qaramay, davlatning iqtisodiyotdagi yuqori ulushi va ayrim tarmoqlarda raqobat muhitining yetarli darajada shakllanmaganligi iqtisodiy erkinlikni to'liq ta'minlashga to'sqinlik qilmoqda.



Statistik samaradorlik indeksida kuzatilgan sezilarli o'sish alohida e'tiborga loyiqdir. Qisqa muddat ichida yuqori pog'onalarga ko'tarilish mamlakatda statistik tizimning ochiqligi va ishonchliligi ortib borayotganini anglatadi. Bu esa, o'z navbatida, investorlar ishonchini mustahkamlash va boshqaruv jarayonlarining shaffofligini ta'minlashda muhim ahamiyat kasb etadi.

Biroq barqaror rivojlanish maqsadlari indeksida qayd etilgan pasayish ijtimoiy va ekologik muammolar mavjudligini ko'rsatadi. Mazkur holat iqtisodiy o'sish natijalarining barcha qatlamlar o'rtasida yetarli darajada taqsimlanmayotganini hamda ekologik barqarorlik masalalari dolzarbligicha qolayotganini anglatadi. Shu jihatdan iqtisodiy siyosatni ijtimoiy va ekologik omillar bilan uyg'unlashtirish zarurati kuchaymoqda.

Sanoat raqobatbardoshligi indeksidagi o'rtacha natijalar iqtisodiyotning tarkibiy cheklovlarini aks ettiradi. Yuqori texnologiyali ishlab chiqarishning yetarli darajada rivojlanmaganligi, eksport tarkibining diversifikatsiya darajasi pastligi va qo'shilgan qiymat ulushining yetarli emasligi sanoatning global bozordagi raqobatbardoshligini cheklamoqda.

Eng muhim muammolar institutsional rivojlanish bilan bog'liq ko'rsatkichlarda namoyon bo'lmoqda. Demokratiya indeksi va korrupsiyani qabul qilish indeksidagi past o'rinlar davlat boshqaruvi tizimida shaffoflik va samaradorlik yetarli darajada emasligini ko'rsatadi. Ayniqsa, korrupsiya darajasining yuqoriligi investitsiya muhitiga salbiy ta'sir ko'rsatib, iqtisodiy rivojlanishning barqarorligini cheklovchi asosiy omillardan biri bo'lib qolmoqda. Shu bois institutsional islohotlarni chuqurlashtirish, huquq ustuvorligini ta'minlash va korrupsiyaga qarshi kurashni kuchaytirish ustuvor vazifa hisoblanadi.

2-jadval. Umumiy trend⁸

Ko'rsatkich	Natija
Yaxshilangan indekslar soni	6 ta
Yomonlashgan indekslar soni	7 ta
O'zgarishsiz qolgan	2 ta
Umumiy holat	Notekis rivojlanish

⁸ World Bank, United Nations Development Programme va Transparency International ma'lumotlari asosida muallif hisob-kitobi.



Jadval ma'lumotlari asosida umumiy holatni tahlil qilganda, o'rganilayotgan ko'rsatkichlar dinamikasida muvozanatsiz rivojlanish kuzatilayotganini ko'rish mumkin.

Xususan, 6 ta indeks yaxshilangan bo'lsa-da, 7 ta indeks yomonlashgan. Bu holat ijobiy o'zgarishlar mavjudligini bildirsa-da, salbiy o'zgarishlar soni biroz yuqoriroq ekanini ko'rsatadi. Natijada umumiy tendensiya barqaror o'sish emas, balki tebranish xarakteriga ega bo'lgan jarayon sifatida namoyon bo'lmoqda.

Shuningdek, 2 ta indeks o'zgarishsiz qolganligi tizimda ayrim ko'rsatkichlar barqarorligini saqlab turganini anglatadi. Biroq bu barqarorlik umumiy ijobiy dinamikani kuchaytirishga yetarli bo'lmagan.

Umuman olganda, "notekis rivojlanish" degan xulosa to'g'ri qo'yilgan, chunki yaxshilanishlar va yomonlashishlar o'rtasida sezilarli muvozanat yo'q. Bu esa tahlil qilinayotgan sohada kompleks yondashuv zarurligini, ya'ni zaiflashgan indekslarni barqarorlashtirish va ijobiy o'sish ko'rsatkichlarini kengaytirish lozimligini bildiradi.

Shu bilan birga, tahlil natijalari shuni ko'rsatadiki, xalqaro reytinglardagi o'zgarishlar alohida sohalarning o'zaro uyg'un rivojlanmaganligi bilan ham bog'liqdir. Ayrim indekslardagi ijobiy siljishlar asosan islohotlarning tezkor joriy etilishi bilan izohlanar ekan, boshqa yo'nalishlardagi sustlashuv tizimli omillar, xususan institutsional muhit va boshqaruv samaradorligidagi cheklovlar bilan bog'liq.

Xulosa

O'zbekiston Respublikasining xalqaro reyting va indekslardagi o'rnini tahlil qilish natijalari mamlakat rivojlanish jarayoni bir yo'nalishli emas, balki ko'p qatlamli va ichki ziddiyatlarga ega ekanini ko'rsatadi. Ayrim sohalarda, xususan innovatsion faoliyat, statistik tizimning ochiqqligi hamda iqtisodiy erkinlik bo'yicha ijobiy siljishlar kuzatilgan bo'lsa-da, institutsional sifat, korrupsiyaga qarshi kurash va demokratik boshqaruv yo'nalishlarida sezilarli cheklovlar saqlanib qolmoqda. Bu holat milliy iqtisodiyotning xalqaro reytinglardagi umumiy pozitsiyasi barqaror emasligini va u ko'proq fragmentar rivojlanish xususiyatiga ega ekanini anglatadi.



Tahlil shuni ham ko'rsatadiki, xalqaro indekslardagi o'zgarishlar iqtisodiy islohotlarning tezligi va chuqurligi bilan bevosita bog'liq bo'lib, ayrim natijalar qisqa muddatli tashkiliy o'zgarishlar hisobiga yaxshilangan bo'lsa, uzoq muddatli barqarorlikni ta'minlovchi institutsional omillar hali yetarli darajada mustahkamlanmagan. Ayniqsa, davlat boshqaruvi sifati, huquq ustuvorligi va iqtisodiyotda raqobat muhitining shakllanishi kabi omillar umumiy reyting natijalariga sezilarli ta'sir ko'rsatishda davom etmoqda.

Shu bilan birga, empirik tahlil natijalari mamlakatda rivojlanish salohiyati mavjud ekanini tasdiqlaydi. Innovatsion tizimning shakllanishi, axborot texnologiyalarining kengayishi va iqtisodiy ochiqlik darajasining ortib borishi kelgusida ijobiy dinamika uchun asos bo'lib xizmat qilishi mumkin. Biroq ushbu salohiyatning to'liq ro'yobga chiqishi uchun iqtisodiy islohotlar institutsional islohotlar bilan uyg'un holda olib borilishi zarur.

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**SO‘LAK ASOSIDAGI «LIQUID BIOPSY»
TEXNOLOGIYALARINING OG‘IZ BO‘SHLIG‘I
KASALLIKLARINI ERTA TASHXISLASHDAGI
ISTIQBOLLARI**

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ANNOTATSIYA

Maqolada so‘lak asosidagi «liquid biopsy» texnologiyalarining og‘iz bo‘shlig‘i kasalliklarini, xususan og‘iz bo‘shlig‘i yassi hujayrali karsinomasi (OSCC), og‘iz shilliq qavatining saratonoldi o‘zgarishlari (OPMD) va og‘iz qizil yassi temiratkisini (OLP) erta aniqlashdagi istiqbollari tahlil qilindi. Ish birlamchi klinik tajriba emas, balki 2024–2026-yillardagi sistematik sharhlar, meta-tahlillar va alohida klinik tadqiqotlarning ikkilamchi dalillar sintezidir. 2026-yilgi 18 tadqiqot va 1647 ishtirokchini qamrab olgan umumiy OSCC meta-tahlilida so‘lak biomarkerlarining sezgirligi 0,64, spetsifikligi 0,71 va AUC 0,75 bo‘lgan. Alohida so‘lak miRNK meta-tahlilida sezgirlik/spetsifiklik 0,76/0,79 va AUC 0,84, uch markerli IL-8–CYFRA21-1–CD44 paneli haqidagi sintezda esa 0,88/0,90 va AUC 0,92 qayd etilgan. OLP uchun so‘lak miRNK meta-tahlilida sezgirlik 0,80, spetsifiklik 0,89 va AUC 0,93 bo‘lgan; bu natija OSCC ko‘rsatkichi sifatida talqin qilinmaydi. 2026-yilgi 81 ishtirokchili tadqiqotda CA125 medianasi sog‘lomlarda 5,75, OPMDda 14,11 va OSCCda 72,81 U/ml bo‘lgan. Keng tarqalgan kasallik skriningiga tatbiq etishdan oldin tashqi validatsiya, standart namunaviy protokol va klinik xavf bilan integratsiya zarurligi asoslandi.

Kalit so‘zlar: so‘lak, liquid biopsy, og‘iz saratoni, OSCC, OPMD, miRNK, ekzosoma, hujayrasiz DNK, oqsil biomarkerlari, erta tashxis.

АННОТАЦИЯ

В статье анализируются перспективы технологии слюнной «жидкой биопсии» для раннего выявления заболеваний полости рта, включая плоскоклеточный



рак (OSCC), потенциально злокачественные заболевания слизистой (OPMD) и красный плоский лишай полости рта (OLP). Работа представляет собой вторичный синтез систематических обзоров, метаанализов и отдельных клинических исследований 2024–2026 гг., а не первичное клиническое исследование. В метаанализе 2026 года (18 исследований, 1647 участников) объединённая чувствительность слюнных маркеров OSCC составила 0,64, специфичность — 0,71, AUC — 0,75. Для слюнных микроРНК показатели составили 0,76/0,79 и AUC 0,84; для комбинированной панели IL-8–CYFRA21-1–CD44 — 0,88/0,90 и AUC 0,92. При OLP метаанализ слюнных микроРНК показал чувствительность 0,80, специфичность 0,89 и AUC 0,93; данный показатель не переносится на диагностику OSCC. Анализ CA125 у 81 участника выявил медианы 5,75, 14,11 и 72,81 Ед/мл в здоровой, OPMD и OSCC группах. Слюнная жидкая биопсия рассматривается как вспомогательный инструмент триажа, но не замена гистопатологической биопсии.

Ключевые слова: слюна, жидкая биопсия, рак полости рта, OSCC, OPMD, микроРНК, экзосомы, внеклеточная ДНК, белковые биомаркеры, ранняя диагностика.

ABSTRACT

This paper reviews the prospects of saliva-based liquid biopsy for early detection of oral diseases, with an emphasis on oral squamous cell carcinoma (OSCC), oral potentially malignant disorders (OPMDs), and oral lichen planus (OLP). The article is a secondary synthesis of systematic reviews, meta-analyses, and individual clinical studies published in 2024–2026, not a primary clinical trial. A 2026 broad diagnostic meta-analysis including 18 studies and 1,647 participants reported pooled salivary-biomarker sensitivity of 0.64, specificity of 0.71, and AUC of 0.75 for OSCC. A separate salivary-miRNA meta-analysis yielded sensitivity/specificity of 0.76/0.79 and AUC 0.84, whereas a selected IL-8–CYFRA21-1–CD44 panel synthesis reported 0.88/0.90 and AUC 0.92. For OLP, a distinct salivary-miRNA meta-analysis found sensitivity 0.80, specificity 0.89, and AUC 0.93; these results must not be extrapolated to OSCC. In a recent 81-participant study, median salivary CA125 values were 5.75, 14.11, and 72.81 U/ml in healthy, OPMD, and OSCC groups, respectively. Salivary liquid biopsy could complement oral examination and risk-based referral, but current heterogeneity, spectrum bias, limited early-stage



sampling, and insufficient external validation preclude its use as an independent diagnostic substitute for tissue biopsy.

Keywords: saliva, liquid biopsy, oral cancer, OSCC, OPMD, microRNA, extracellular vesicles, cell-free DNA, protein biomarkers, early detection.

KIRISH

Og'iz bo'shlig'i kasalliklarini erta tashxislashda asosiy muammolardan biri dastlabki molekulyar o'zgarishlar bilan klinik jihatdan ko'rinadigan belgilar o'rtasidagi vaqt tafovutidir. Ayniqsa OSCC va OPMDni dastlabki bosqichlarda aniqlash davolash strategiyasi hamda kuzatuvni o'z vaqtida tanlash uchun muhim. Hozirgi amaliyotda klinik ko'rik va shubhali o'choqning to'qima biopsiyasi tashxisning asosiy ustunlari bo'lib qoladi (Wijaya va boshq., 2026).

«Liquid biopsy» organizm suyuqliklaridagi molekulyar ko'rsatkichlarni o'lchash konsepsiyasi bo'lib, so'lak uning og'iz bo'shlig'i kasalliklariga tatbiq etilishi uchun qulay namunadir. So'lakda hujayrasiz DNK (cfDNA), hujayradan tashqari vezikulalar (EV/ekzosomalar), miRNK, oqsillar, metabolitlar va yallig'lanish markerlarini aniqlash mumkin. Og'iz to'qimalari bilan bevosita kontakt uni biologik jihatdan jozibador qiladi, lekin shu kontakt mahalliy yallig'lanishdan kelib chiqadigan spetsifiklik muammosini ham yuzaga keltiradi.

An'anaviy biopsiyaning o'rnini bosish emas, balki yuqori xavfli bemorlarni ustuvorlashtirish va dinamik monitoring uchun yordamchi vosita yaratish dolzarb vazifadir. To'qima biopsiyasi histopatologik daraja, invaziya, tumor differentiation va differensial tashxisni belgilashda zarur; so'lakdagi ko'rsatkichlar esa ko'pincha o'choq joyini yoki uning histologik turini mustaqil belgilay olmaydi.

Molekulyar markerlar bo'yicha alohida kichik tadqiqotlar juda yuqori AUC ko'rsatishi mumkin. Biroq 2026-yilgi keng meta-tahlilda barcha marker va protokollar bo'yicha birlashtirilgan sezgirlik atigi 0,64, spetsifiklik 0,71 bo'ldi; sezgirlik va spetsifiklikka oid heterojenlik ham yuqori bo'lgan (Wijaya va boshq., 2026). Shu bois klinik istiqbolni baholashda izolyatsiyalangan eng yaxshi tadqiqot natijasiga emas, reproduksiyanadigan umumiy dalillarga tayanish kerak.

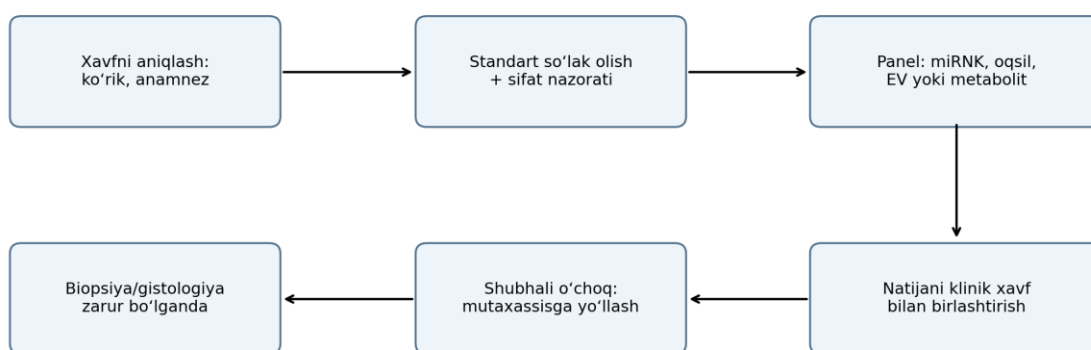
So'lakning ustunliklari — invaziv bo'lmagan, qayta-qayta olinadigan, transporti nisbatan qulay va multimodal molekulyar tahlilga yaroqli biologik material ekanidir. Amaliy cheklovlarga esa ovqatdan keyingi vaqt, og'iz gigiyenasi, qon kontaminatsiyasi, mikrobiom, so'lak ajralish tezligi, preparat ekspozitsiyasi, chekkanlik va yallig'lanish kabi omillar kiradi. Ular markerdagi haqiqiy patologik signalni pasaytirishi yoki sun'iy kuchaytirishi mumkin.



O'zbekiston stomatologiyasida og'iz shilliq qavatining saratonoldi kasalliklarini erta aniqlash va mahalliy onkologik diagnostikani rivojlantirishga oid ishlar mavjud. Kamilov, Kadyrbaeva va Aripova muallifligidagi tadqiqotlar minimal invaziv optik baholashga qaratilgan, mahalliy boshqa ishlar esa so'lak bezi patologiyasi va morfologik onkologik tashxisni o'rgangan. Mazkur ishlar so'lakka asoslangan molekulyar «liquid biopsy» uchun bevosita klinik validatsiya deb ko'rsatilmaydi, balki mahalliy diagnostik kontekst sifatida keltiriladi.

Tadqiqotning maqsadi so'lakdagi miRNK, EV, cfDNA, oqsil va metabolit biomarkerlarining OSCC, OPMD va ayrim boshqa og'iz shilliq qavati kasalliklarini erta aniqlashdagi imkoniyatlarini baholash, alohida meta-tahlil statistikalarini qiyosiy talqin qilish va klinik joriy etish uchun xavfsiz bosqichli algoritim taklif qilishdan iborat.

So'lak «liquid biopsy»: klinik yordamchi algoritim



Muhim: salbiy test klinik shubhani bekor qilmaydi; musbat test saraton tashxisi emas.

1-rasm. So'lak «liquid biopsy» natijalarini klinik ko'rik va histopatologiya bilan birlashtirishning taklif etilgan algoritmi.

METODOLOGIYA VA ADABIYOTLAR TAHLILI

Ushbu maqola sistematik sharh sifatida ro'yxatdan o'tkazilmagan va yangi bemorlar ma'lumotlari yig'ilmagan. U PubMed, xalqaro ochiq nashrlar va O'zbekiston jurnallarida 2024–2026-yillardagi asosiy meta-tahlil, sistematik sharh va ayrim birlamchi klinik tadqiqotlarni qiyosiy, narrativ sintez qilish usulida tayyorlandi. Miqdoriy ma'lumotlar har bir nashrning o'z populyatsiyasi va reference standardi doirasida talqin qilindi.

Birlamchi diagnostik mezonlar sezgirlik (Se), spetsifiklik (Sp), receiver-operating-characteristic ostidagi maydon (AUC), ba'zi ishlarda diagnostic odds ratio (DOR)



va klinik biomarker konsentratsiyasidan iborat. Se kasallik mavjud bemorlarni topish ulushi, Sp sog'lomlarni to'g'ri chiqarib tashlash ulushi, AUC esa turli thresholdlarda ajratish qobiliyatini bildiradi. Bir kasallik yoki biomarker sinfidagi meta-tahlillar boshqa kasalliklar meta-tahlili bilan umumiy pooled estimate yaratish uchun birlashtirilmadi.

Wijaya va hammualliflar (2026) 18 tadqiqot, 1647 ishtirokchi va 45 diagnostik datasetni o'z ichiga olgan bivariate random-effects meta-tahlilda OSCC uchun umumiy Se 0,64 (95% CI 0,59–0,69), Sp 0,71 (0,66–0,76), DOR 4,53 va AUC 0,75 (0,71–0,79) natijalarini taqdim etgan. Mazkur natija dastlabki skrining uchun paneldan mustaqil universal qo'llashning cheklanganini ko'rsatadi.

Salivary miRNA bo'yicha alohida Wijaya va hammualliflar (2026) meta-tahlilida 19 tadqiqotning saliva, serum va plasma subguruhlariga ajratilgan natijalari tahlil qilingan. So'lak miRNK uchun pooled Se 0,76, Sp 0,79 va AUC 0,84 bo'lgan. Qon biomarkerlarini so'lakdan ustun yoki past deb qat'iy tavsiflash bu yerda maqsad emas: namuna tanlash usuli va tadqiqotlar taqsimoti farqli.

2025-yilgi IL-8, CYFRA21-1 va CD44 haqidagi biomarker sintezi 20 muvofiq tadqiqotni kiritgan. Unda individual AUC qiymatlari tegishlicha 0,88, 0,90 va 0,91, kombinatsion panel esa 0,92 AUC, 0,88 Se va 0,90 Sp ko'rsatgan. Panelga oid natija turli mustaqil klinikalardagi ko'p markazli tashqi validatsiya bilan hali universal klinik test maqomini olmagan.

OSCCdan farqli klinik vazifa sifatida Koopaie va hammualliflar (2024) OLPga oid 14 tadqiqotni sistematik ko'rib, beshtasini meta-tahlilga kiritgan. OLPni so'lak miRNK asosida farqlash uchun pooled Se 0,80, Sp 0,89 va AUC 0,93 ko'rsatgan. OLP biomarkerlarining ba'zilar OSCC bilan umumiy bo'lishi mumkin, ammo OLP meta-tahlil natijasi saraton uchun Se/Sp deb berilmasligi kerak.

Boshqa nisbatan yaqindagi birlamchi tadqiqotda Shukla va hammualliflar (2026) 81 ishtirokchini uch guruhga ajratgan: sog'lom (n=28), OPMD (n=27) va OSCC (n=26). So'lakdagi CA125 medianalari mos ravishda 5,75; 14,11 va 72,81 U/ml bo'lgan; umumiy farq $p < 0,001$. Bu kesimiy dizayn biomarkerning kasallik bilan assotsiatsiyasini ko'rsatadi, ammo prospektiv ravishda malign transformatsiyani bashorat qilishini isbotlamaydi.

Ekzosomalar va hujayradan tashqari vezikulalar to'g'risidagi 2025-yilgi sharh 23 ta head-and-neck cancer tadqiqotini qamrab olgan. Vezikulalar miRNK hamda oqsillarni tashishi mumkin va markazlashgan molekulyar tahlilga mos, lekin ularni ajratish, kontaminatsiyani nazorat qilish, son va o'lchamni standartlashtirish usullari



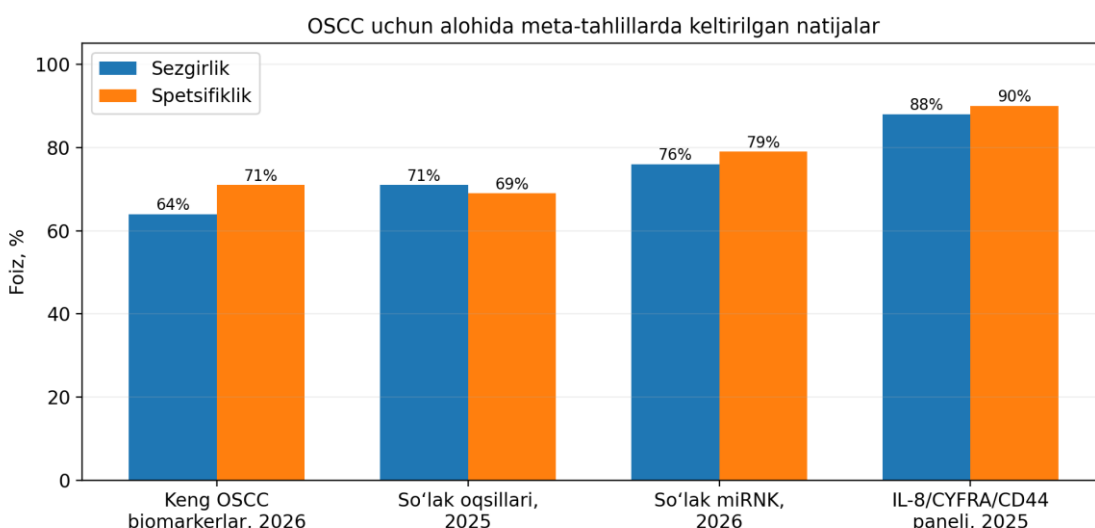
bir xillashmagan. Bu ko'rsatkichni tayyor klinik skrining performancei sifatida tushunmaslik kerak.

Yo'nalish	Tekshirilgan ma'lumot va talqin
Barcha OSCC markerlari	2026 meta-tahlil: 18 tadqiqot, 1647 ishtirokchi; Se 0,64, Sp 0,71, AUC 0,75. Protokollar heterojen.
OSCC so'lak miRNK	2026 alohida meta-tahlil: 19 tadqiqotning suyuqlik subguruhlar; Se 0,76, Sp 0,79, AUC 0,84.
OSCC protein paneli	2025 IL-8/CYFRA21-1/CD44 sintezi: 20 tadqiqot; panel Se 0,88, Sp 0,90, AUC 0,92.
OLP so'lak miRNK	2024 sistematik sharh 14 tadqiqot, meta-tahlil 5; Se 0,80, Sp 0,89, AUC 0,93. Boshqa kasallik.
OPMD–OSCC CA125	2026 kesimiy tadqiqot: 81 ishtirokchi; mediana kasallik guruhiga qarab oshgan; prospektiv prediktor emas.
So'lak EV/ekzosoma	2025 sharh: 23 tadqiqot; molekulyar signallar istiqbolli, standart ajratish/validatsiya yetishmaydi.

1-jadval. Turli yo'nalishdagi dalillar va ularning muhim cheklovlari.

NATIJALAR

Dalillar sintezi OSCC uchun so'lak biomarkerlarining umumiy klinik samarasi va alohida tanlangan panellar samarasi orasida sezilarli farq borligini ko'rsatdi. Keng qamrovli 2026-yilgi meta-tahlilda sezgirlik 64%, spetsifiklik 71% bo'lgan. Oqsil biomarkerlari bo'yicha alohida 2025-yilgi 28 tadqiqot, 3507 OSCC bemori va 3501 nazoratni qamrab olgan meta-tahlilda esa pooled sezgirlik 71%, spetsifiklik 69% qayd etilgan. Bu ikki tahlilni bitta qo'shma ko'rsatkichga aylantirish to'g'ri emas. miRNK sinfidagi ko'rsatkichlar oqsil sinfidagi ayrim pooled ko'rsatkichlardan farq qilgan; natija qaysi marker, qaysi assay, qanday case-control tanlov va reference standard ishlatilganiga bog'liq. Tanlangan IL-8/CYFRA21-1/CD44 paneli ko'proq diagnostik axborot berishi mumkin, ammo uning 0,92 AUC qiymati barcha klinikalarda shunday bo'lishiga dalil hisoblanmaydi.



2-rasm. OSCC diagnostikasi uchun to'rtta mustaqil dalil sintezidagi sezgirlik va spetsifiklik. Tadqiqotlar birlashtirilmagan.

Dalil manbai	Keltirilgan natija
Keng qamrovli biomarker meta-tahlili	2026, 18 tadqiqot, 1647 ishtirokchi: Se 0,64 (0,59–0,69); Sp 0,71 (0,66–0,76); DOR 4,53; AUC 0,75.
So'lak oqsillari meta-tahlili	2025, 28 tadqiqot, OSCC n=3507 va nazorat n=3501: Se 0,71; Sp 0,69; markerlararo farq katta.
So'lak miRNK meta-tahlili	2026, 19 tadqiqotning saliva subguruhi: Se 0,76; Sp 0,79; AUC 0,84.
IL-8/CYFRA21-1/CD44 paneli	2025, 20 tadqiqot sintezi: Se 0,88; Sp 0,90; AUC 0,92; tanlangan panel, boshqa populyatsiya.
Qiyoslash cheklovi	Har bir raqam alohida manbaga tegishli. Klinik testning umumiy tan olingan sensitivity/specificitysi sifatida ko'rsatib bo'lmaydi.

2-jadval. OSCC uchun meta-tahlil statistikalarining qiyosiy talqini.

BIOMARKERLAR VA KASALLIKKA XOS XUSUSIYATLAR

Oqsil markerlarining klinik mohiyati turlicha. IL-8 yallig'lanish va tumor microenvironment bilan, MMP9 ekstrasellyulyar matriks qayta tuzilishi bilan,



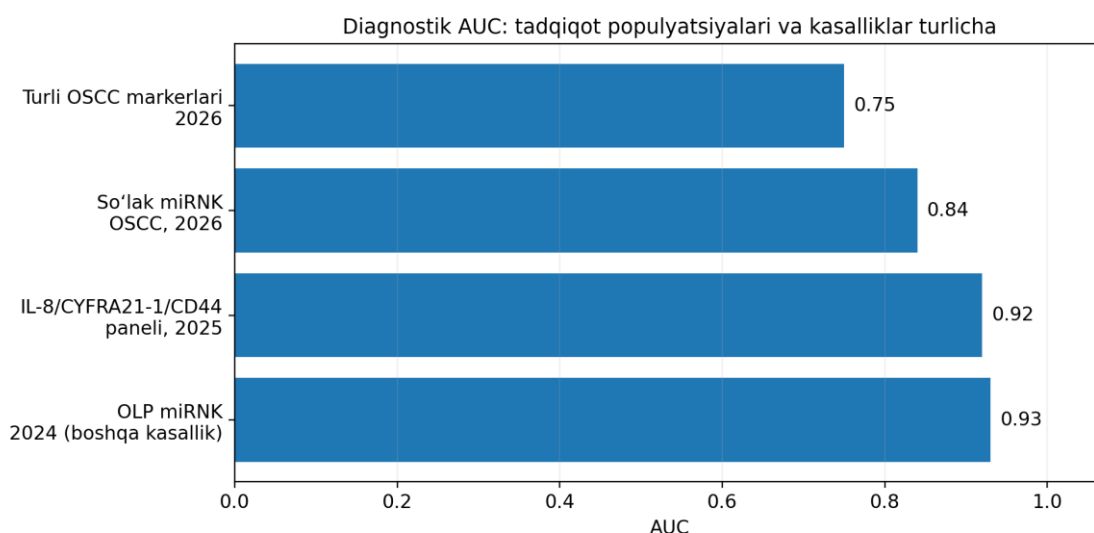
CYFRA21-1 epitelial hujayra parchalanishi bilan, CD44 esa hujayra adhesiyasi va tumor biology bilan bog'liq. Ko'p markerli panel bir vaqtning o'zida bir nechta biologik jarayonni qamrab oladi, ammo periodontal yallig'lanish va boshqa og'iz kasalliklari false-positive signalni kuchaytirishi mumkin.

miRNKlar qisqa, oqsil kodlamaydigan RNK molekulalari bo'lib, transkripsiyadan keyingi gen regulatsiyasida ishtirok etadi. So'lakda miRNKlar erkin yoki EV ichida saqlanishi mumkin. Qisqa segmentlarni qPCR yoki sekvenslash orqali aniqlash ularni molekulyar panelga aylantirish imkonini beradi, lekin extraction yield, qPCR normalizatsiyasi va kontaminatsiya nazoratini standartlashtirish talab etiladi.

cfDNA va ehtimoliy tumor-derived DNK varianti molekulyar spesifiklik nuqtayi nazaridan qiziqarli; shunga qaramay so'lakdagi tumor fraksiyasi har doim ham yuqori emas va o'choq topografiyasi, nekroz, salivary flow hamda preanalitik parchalanish natijaga ta'sir qiladi. cfDNA ni boshqa molekulyar moddalarga birlashtirilgan panel sifatida tekshirish istiqbollidir, lekin 2026-yildagi keng meta-tahlil natijasi bu texnologiyani barcha kishilarga tayyor skrining usuli sifatida tavsiya qilish uchun yetarli emas.

Og'iz shilliq qavatining saratonoldi o'zgarishlarida (OPMD) biomarker kross-seksion klassifikatsiya uchun yaxshi bo'lsa ham, kelgusida saratonga o'tish ehtimolini baholash uchun prospektiv kuzatuv zarur. CA125 bo'yicha 2026-yilgi tadqiqot OPMD va OSCC guruhlarida o'rtasida darajalar farqini ko'rsatgan, biroq bosqich I OSCC guruhidagi bemorlar juda kam bo'lganligi uning haqiqiy erta skrining imkoniyati bo'yicha xulosani cheklaydi.

OLP bo'yicha 2024-yilgi meta-tahlil boshqa klinik maqsadga xizmat qiladi: unda bemorlarni og'iz qizil yassi temiratkisi bo'yicha ajratish tekshirilgan. OLP miRNK AUC 0,93 bo'lishi OSCC prognozi yoki OLPning malign transformatsiyasi uchun avtomatik AUC 0,93 degani emas.



3-rasm. Turli meta-tahlillarning AUC koʻrsatkichlari: OLP alohida kasallik boʻlib, OSCC bilan toʻgʻridan-toʻgʻri tenglashtirilmaydi.

Platforma	Aniqlanadigan signal va zarur nazorat
RT-qPCR / ddPCR	Soʻlak miRNK va cfDNA; normalizatsiya, kontaminatsiya nazorati va limit of detection zarur.
ELISA / multiplex	IL-8, CYFRA21-1, CD44 va boshqa oqsillar; assay batch, lokal yalligʻlanish va calibration muhim.
EV ajratish / proteomika	Ekzosomal miRNK/oqsil; vezikula tozaligi, ekstraktsiya usuli va miqdoriy standart talab etiladi.
Metabolomika	Kichik molekularlar paneli; oziq-ovqat, sutkalik ritm va mikrobiom confounding omillar.
Point-of-care panel	Qisqa turnaround va takroriy screening ehtimoli; avval koʻp markazli tashqi validatsiya va clinical utility zarur.

3-jadval. Biomarker platformalari va klinik tarjima bosqichlari.

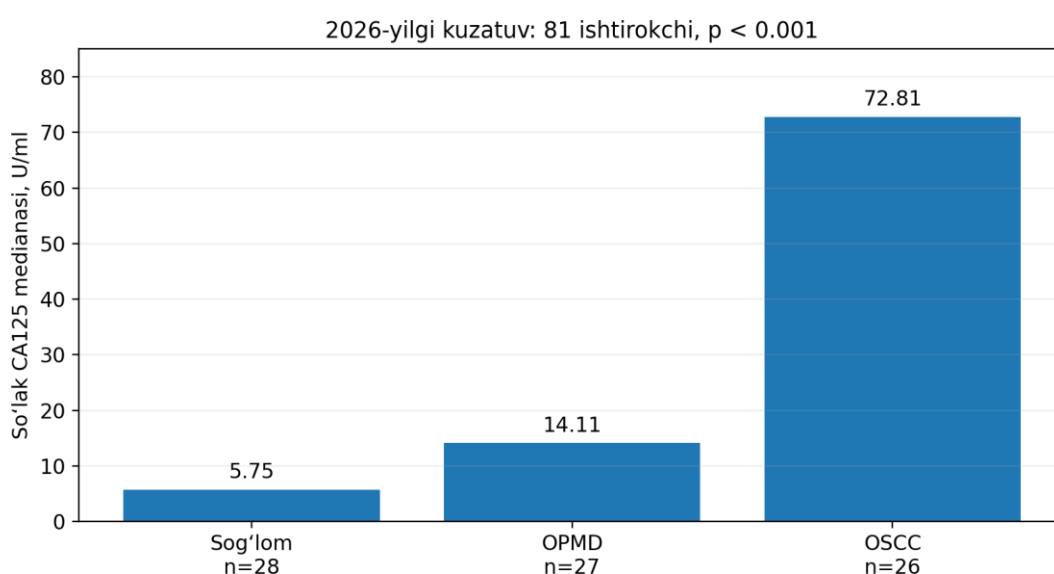
ALOHIDA KLINIK TADQIQOT VA AMALIY STATISTIK TALQIN

Shukla va hammualliflarning 2026-yilgi klinik tadqiqoti CA125 boʻyicha uch guruhli qiyoslashga misol boʻladi: sogʻlom $n=28$, OPMD $n=27$ va OSCC $n=26$. Medianalar 5,75; 14,11; 72,81 U/ml boʻlgan ($p<0,001$). Koʻrsatkich OSCC klinik



bosqichi bilan oʻrtacha musbat bogʻlangan (Spearman $\rho=0,524$; $p=0,006$). Maʼlumot biomarker miqdorida kasallik bilan bogʻliq siljish borligini bildiradi, biroq randomizatsiyalangan yoki prospektiv erta aniqlashning isboti emas.

Tadqiqotdagi OPMD guruhi turli nosologiyalarni qamrab olgan; yosh va jins taqsimoti guruhlararo farqli boʻlishi mumkin. Shuningdek, I-bosqich OSCC juda kam sonli boʻlgani uchun 72,81 U/ml medianani I-bosqichga xos screening threshold sifatida ishlatish mumkin emas. Tahlildagi ROC sinovlari va optimal cut-offlar mustaqil klinik kohortda takrorlanishi zarur.



4-rasm. CA125 medianalari: 2026-yilgi 81 ishtirokchili kesimiy tadqiqot natijalari; individual darajalar va IQRlar grafikda tasvirlanmagan.

Koʻrsatkich	Nashr etilgan natija va izoh
Guruhlar hajmi	Sogʻlom n=28; OPMD n=27; OSCC n=26; jami 81.
CA125 medianasi	Sogʻlom 5,75; OPMD 14,11; OSCC 72,81 U/ml.
Guruhlararo farq	Kruskal–Wallis va post-hoc qiyoslarda $p<0,001$.
Kasallik bosqichi bilan aloqa	Spearman $\rho=0,524$; $p=0,006$; kesimiy assotsiatsiya.
Asosiy cheklov	I-bosqichdagi kuzatuv kam; longitudinal malign transformatsiya va cut-off validatsiyasi yoʻq.

4-jadval. CA125 tadqiqotini klinik talqin qilish.

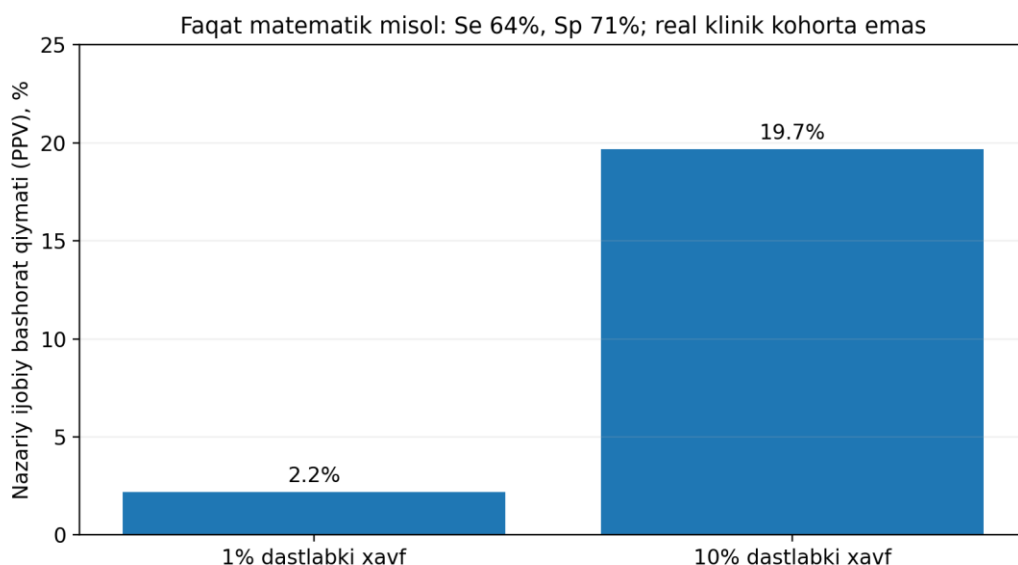
SKRINING, PPV VA KLINIK XAVF

Diagnostic testni amaliyotga joriy etishda sezgirlik va spetsifiklik yetarli emas: ijobiy natijaning haqiqatan kasallikni bildirish ehtimoli, yaʼni positive predictive



value (PPV) bazaviy xavfga kuchli bog'liq. Keng meta-tahlilning umumlashtirilgan Se 0,64 va Sp 0,71 qiymatlarini matematik misolga qo'llasak, dastlabki ehtimol 1% bo'lgan guruhda PPV taxminan 2,2%, 10% bo'lgan yuqori xavfli guruhda esa 19,7% chiqadi. Bu raqamlar tadqiqotdan olingan klinik PPV emas, faqat Bayes formulasi asosida hisoblangan shartli illustratsiyadir.

Shu sababli so'lak testining ehtimoliy amaliy o'rni alohida yuqori xavf omillariga ega bemorlarda qo'shimcha triage sifatida ko'riladi. Masalan, davolashga qaramay bitmayotgan yara, eritroplakiya, leykoplakiya, tamaki/alkogol ekspozitsiyasi va stomatologik ko'rikda shubhali o'choq mavjudligi sababli klinik ko'rik, biopsiya hamda zarur tasvirlash kechiktirilmasligi kerak. Manfiy so'lak testi mutaxassisga yo'llashni bekor qilmaydi.



*5-rasm. Bazaviy xavf o'zgarganda PPVning matematik misoli (Se=0,64; Sp=0,71).
Grafik real bemor kohortasi yoki validatsiya natijasi emas.*

Bosqich	Amaliy talab va xavfsizlik chegarasi
Bemor tanlash	Klinik xavf va shikoyatni birinchi baholash; marker o'zi bilan tashxis qo'yilmaydi.
Namuna olish	Stimulyatsiyasiz so'lak, vaqt, ovqat/chekish, og'iz holati va qon kontaminatsiyasini qayd etish.
Laborator sifat	Analitik sezgirlik, assay reproducibility, batch nazorati, referens interval va preanalitik SOP.
Interpretatsiya	Pretest probability, biomarkerlar paneli, periodontal/infekcion confounderlarni hisobga olish.



Bosqich	Amaliy talab va xavfsizlik chegarasi
Ijobiy natija	Shifokor ko'rigi, shubhali o'choqni maqsadli tekshirish; biopsiya ko'rsatmasi klinik ravishda hal etiladi.
Salbiy natija	Agar o'choq shubhali bo'lsa, kuzatuv yoki biopsiya kechiktirilmaydi.
Validatsiya	Mahalliy ko'p markazli tashqi test; early-stage va OPMD kohortlarida prospektiv monitoring.

5-jadval. So'lak «liquid biopsy»ni klinik algoritmgga kiritish shartlari.

MUHOKAMA

So'lakka asoslangan liquid biopsy klinik qabulda og'iz bo'shlig'i to'qimalarini molekulyar baholash uchun qulay vosita bo'lishi mumkin. Biroq nashrlardagi markaziy savol bitta marker yuqori AUC ko'rsatishidan ko'ra, mustaqil muassasa va boshqa populyatsiyada barqaror natija bera olishidir. 2026-yilgi umumiy meta-tahlil natijasi biomarkerlarning ma'lum sharoitlardagi foydasini ko'rsatsa-da, ko'plab usullar hali tanlangan case-control dizayn bosqichida ekanini eslatadi.

Selection bias muhim masala: klinik jihatdan ravshan yoki rivojlangan OSCC bemorlarini sog'lom nazorat bilan solishtirish oddiy bo'lsa, dastlabki bosqich kasallikni OPMD, periodontal yallig'lanish yoki benign yaradan ajratish anchagina qiyin. Haqiqiy erta tashxis uchun o'xshash simptomga ega nazorat guruhlarida hamda I-II-bosqich OSCC bemorlarini yetarli miqdorda kiritish kerak.

Qon bilan kontaminatsiya, gingival yallig'lanish va mikrobiom oqsil/miRNK profiliga ta'sir qilishi mumkin. Shu sababli bir xil olingan so'lak namunasini turli klinikalarga tarqatish va ularning laborator natijalarini solishtirish texnik hamda biologik reproduksiyalanishni baholash uchun zarur. Testning yoshi, jinsi va og'iz gigiyenasi farqli bemorlardagi kalibratsiyasi alohida tahlil etilishi kerak.

Ko'p markerli panel bir markerga nisbatan kengroq biologik axborot beradi, lekin panel o'lchamining ortishi modelni haddan tashqari moslashtirish (overfitting) xavfini keltirib chiqaradi. Agar markerlar yuzlab bo'lib bemorlar soni o'nlab bo'lsa, ichki testdagi yuqori AUC tasodifiy bo'lishi mumkin. Prospektiv external validation hamda foydali clinical decision threshold bo'yicha natija shuning uchun muhim.



Soʻlak EV/ekzosomalari nazariy jihatdan tumor bilan bogʻliq miRNA va oqsil signalini koʻproq saqlashi mumkin. Biroq EV ni izolatsiya qilish usullari (ultratsentrifugatsiya, filtratsiya, immunocapture va boshqalar) farqli fraksiyalarni toʻplashi sabab cross-study comparability pasayadi. Real-time point-of-care formatga oʻtishdan oldin markerlarni maqsadli, ixcham va analitik

jihatdan reproducible panelga kamaytirish kerak.

OLPni biomarkerlar yordamida tasniflashga oid ijobiy natija juda qiziqarli, ammo klinik maslahatda ikki savol farqlanishi shart: bemorda OLP bormi va ushbu OLP kelajakda malign transformatsiya qiladimi? AUC 0,93 faqat mavjud OLPni ajratish natijasi boʻlib, ikkinchi savolga tayyor javob bermaydi. Ikkinchi savol uchun koʻp yillik prospektiv kohort talab qilinadi.

Oʻzbekiston uchun toʻgʻridan-toʻgʻri tavsiya etiladigan ilmiy yoʻl dastlab katta omics platformasi xarid qilish emas, balki standart soʻlak biobanki va klinik-histopatologik registr yaratishdir. Toshkent, Samarqand, Surxondaryo va boshqa hududlardagi markazlar bir xil anamnez, periodontal status, ogʻiz shilliq qavati kartasi, tasvirlar va biopsy endpointlari boʻyicha ishlasa, mahalliy biomarker validationning ilmiy qiymati sezilarli oshadi.

Qulay klinik dizayn — shubhali shilliq qavat oʻchoqlari bilan kelgan barcha ketma-ket bemorlarda soʻlak namunasi olish, natijani koʻrmasdan klinik va histopatologik reference standardni belgilash, keyin molekulyar panelni test qilish. Shunday dizayn sensitivity, specificity, PPV va NPVni haqiqiy diagnostik vaziyatda baholash imkonini beradi; individual markerlar assay drift, batch effect va oral infection bilan stratifikatsiya qilinadi.

Biopsiya masalasi alohida taʼkidlanishi kerak: salivary liquid biopsy hozircha saraton tashxisini histologik tasdiqlovchi usulni almashtirmaydi. Uning real qiymati yoʻllanma vaqtini qisqartirish, nazoratni individual rejalash va ehtimol davolashdan keyingi recurrence monitoringni qoʻllab-quvvatlashda boʻlishi mumkin; buning uchun ham prospective patient-outcome tadqiqotlar zarur.

XULOSA

Soʻlak asosidagi «liquid biopsy» miRNA, oqsil, EV va boshqa molekulyar signalni invaziv boʻlmagan shaklda oʻlchash orqali ogʻiz boʻshligʻi kasalliklarini erta aniqlashga yordam berishi mumkin.

2026-yilgi keng meta-tahlilda OSCC uchun umumiy sezgirlik 0,64, spetsifiklik 0,71 va AUC 0,75 boʻlgan; ayni paytda individual panel va tanlangan markerdagi yuqori koʻrsatkichlar umumiy aholi skriningi uchun universal klinik accuracyga teng emas.



So‘lak miRNA meta-tahlili (Se 0,76; Sp 0,79; AUC 0,84) va IL-8/CYFRA21-1/CD44 paneli sintezi (Se 0,88; Sp 0,90; AUC 0,92) istiqbolli, ammo boshqa kohortlarda mustaqil validatsiya talab etiladi.

OLPni aniqlashda so‘lak miRNA ko‘rsatkichlari ijobiy bo‘lsa-da (Se 0,80; Sp 0,89; AUC 0,93), ular saratonni aniqlash yoki malign transformatsiyani bashorat qilish ko‘rsatkichlari deb talqin qilinmaydi.

CA125ning sog‘lom, OPMD va OSCC guruhlarida turlicha bo‘lishi molekulyar triage uchun tadqiqot yo‘nalishini asoslaydi, biroq dastlabki bosqichlar bo‘yicha kichik namuna uni klinik screening thresholdi sifatida ishlatishni cheklaydi.

Eng muhim kelgusi vazifalar — standart so‘lak yig‘ish, biomarker panelini optimallashtirish, katta prospective early-stage kohortlar, lokal tashqi validatsiya va klinik-histopatologik reference standard bilan solishtirishdan iborat. So‘lak natijasi hozircha klinik ko‘rik va kerak bo‘lganda biopsyga qo‘shimcha hisoblanadi.

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MAHALLIY XOMASHYOLAR ASOSIDA KORROZIYAGA QARSHI MODDALAR ISHLAB CHIQRISH

Eshqorayev Samariddin

Termiz davlat muhandislik va agrotexnologiya universiteti
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ANNOTATSIYA

Ushbu maqolada mahalliy o'simlik va agro-sanoat xomashyolari asosida ekologik xavfsiz korroziya ingibitorlari ishlab chiqarishning zamonaviy yondashuvlari tahlil qilindi. Tadqiqot adabiyotlar sharhi va analitik sintez shaklida bajarilib, uzum urug'i va po'stlog'i, anor po'stlog'i, yong'oq yashil po'stlog'i, tannin va ligninga boy qishloq xo'jaligi chiqindilarining uglerodli va kam legirlangan po'latlar korroziyasini kamaytirishdagi imkoniyatlari baholandi. O'simlik ekstraktlaridagi polifenollar, tanninlar, flavonoidlar, alkaloidlar va organik kislotalar metall sirtiga adsorbsiyalanib, anod va katod reaksiyalarini sekinlashtiruvchi himoya qatlam hosil qiladi. Nashr etilgan tajribalarda anor po'stlog'i ekstrakti 2 M HCl muhitida 95,8% gacha, uzum urug'i ekstrakti HCl muhitida taxminan 88%, yong'oq yashil po'stlog'i ekstrakti esa 1 M HCl da 82% gacha ingibirlash samaradorligini ko'rsatgan. Mahalliy xomashyodan foydalanishning asosiy afzalliklari — qayta tiklanuvchanlik, past toksiklik, chiqindini valorizatsiya qilish va import qilinadigan sintetik ingibitorlarga qaramlikni kamaytirishdir. Shu bilan birga, tarkibning mavsumiy o'zgaruvchanligi, ekstrakti standartlashtirish, yuqori haroratdagi barqarorlik va uzoq muddatli sanoat sinovlarining yetishmasligi asosiy muammolar bo'lib qolmoqda.

Kalit so'zlar: korroziya, yashil ingibitor, mahalliy xomashyo, o'simlik ekstrakti, tannin, lignin, uzum urug'i, anor po'stlog'i, yong'oq po'stlog'i, po'lat.

АННОТАЦИЯ

В статье проанализированы современные подходы к разработке экологически безопасных ингибиторов коррозии на основе местного растительного и



агропромышленного сырья. Рассмотрен потенциал виноградных косточек и выжимок, кожуры граната, зелёной оболочки грецкого ореха, а также сельскохозяйственных отходов, богатых танинами и лигнином. Полифенолы, флавоноиды, танины, алкалоиды и органические кислоты растительных экстрактов адсорбируются на металлической поверхности и формируют защитный барьер, замедляющий анодные и катодные реакции. По данным опубликованных исследований, экстракт кожуры граната обеспечивал до 95,8% ингибирования мягкой стали в 2 М НСl, экстракт виноградных косточек — около 88%, а экстракт зелёной оболочки грецкого ореха — до 82% в 1 М НСl. Основными преимуществами местного сырья являются возобновляемость, низкая токсичность, утилизация агроотходов и снижение зависимости от импортных синтетических ингибиторов. Основные ограничения связаны со стандартизацией состава, сезонной изменчивостью и недостатком длительных промышленных испытаний.

Ключевые слова: коррозия, зелёный ингибитор, местное сырьё, растительный экстракт, танин, лигнин, виноградные косточки, кожура граната, грецкий орех, сталь.

ABSTRACT

This article analyzes contemporary approaches to developing environmentally friendly corrosion inhibitors from locally available plant and agro-industrial raw materials. The potential of grape seeds and pomace, pomegranate peel, green walnut husk, and tannin- or lignin-rich agricultural residues is reviewed for protecting carbon and low-alloy steels. Polyphenols, tannins, flavonoids, alkaloids, and organic acids present in plant extracts can adsorb on metallic surfaces and form protective films that suppress anodic and cathodic corrosion reactions. Published studies reported inhibition efficiencies of up to 95.8% for pomegranate peel extract in 2 M HCl, approximately 88% for grape seed extract in hydrochloric acid, and up to 82% for green walnut husk extract in 1 M HCl. Key advantages of local biomass include renewability, low toxicity, agricultural-waste valorization, and reduced dependence on imported synthetic inhibitors. Major limitations remain variability of extract composition, standardization, reduced stability at elevated temperature, and insufficient long-term industrial validation.

Keywords: corrosion, green inhibitor, local raw material, plant extract, tannin, lignin, grape seed, pomegranate peel, walnut husk, steel.



KIRISH

Korroziya metall konstruksiyalar, quvurlar, issiqlik almashinish apparatlari, neft-gaz uskunalari, qurilish armaturasi va kimyo sanoati jihozlarining xizmat muddatini qisqartiradigan muhim fizik-kimyoviy jarayondir. Korroziya natijasida metall yo'qotilishi bilan birga energiya, ta'mirlash, avariya xavfi va ekologik zararlar ham ortadi.

An'anaviy korroziya ingibitorlarining ayrimlari xromat, nitrit, fosfat va murakkab sintetik organik birikmalarga asoslangan bo'lib, yuqori samaradorlikka ega bo'lsa-da, toksiklik, bioakkumulyatsiya va utilizatsiya masalalari ularni cheklaydi. Shu sabab yashil kimyo tamoyillariga mos, biologik parchalanadigan va qayta tiklanuvchi xomashyo asosidagi ingibitorlarga qiziqish keskin oshdi.

O'simlik ekstraktlari korroziya ingibitori sifatida bir necha sababga ko'ra istiqbollidir: ularning tarkibida heteroatomlar (O, N, S) va π -elektron tizimlarga ega polifenollar, flavonoidlar, tanninlar, alkaloidlar va boshqa organik molekulalar mavjud. Ushbu moddalarning metall sirtiga adsorbsiyasi faol markazlarni bloklaydi va korroziya reaksiyasining kinetikasini sekinlashtiradi.

Mahalliy agro-sanoat chiqindilarini korroziyaga qarshi materialga aylantirish ikki vazifani bir vaqtning o'zida hal qiladi: chiqindi miqdorini kamaytirish va yuqori qo'shimcha qiymatli texnik mahsulot olish. Uzunmudavlatlik va meva-sabzavotchilik rivojlangan hududlarda uzum urug'i, pomace, anor po'stlog'i va yong'oq qobig'i kabi biomassalar ayniqsa qiziqarli xomashyo bo'la oladi.

Maqolaning maqsadi mahalliy xomashyolar asosida korroziyaga qarshi moddalar ishlab chiqarish uchun istiqbolli xomashyo turlarini, ekstraksiya va sinov metodlarini, ta'sir mexanizmlarini hamda sanoatlashtirish cheklovlarini zamonaviy ilmiy adabiyotlar asosida tahlil qilishdan iborat.

METODOLOGIYA VA ADABIYOTLAR TAHLILI

Ushbu tadqiqot strukturaviy narrativ sharh va dalillar sintezi sifatida bajarildi. 2020–2026-yillardagi yashil korroziya ingibitorlariga bag'ishlangan zamonaviy sharhlar, shuningdek uzum urug'i, anor po'stlog'i va yong'oq yashil po'stlog'i ekstraktlarining po'lat korroziyasiga ta'sirini eksperimental baholagan ishlar tanlandi.

Baholash mezonlari sifatida ingibirlash samaradorligi (IE%), korroziya tezligi, potentiodynamik polarizatsiya, elektroximik impedans spektroskopiyasi (EIS), charge-transfer resistance (Rct), adsorption isotherm, sirt morfologiyasi (SEM/AFM) va funksional guruhlar (FTIR) qabul qilindi.



Mahalliy xomashyo tushunchasi aniq bir viloyat statistikasi bilan emas, O'zbekiston sharoitida agro-sanoat zanjiridan olinishi mumkin bo'lgan uzum, anor, yong'och va lignotsellyulozali chiqindi biomassalar asosida shakllantirildi. Birlamchi laboratoriya ma'lumotlari mavjud bo'lmagani sababli natijalar bo'limida muallif tomonidan uydirma korroziya ko'rsatkichlari yaratilmagan.

Ingibirlash samaradorligi odatda $IE\% = [(CR_0 - CR_i)/CR_0] \times 100$ yoki elektrokimyoviy R_{ct} va korroziya tok zichligi asosidagi tenglamalar orqali hisoblanadi. Natijalarni taqqoslashda elektrolit tarkibi, inhibitor konsentratsiyasi, harorat va immersion vaqti bir xil bo'lmagani inobatga olindi.

NATIJALAR

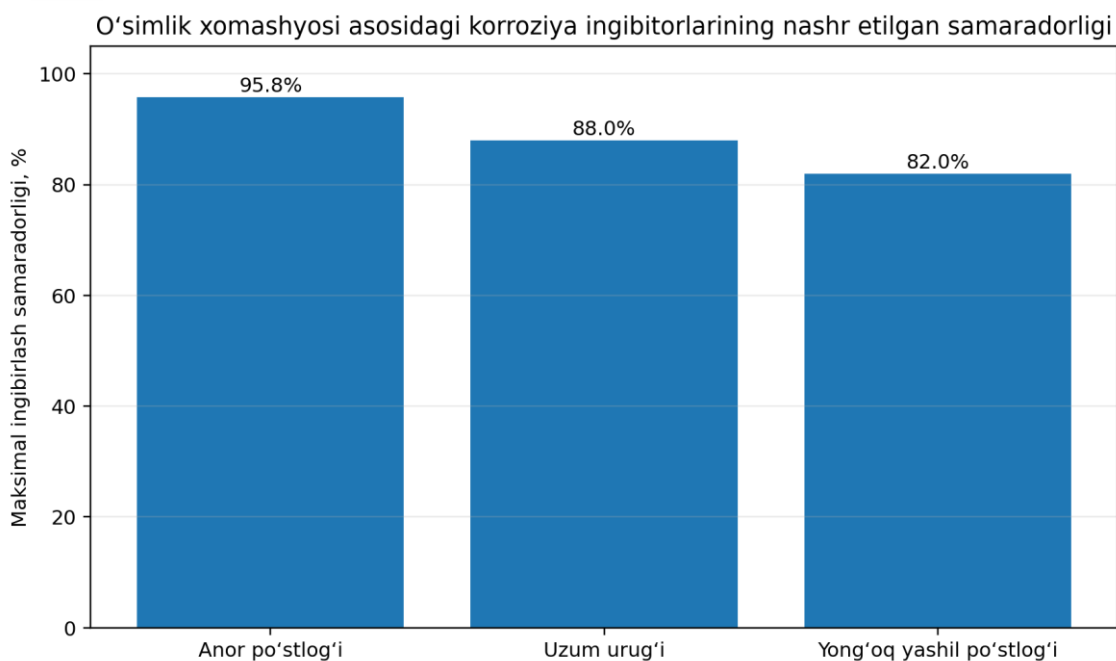
Adabiyotlar sintezi mahalliy biomassa asosidagi korroziya ingibitorlarining texnologik qiymati asosan polifenol/tannin miqdori, ekstraksiya usuli, inhibitor konsentratsiyasi va korrozion muhitga bog'liq ekanini ko'rsatdi.

Xomashyo	Faol komponentlar	Sinov muhiti	Maksimal IE %	Amaliy izoh
Anor po'stlog'i	Ellag kislota, tannin, polifenollar	2 M HCl, yumshoq po'lat	95,8%	Yuqori samaradorlik; mixed-type inhibitor
Uzum urug'i	Proantosianidin, katexin, epikatexin	HCl, yumshoq po'lat	≈88%	300 ppm atrofida EIS bo'yicha yuqori himoya



Yongʻoq yashil poʻstlogʻi	Juglon, flavonoidlar, fenollar	1 M HCl, uglerodli poʻlat	≈82%	Langmuir adsorbsiy asi; harorat oshishi bilan samarado rlik pasayadi
Vegetal tanninlar	Gallotannin/ellagitannin/kon densirlangan tannin	Turli kislotali muhit	manba ga bogʻliq	Metall bilan kompleks va adsorbsio n qatlam hosil qiladi
Lignin/lignosu lfonat	Aromatik fenolik tuzilma	Neytral/kis lotali tizimlar	formul aga bogʻliq	Suvda eruvchan derivatlar kompozit ingibitor uchun qulay

1-jadval. Mahalliy xomashyo sifatida koʻrib chiqilishi mumkin boʻlgan yashil ingibitorlar.



1-diagramma. Nashr etilgan tadqiqotlardagi maksimal ingibirlash samaradorligi (turli eksperimental sharoitlar sabab to'g'ridan-to'g'ri reyting emas).

Taqqoslangan uchta xomashyo orasida anor po'stlog'i ekstrakti eng yuqori nashr etilgan qiymatlardan birini ko'rsatgan: 2 M HCl muhitida yumshoq po'lat uchun 95,8% gacha. Uzun urug'i ekstrakti 300 ppm konsentratsiyada HCl muhitida taxminan 88% EIS samaradorligini ko'rsatgan. 2024-yilgi yong'oq yashil po'stlog'i tadqiqotida esa samaradorlik 27–82% oralig'ida bo'lib, optimal konsentratsiyada metall sirtining qo'polligi taxminan 22% kamaygan.

Bosqich	Tavsiya etiladigan usul	Nazorat parametri	Maqsad	Kutiladigan natija
Xomashyo tayyorlash	Yuvish, 50–60°C quritish, maydalash	Namlik, zarracha o'lchami	Takrorlanuvchan xomashyo	Ekstraksiya barqarorligi
Ekstraksiya	Suv/etanol yoki suv-etanol aralashmasi	S/L nisbati, vaqt, T	Polifenol/tanninn i ajratish	Faol ekstrakt

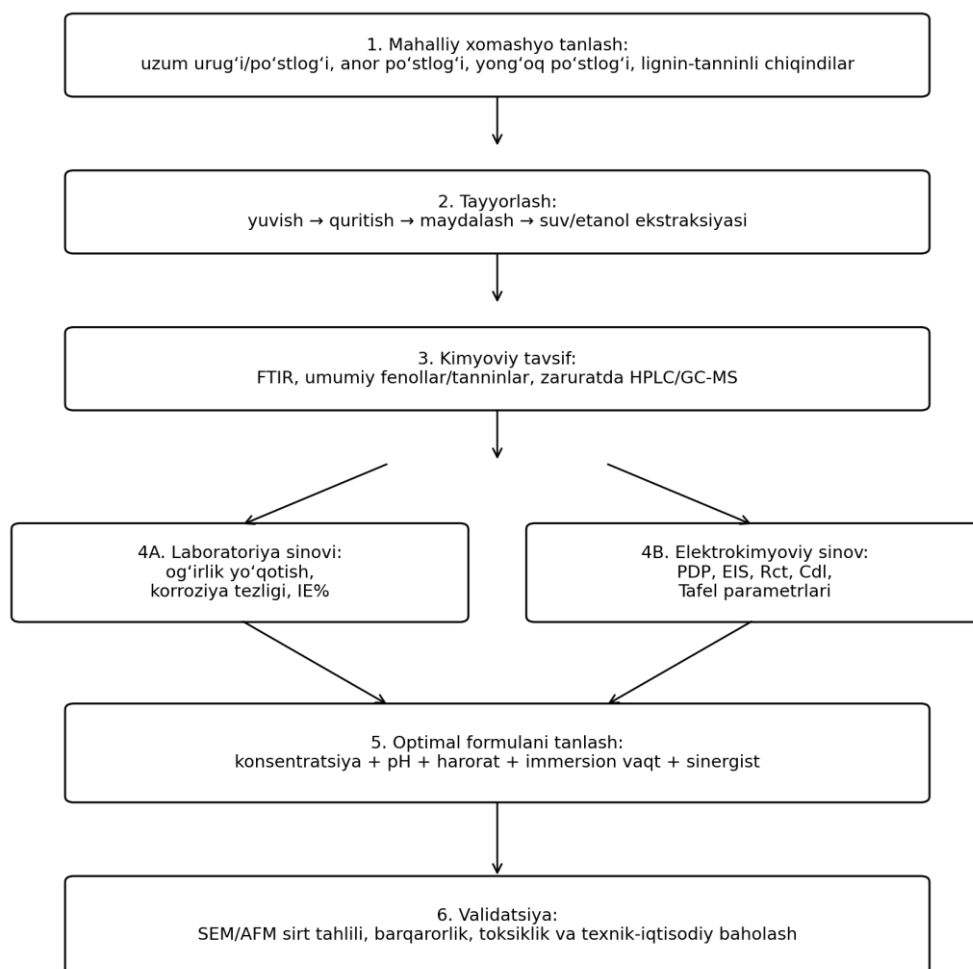


Kimyoviy tahlil	FTIR, TPC/TFC, HPLC zaruratda	Fenol/tanni n profili	Faol komponentni standartlash	Partiyalararo bir xillik
Korroziya testi	Og'irlik yo'qotish + PDP + EIS	CR, Icorr, Rct, Cdl	IE% va mexanizmni aniqlash	Optimal konsentratsiy a
Sirt tahlili	SEM/AFM/ED S	Qo'pollik, korroziya mahsuloti	Himoya qatlamini tasdiqlash	Mexanistik dalil
Sanoat validatsiyas i	Pilot kontur/kupon sinovi	pH, T, vaqt, oqim	Real muhitda barqarorlik	Texnik- iqtisodiy qaror

2-jadval. Mahalliy xomashyodan korroziya ingibitori ishlab chiqishning tavsiya etiladigan laboratoriya metodologiyasi.



Mahalliy xomashyo asosida yashil korroziya ingibitori ishlab chiqish algoritmi



1-rasm. Mahalliy biomassa asosida yashil korroziya ingibitori ishlab chiqish algoritmi (mualliflik sxemasi).

Muammo	Sabab	Texnologik yechim	Baholash mezoni
Ekstrakt tarkibi o'zgaruvchan	Nav, mavsum, quritish sharoiti	TPC/tannin bo'yicha standartlash	Partiyalararo CV



Yuqori T da IE pasayishi	Fizik adsorbsiya desorbsiyasi	Sinergist yoki kimyoviy modifikatsiya	IE% 40–80°C
Mikrobiologik saqlanish	Suvli ekstrakt	Quruq konsentrat yoki konservatsiya	Shelf-life
Rang/hid	Tabiiy ekstrakt komponentlari	Tozalash/fraksiyalash	Sanoat jarayoniga moslik
Ko'p miqdor talab qilinishi	Faol modda past ulushi	Konsentrlash yoki sinergik formulatsiya	g/L va tannarx
Sanoat masshtabi	Laboratoriya → pilot farqi	Pilot loop va kupon sinovi	Korroziya tezligi mm/yil

3-jadval. Mahalliy yashil ingibitorlarni sanoatlashtirishdagi asosiy cheklovlar va yechimlar.

MUHOKAMA

Natijalar o'simlik ekstraktlari korroziya ingibitori sifatida yuqori potensialga ega ekanini ko'rsatadi, ammo laboratoriya IE% qiymatini bevosita sanoat samaradorligi deb qabul qilish noto'g'ri. Bir xil ekstrakt konsentratsiyasi turli kislota, temperatura, metall markasi va immersion vaqtida keskin farqli natija beradi.

Anor po'stlog'i, uzum urug'i va yong'oq po'stlog'ining yuqori samaradorligi ularning polifenol va tanninlarga boyligi bilan izohlanadi. Molekulalardagi fenolik –OH guruhlari, karbonil kislorodi va aromatik π -elektronlar metall sirtidagi faol markazlar bilan o'zaro ta'sirlashib, adsorbsion himoya qatlamini hosil qiladi.

Vegetal tanninlar mahalliy xomashyo strategiyasida alohida ahamiyatga ega. Ular ko'plab qishloq xo'jaligi qoldiqlaridan olinishi mumkin va temir ionlari bilan kompleks hosil qilish qobiliyatiga ega. Biroq ekstrakti to'g'ridan-to'g'ri ishlatish o'rniga tannin fraksiyasini standartlash uzoq muddatda sifat nazoratini yaxshilaydi. Lignin va lignosulfonat yo'nalishi ham istiqbollidir. Ligninning aromatik va fenolik tuzilishi adsorbsiyaga yordam beradi, biroq suvda eruvchanlik cheklovi uni kimyoviy modifikatsiya yoki lignosulfonat shaklida qo'llashni talab qilishi mumkin.



Harorat yashil ingibitorlarning zaif nuqtalaridan biridir. Ko'plab o'simlik ekstraktlarida temperatura oshishi bilan adsorbsion qatlamning desorbsiyasi kuchayib, IE% kamayadi. Shu sabab issiq kislotali pickling yoki neft-gaz quduqlarida to'g'ridan-to'g'ri foydalanishdan oldin termik barqarorlik majburiy tekshirilishi kerak.

Mahalliy lashtirishning iqtisodiy afzalligi faqat xomashyoning arzonligida emas. Agrochiqindini yig'ish, quritish, ekstraksiya, erituvchini regeneratsiya qilish, standartlash va saqlash xarajatlari ham umumiy tannarxga kiradi. Shuning uchun texnik-iqtisodiy baholash laboratoriya IE% bilan birga olib borilishi kerak.

Eng real sanoat modeli — bitta xom ekstraktga tayanish emas, balki standartlangan o'simlik fraksiyasi + xavfsiz sinergist + mos erituvchi/tashuvchi tizimdan iborat formulatsiya yaratishdir. Bu konsentratsiyani pasaytirishi, termik barqarorlikni oshirishi va partiyalararo farqni kamaytirishi mumkin.

Ushbu maqolaning cheklovi shundaki, O'zbekistonda aynan mahalliy navlardan olingan xomashyolar bo'yicha bir xil korrozion protokolda katta qiyosiy tajribalar yetarli emas. Shu sabab keyingi bosqichda mahalliy uzum urug'i, anor po'stlog'i va yong'oq po'stlog'ini bir xil 1 M HCl, bir xil po'lat markasi va bir xil temperatura sharoitida parallel sinash eng muhim eksperimental vazifa bo'ladi.

XULOSA

Mahalliy o'simlik va agro-sanoat xomashyolari korroziyaga qarshi ekologik xavfsiz moddalar ishlab chiqarish uchun istiqbolli resurs hisoblanadi. Uzum urug'i, anor po'stlog'i, yong'oq yashil po'stlog'i, tannin va ligninli chiqindilar polifenol va aromatik funksional guruhlari hisobiga metall sirtida himoya qatlam hosil qilishi mumkin.

Nashr etilgan tajribalarda anor po'stlog'i ekstrakti 95,8%, uzum urug'i taxminan 88%, yong'oq yashil po'stlog'i esa 82% gacha ingibirlash samaradorligini namoyish etgan. Biroq ushbu qiymatlar turli eksperimental sharoitlarda olinganligi sabab to'g'ridan-to'g'ri reyting sifatida qaralmasligi kerak.

Mahalliy sanoat uchun eng maqbul ilmiy yo'l — xomashyoni standartlash, suv/etanol ekstraksiyasini optimallashtirish, og'irlik yo'qotish + PDP + EIS orqali sinash, SEM/AFM bilan himoya qatlamini tasdiqlash va so'ng pilot sharoitda validatsiya qilishdir.

Kelajakdagi tadqiqotlarda mahalliy xomashyo ekstraktlarining termik barqarorligi, sinergik kombinatsiyalari, toksikologik profili, saqlanish muddati va texnik-



iqtisodiy samaradorligi bir vaqtning o'zida baholanishi kerak. Ana shunda yashil ingibitorlar sintetik import preparatlarining real alternativiga aylanishi mumkin.

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PCOS OR PCOD: ARE THEY REALLY THE SAME?

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Abstract

Few medical acronyms generate as much public confusion as PCOS and PCOD. Women searching for information about irregular periods, weight gain, acne, or difficulty conceiving routinely encounter both terms — sometimes in the same article, sometimes used interchangeably, and sometimes presented as two distinct diseases. This review article untangles the terminology. Drawing on international diagnostic guidelines and the clinical literature, it argues that PCOS (polycystic ovary syndrome) and PCOD (polycystic ovary disease or polycystic ovarian disease) refer to the same underlying condition, with the difference lying in convention and geography rather than biology. The article traces the history of both terms, explains the current diagnostic framework (the Rotterdam criteria), summarizes what is known about the hormonal and metabolic disturbances involved, outlines the condition's clinical features and long-term health implications, and surveys evidence-based approaches to management. It concludes that while the labels may differ from one clinic or country to another, the condition they describe is one — and clarity of language matters because clarity leads to better diagnosis, better treatment, and less fear.

Keywords: PCOS; PCOD; polycystic ovary syndrome; hyperandrogenism; insulin resistance; Rotterdam criteria

1. Introduction

Ask ten women what PCOS is and at least a few will mention PCOD in the same breath — often with the worried question of whether one is more serious than the other. The confusion is entirely understandable. Medical reports from one hospital may say "polycystic ovaries," a specialist may write "PCOS," a well-



meaning relative may speak of "PCOD problems," and the internet, as it so often does, amplifies the uncertainty until two words begin to sound like two diagnoses.

This article has a simple goal: to answer the question in its title clearly, and then to build a solid understanding of the condition behind both acronyms. The short answer, as the sections that follow will show, is that PCOS and PCOD are not different diseases. They are different names — used with different frequencies in different regions and eras — for the same complex endocrine disorder. Understanding why two names exist, and why one has become the international standard, is the first step toward understanding the condition itself.

2. PCOS and PCOD: Tracing the Two Terms

2.1 Where Each Term Comes From

The story begins in 1935, when American gynecologists Irving Stein and Michael Leventhal described a group of women with enlarged ovaries containing multiple small cysts, irregular or absent periods, and signs of excess male hormones. Their report gave rise to the name "Stein-Leventhal syndrome," which persisted for decades. As medical understanding deepened, it became clear that the small "cysts" on the ovaries are in fact immature follicles — eggs that began to develop but were never released — and that the condition extended far beyond the ovaries, involving metabolism, skin, and long-term health.

Out of this evolution came two parallel labels. "Polycystic ovarian disease," abbreviated PCOD, became common in parts of South Asia and in older British literature — the word "disease" reflecting an era when the condition was seen mainly as an ovarian abnormality. "Polycystic ovary syndrome," abbreviated PCOS, gradually became the preferred term internationally because it better captures reality: PCOS is a syndrome, meaning a recognizable pattern of signs and symptoms involving multiple body systems, not a single-organ disease confined to the ovaries.

2.2 How the Terms Are Used Today

In contemporary practice, the distinction is essentially geographic and generational rather than scientific. Table 1 summarizes the comparison.

Aspect	PCOS	PCOD
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Full form	Polycystic ovary syndrome	Polycystic ovarian disease (also written as polycystic ovary disorder)
Nature of term	Syndrome — a multisystem pattern	Disease/disorder — suggests a single-organ problem
Usage today	The international standard; used in WHO literature, research journals, and current guidelines	Largely regional (especially South Asia) and older literature; still common in everyday speech and some clinics
Diagnostic guidelines	Defined by the Rotterdam criteria (2003, revised 2023)	No separate guidelines exist under this name
Underlying condition	The same hormonal and metabolic disorder	Identical to PCOS

Table 1. PCOS versus PCOD: a comparison of terminology, not of diseases.

Notably, no major medical body recognizes PCOD as a separate diagnosis. The American College of Obstetricians and Gynecologists, the Endocrine Society, the World Health Organization, and the international evidence-based guideline for PCOS (most recently updated in 2023) all use the term PCOS. When a report says PCOD and another says PCOS, they are describing the same patient.

3. What the Condition Actually Is

3.1 The Hormonal Picture

Beneath the naming debate lies a genuinely complex endocrine disorder. At its core, PCOS involves a combination of hormonal disturbances. The ovaries produce higher-than-normal levels of androgens — the so-called "male hormones" that



women also make in small amounts. This hyperandrogenism drives many of the visible features of the condition: acne, excess hair growth on the face and body (hirsutism), and scalp hair thinning. At the same time, a large proportion of women with PCOS have insulin resistance, in which the body's cells respond poorly to insulin. The pancreas compensates by producing more insulin, and elevated insulin in turn stimulates the ovaries to produce even more androgens — a self-reinforcing cycle that links the hormonal and metabolic sides of the disorder. The classic ultrasound appearance — an ovary studded with many small follicles, often described as a "string of pearls" — is a consequence rather than a cause. Because ovulation is irregular or absent, follicles begin to mature each month but stall before releasing an egg, accumulating as small fluid-filled structures. Importantly, having polycystic-appearing ovaries on an ultrasound alone does not establish the diagnosis; many women without PCOS show this appearance, particularly adolescents, and the updated 2023 guideline has removed the ultrasound criterion for adults in some assessment pathways, emphasizing instead irregular ovulation and clinical or biochemical hyperandrogenism.



Figure 1. Transvaginal ultrasound image of a polycystic ovary, showing multiple small follicles arranged around the ovarian periphery.

3.2 Why It Develops

The precise origin of PCOS remains an active research question, but the evidence points to a combination of genetic predisposition and environmental triggers. PCOS



runs strongly in families: daughters and sisters of women with the condition have a substantially higher likelihood of developing it. Genome-wide studies have linked the condition to variants in genes involved in androgen production, insulin signaling, and ovarian function. On the environmental side, weight gain and diet appear to amplify the expression of the underlying predisposition — which helps explain why the condition can vary so much in severity between individuals, and why the same woman may experience very different symptoms at different stages of life.

4. Recognizing and Diagnosing PCOS

4.1 The Rotterdam Criteria

Internationally, diagnosis rests on the Rotterdam criteria, agreed in 2003 and reaffirmed in the 2023 international guideline. Under these criteria, a diagnosis requires at least two of three features, after excluding other conditions that can mimic PCOS (such as thyroid disorders, elevated prolactin, or non-classic congenital adrenal hyperplasia):

Criterion	How It Is Assessed	What It Reflects
Irregular or absent ovulation	Menstrual history — cycles persistently longer than ~35 days, fewer than ~8–9 periods per year, or absent periods	Disturbed ovarian cycle
Clinical or biochemical hyperandrogenism	Signs such as hirsutism, acne, hair thinning; or elevated androgen levels on blood tests	Excess male-hormone activity
Polycystic ovarian morphology on ultrasound	Elevated follicle count or enlarged ovarian volume on imaging	Accumulation of arrested follicles

Table 2. The three Rotterdam criteria: at least two of three are required for diagnosis, with other causes excluded.



4.2 The Clinical Spectrum

One of the most important — and most underappreciated — facts about PCOS is how varied it is. Some women meet every criterion and struggle with severe symptoms; others have only irregular periods and mildly elevated androgens; a significant minority have no visible symptoms at all and learn of the condition only when they have difficulty conceiving. Table 3 summarizes the common clinical features and their approximate frequency in affected women.

Feature	Approximate Frequency	Notes
Menstrual irregularity	Very common (often 70–80% or more)	Ranges from slightly long cycles to complete absence of periods
Hirsutism (excess hair growth)	Roughly 60–70%	Most noticeable on face, chest, abdomen; varies with ethnic background
Acne and oily skin	Common	Often persists beyond the teenage years
Scalp hair thinning	Common, especially with age	Pattern similar to male-pattern hair loss
Weight gain / central obesity	Present in a substantial subset, not all	Strongly linked to insulin resistance
Infertility or subfertility	A frequent presenting complaint	Usually related to infrequent ovulation; often responsive to treatment
Acanthosis nigricans	Seen in insulin-resistant cases	Dark, velvety skin patches, typically on the neck or underarms

Table 3. Common clinical features of PCOS and their approximate frequency. Frequencies vary between studies and populations.

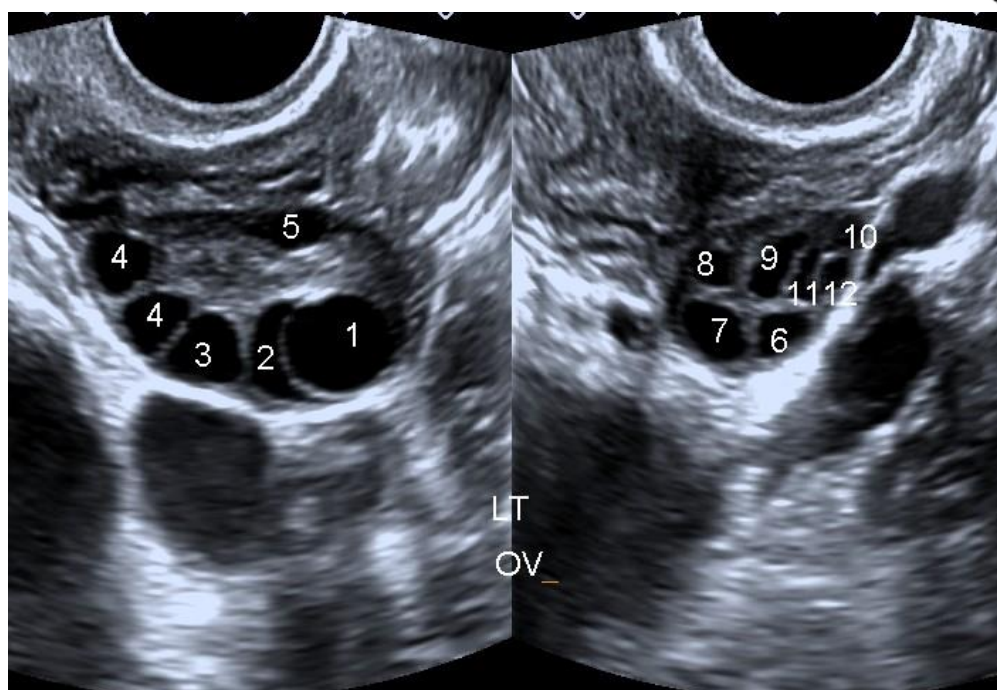


Figure 2. Ultrasound images of a polycystic left ovary with individually labeled follicles (Radiopaedia case).

5. Beyond the Ovaries: Long-Term Health Implications

Part of the reason the word "syndrome" won out over "disease" is that PCOS reaches well beyond reproductive health. The metabolic dimension is the most consequential: women with PCOS — particularly those who are overweight — have a substantially elevated risk of developing type 2 diabetes, and screening for glucose intolerance is a standard part of long-term care. Cardiovascular risk factors, including unfavorable cholesterol profiles and elevated blood pressure, are also more common, although the degree to which PCOS independently raises heart attack and stroke risk is still being clarified.

Reproductive implications extend in both directions. On one side, infrequent ovulation can make conception difficult; on the other, PCOS is one of the most common — and most treatable — causes of subfertility, responding well to lifestyle change and, when needed, medications that stimulate ovulation. During pregnancy, women with PCOS face somewhat higher risks of gestational diabetes and pregnancy-induced hypertension, which is why preconception care matters. Emerging evidence also links PCOS to a higher prevalence of sleep disturbances, mood disorders such as anxiety and depression, and reduced quality of life — a reminder that the burden of the condition is not only physical. Endometrial protection is another long-term consideration: when periods are very infrequent, the



uterine lining can be exposed to estrogen without the regular shedding that menstruation provides, slightly raising the risk of endometrial overgrowth, which is why inducing a withdrawal bleed several times a year is recommended in appropriate cases.

6. Managing PCOS: What Actually Works

There is no single cure for PCOS, but the honest truth is more hopeful than the word "chronic" often sounds: nearly every feature of the condition can be substantially improved, and many women achieve regular cycles, clear skin, and successful pregnancies with appropriate care. Management is built around the individual's priorities — symptom control, metabolic health, or fertility — because the treatment that serves one goal may differ from the treatment that serves another.

For most women, the foundation is lifestyle. Even a modest, sustained weight reduction of five to ten percent of body weight can restore ovulation in a meaningful proportion of overweight women with PCOS, improve insulin sensitivity, and reduce androgen levels. Exercise, independent of weight loss, also improves metabolic markers. Combined hormonal contraceptives remain the mainstay for cycle regulation and androgen suppression in women who are not seeking pregnancy, while anti-androgen medications may be added for hirsutism and hair thinning under medical supervision. Metformin, an insulin-sensitizing drug, has an established role in selected patients, particularly those with impaired glucose tolerance or when lifestyle measures alone are insufficient. For women trying to conceive, letrozole is now generally the first-line ovulation-inducing agent, supported by strong trial evidence. Crucially, the evidence cautions against a sprawling market of unproven supplements and "PCOS cures"; women are best served by care grounded in the international guidelines.

7. Dispelling Common Myths

Misinformation around PCOS and PCOD thrives in the same confusion that this article set out to address, so a brief corrective is warranted. First: polycystic ovaries are not ovaries full of dangerous cysts — the structures seen on ultrasound are immature follicles, and they are not the type of cysts that typically rupture or require surgery. Second: PCOS is not caused by something a woman did or failed to do; while lifestyle influences its expression, the predisposition is largely genetic. Third: not every woman with PCOS is overweight; lean PCOS is well recognized, though the metabolic risks may be more easily overlooked. Fourth: PCOS does not mean a



woman cannot have children — it means conception may take longer and benefit from medical support. Finally, and most relevant to this review: PCOD is not the "mild" cousin of a "severe" PCOS. There is one condition, and its severity varies from person to person, not from acronym to acronym.

8. Conclusion

So, are PCOS and PCOD really the same? Yes — completely. The two abbreviations emerged from different eras and different regional habits of medical language, but they describe a single, well-characterized endocrine disorder: a syndrome of ovarian dysfunction, hyperandrogenism, and metabolic disturbance, diagnosed by the Rotterdam criteria and managed according to international evidence-based guidelines. PCOS is simply the term the global medical community has settled on, and the shift from "disease" to "syndrome" is itself instructive — it reflects how far understanding has come from the days when the condition was imagined as a problem of the ovaries alone.

Why does the distinction matter at all? Because language shapes care. A woman told she has "PCOD" and another told she has "PCOS" deserve to know they share the same condition, the same evidence base, and the same hopeful outlook. What matters clinically is not the acronym on the report but the individual in front of the clinician: her symptoms, her metabolic profile, her priorities, and her plans. With accurate diagnosis, lifestyle foundations, and guideline-based treatment, the great majority of women with this condition — whatever it is called — can expect to live full, healthy, and fertile lives.

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THE GUT–BRAIN CONNECTION: WHERE NUTRITION MEETS NEUROSCIENCE

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1. An Uneasy Feeling in the Stomach

You've felt it before. The flutter of nerves before a big presentation. The knot in your stomach when you receive bad news. For most of human history, we treated these sensations as poetic curiosities — the gut somehow 'knowing' what the mind refuses to admit. Ancient writers spoke of bowels of compassion and burning courage. It turns out they were onto something far more literal than they could have imagined. Today, one of the most exciting frontiers in medicine sits at the unlikely intersection of two disciplines that barely spoke a generation ago: nutrition and neuroscience. Researchers now understand that the gut and the brain are in constant, two-way conversation — a dialogue carried out through nerves, hormones, immune signals, and an astonishingly busy community of microbes that call our intestines home. The conversation is so lively that scientists have started calling the gut our 'second brain.' This article traces that conversation from the anatomy that makes it possible to the dinner-table choices that shape it. Along the way, we will meet the vagus nerve — the body's information superhighway — a hundred trillion microbial passengers, and the emerging science of 'psychobiotics': the idea that what we feed our gut may one day help feed our minds.

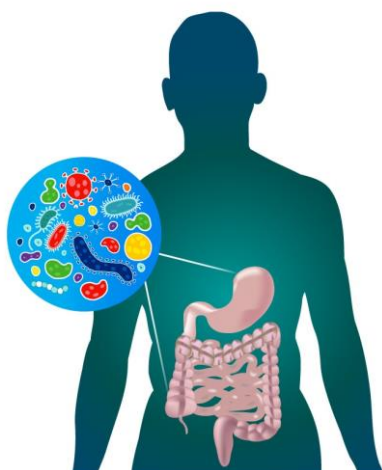


Figure 1. The human gut hosts trillions of microorganisms that influence digestion, immunity, and even mood.

2. Two Organs, One Constant Conversation

At first glance, the brain and the gut could hardly be more different. One sits in the skull, generating thoughts and dreams; the other is a long, muscular tube, mostly ignored unless it complains. Yet both develop from the same embryonic tissue in the earliest weeks of life, and both are dense with neurons — the gut alone contains an estimated 500 million of them, organized into the enteric nervous system.

The enteric nervous system is no mere relay station waiting for orders from the brain. It can function largely on its own, coordinating digestion, enzyme release, and muscle contraction. But it is also wired — quite literally — into the central nervous system. The main cable of that wiring is the vagus nerve, the longest cranial nerve in the body, running from the brainstem down through the heart, lungs, and digestive tract.

Think of the vagus nerve as a busy telephone line with traffic flowing in both directions, and the gut placing far more calls than the brain. An estimated 80 to 90 percent of its fibers carry information upward, from gut to brain. A troubled gut does not stay quiet — it calls headquarters, and headquarters listens.

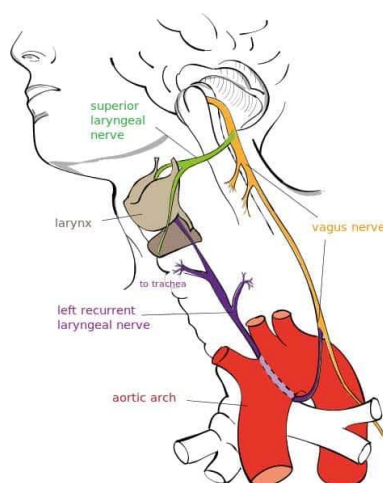


Figure 2. The vagus nerve (cranial nerve X) — the principal communication line between brain and gut.

The dialogue does not rely on wires alone. The gut and brain also speak through chemistry. Around 90 percent of the body's serotonin — the neurotransmitter famously linked to mood — is produced in the digestive tract, where it helps regulate gut movement and sensation. GABA, the brain's principal calming signal, is likewise manufactured with microbial assistance. The immune system adds its own channel: roughly 70 percent of the body's immune tissue resides in the gut, and inflammatory signals from this border region can travel through the bloodstream and influence the brain.

Table 1. Chemical messengers at the gut–brain interface

Messenger	Where it comes from	What it does
Serotonin	Mostly made in the gut; some by microbes	Regulates gut motility, appetite, and mood
GABA	Gut microbes (Lactobacillus, Bifidobacterium)	Calms neural activity; eases anxiety signals
Dopamine	Gut microbes and gut cells contribute supply	Motivation, reward, and pleasure pathways
Short-chain fatty acids	Microbial fermentation of dietary fiber	Nourish gut lining; modulate inflammation
Cytokines	Immune cells in gut lymphoid tissue	Inflammatory signals that alter brain function



Cortisol	Adrenal glands, via the HPA stress axis	Stress hormone that reshapes the gut environment
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Synthesized from current reviews in neurogastroenterology and microbiome research.

3. A Microbial Metropolis

Now to the most surprising residents of this story: the microbes. The average human colon hosts trillions of bacteria, viruses, fungi, and other microscopic organisms — collectively weighing around two kilograms and carrying more genetic material than our own genome. These are not freeloaders. They break down the fiber we cannot digest, synthesize vitamins, train our immune system, and defend the gut lining against intruders. In return, we provide them room and board.

But their tenancy agreement includes clauses we are only beginning to read. Certain gut bacteria produce neuroactive compounds that can slip into the bloodstream or tickle the vagus nerve. Others influence the integrity of the gut wall — a critical barrier, because when that wall becomes leaky, inflammatory molecules can cross into circulation and reach the brain. People with depression, anxiety, and several other conditions often show measurably different microbial communities than healthy controls. The correlation is too consistent to ignore.

Perhaps the most striking illustration comes from animal studies. Transplant gut microbes from anxious mice into calm mice and the recipients begin to behave anxiously — and vice versa. Germ-free mice, raised entirely without microbes, show altered stress responses that partially normalize once they are colonized. Mice are not humans, and caution is warranted, yet the experiments established something profound: microbes can shape behavior.

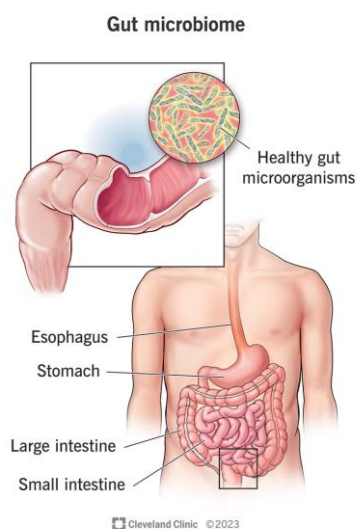


Figure 3. A healthy gut microbiome: diverse microbes line the intestine and support digestion, immunity, and signaling.

4. Where Nutrition Enters the Story

If microbes are the messengers, then food is the message. Every meal is an instruction set for this microbial metropolis — favoring some species, starving others, and quietly rearranging the chemistry of the entire system. This is where nutrition stops being a question of calories and becomes a question of information. Consider dietary fiber, the humble carbohydrate our own enzymes cannot digest. To us, it is roughage; to our microbes, it is a feast. Fiber-hungry bacteria ferment it into short-chain fatty acids such as butyrate — the gut lining's favorite food, keeping the barrier tight — and these fatty acids also dial down inflammation and influence appetite hormones. Populations eating fiber-rich traditional diets consistently show more diverse gut microbiomes than those on typical Western fare.

Then there are fermented foods — yogurt, kefir, kimchi, sauerkraut, miso — which deliver living microbes directly. In a notable Stanford study, volunteers who added six servings of fermented foods daily saw increases in gut microbial diversity and, intriguingly, decreases in several markers of inflammation. Polyphenol-rich foods like berries, dark chocolate, green tea, and olive oil act as fuel for beneficial species, while omega-3 fats from fatty fish appear to support both microbial balance and the brain's own structure.

The Western dietary pattern — high in ultra-processed foods and added sugars, low in fiber — tells a different story. It is associated with reduced microbial diversity, a weakened gut barrier, and low-grade systemic inflammation. It is telling that this same pattern is independently linked to higher rates of depression and cognitive



decline. The fork, it seems, may be one of the most underrated medical instruments we own.



Figure 4. Fermented foods such as yogurt, kimchi, sauerkraut, and kefir supply live microbes that may support gut–brain health.

Table 2. Feeding the gut–brain axis: a practical menu

Food group	Key players	Proposed brain benefit
Fermented foods	Yogurt, kefir, kimchi, sauerkraut, miso	Live microbes may boost diversity, calm inflammation
Fiber-rich plants	Beans, lentils, whole grains, vegetables	Fuel butyrate production; strengthen the gut barrier
Polyphenol sources	Berries, dark chocolate, green tea, olive oil	Nourish beneficial bacteria; antioxidant effects
Omega-3 fats	Fatty fish, walnuts, flaxseed	Support neuronal membranes; reduce inflammation
Prebiotic foods	Garlic, onions, leeks, asparagus, bananas	Selectively feed helpful microbial species
Limit / minimize	Ultra-processed foods, excess added sugar	Linked to lower diversity and higher inflammation

General guidance synthesized from nutritional psychiatry and microbiome research; individual needs vary.

5. From the Clinic to the Kitchen Table

What does all this mean for someone suffering from depression, chronic anxiety, or a stress-ravaged digestive system? The honest answer is: promising, but still



unfolding. The famous SMILES trial in Australia demonstrated that a structured Mediterranean-style dietary program could significantly reduce depressive symptoms — the first major randomized evidence that diet itself could be a treatment lever.

Psychobiotics — probiotics or prebiotics with documented mental-health effects — represent the next frontier. Certain strains have shown modest benefits in reducing anxiety and stress responses in small human trials. Meanwhile, therapists treating irritable bowel syndrome, a condition long dismissed as 'all in the head,' now use gut-directed hypnotherapy and cognitive behavioral therapy with solid success — proof that working on the brain can heal the gut, just as feeding the gut may soothe the brain.

Table 3. Snapshot: conditions with emerging gut–brain links

Condition	Observed gut-related findings	Status of evidence
Depression	Altered microbial composition; low-grade inflammation	Moderate; human trials ongoing
Anxiety disorders	Heightened gut permeability; vagus signaling changes	Emerging; animal + small human studies
Irritable bowel syndrome	Microbial shifts; hypersensitive gut–brain signaling	Established bidirectional link
Autism spectrum	Distinct microbiome signatures; GI symptoms common	Preliminary; actively researched
Neurodegenerative disease	Early gut microbial changes precede symptoms	Early-stage; hypothesis-generating
Stress-related disorders	HPA-axis and microbiome disruption	Moderate; stress clearly alters microbiome

Synthesized from peer-reviewed literature; links are correlational or early-interventional, not yet clinical standard.

6. Listening to Your Gut — Literally



For all its complexity, the practical wisdom of the gut–brain axis is disarmingly simple. Eat a wide variety of plants. Let fermented foods share your table. Keep ultra-processing to a minimum. Move your body, sleep well, and manage stress — all of which shape the microbiome as surely as food does. And if you live with persistent gut or mood symptoms, mention both to your doctor, because treating one without the other increasingly looks like a missed opportunity.

There is also a quieter lesson here about humility. For a century, neuroscience treated the brain as a sovereign, sealed inside the skull. The gut–brain revolution reminds us that the body is an ecosystem — interconnected, dialogic, and far more collaborative than we assumed. The microbes in your colon are not passengers; they are participants in the making of your mood, your resilience, and perhaps even your personality. The next time you feel butterflies before a big moment, take it as what it literally is: your second brain, calling your first, reminding you that you are one integrated whole.

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**VERBAL EXPRESSION OF MORAL CONCEPTS IN
ALISHER NAVOI'S *HAYRAT UL-ABROR* AND GEOFFREY
CHAUCER'S *THE CANTERBURY TALES*: A
COMPARATIVE STUDY OF UZBEK AND ENGLISH
LANGUAGES**

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Annotatsiya

Ushbu maqolada Alisher Navoiyning *Hayrat ul-Abror* asari va Geoffrey Chaucerning *The Canterbury Tales* asarida axloqiy tushunchalarning verbal ifodalanishi qiyosiy-lingvistik jihatdan tadqiq etiladi. Tadqiqotda adolat, halollik, saxovat, bilim, kamtarlik, rahm-shafqat, ochko'zlik, manmanlik, yolg'on va ikkiyuzlamachilik kabi axloqiy tushunchalarning ikki xil adabiy va lingvomadaniy muhitda ifodalanish xususiyatlari tahlil qilinadi. Navoiyning asarida axloqiy tushunchalar asosan falsafiy-didaktik bayon, metafora, ramziylik, leksik takror va semantik qarama-qarshiliklar orqali ifodalandani aniqlanadi. Chaucer ijodida esa mazkur tushunchalar ko'proq obrazlar xarakteri, dialog, kinoya, hikoya voqealari va pragmatik ma'no orqali namoyon bo'ladi. Tadqiqot natijalari har ikki asarda umumiy axloqiy qadriyatlar mavjudligini, biroq ularning verbal ifodasi tegishli tarixiy, diniy, madaniy va lingvistik an'analar ta'sirida shakllanganini ko'rsatadi. Maqola o'zbek va ingliz tillarida axloqiy konseptlarning ifodalanishidagi o'xshash va farqli jihatlarni aniqlashga xizmat qiladi.

Kalit so'zlar: Alisher Navoiy, *Hayrat ul-Abror*, Geoffrey Chaucer, *The Canterbury Tales*, axloqiy konseptlar, axloqiy tushunchalar, verbal ifoda, qiyosiy tilshunoslik, o'zbek tili, ingliz tili, lingvomadaniyat, metafora, kinoya, adolat, halollik, saxovat, bilim, kamtarlik.

Abstract



This article presents a comparative linguistic study of the verbal expression of moral concepts in Alisher Navoi's *Hayrat ul-Abror* and Geoffrey Chaucer's *The Canterbury Tales*. The study examines the ways in which such moral concepts as justice, honesty, generosity, knowledge, humility, compassion, greed, pride, deception, and hypocrisy are represented within two different literary and linguocultural traditions. The analysis demonstrates that moral concepts in Navoi's work are primarily expressed through philosophical and didactic discourse, metaphors, symbolism, lexical repetition, and semantic contrasts. In Chaucer's work, these concepts are more frequently conveyed through characterization, dialogue, irony, narrative situations, and pragmatic meaning. The findings indicate that both literary works reflect a number of universal moral values, while their verbal representation is shaped by distinct historical, religious, cultural, and linguistic traditions. The study contributes to a better understanding of the similarities and differences in the verbalization of moral concepts in Uzbek and English literary traditions and highlights the close relationship between language, culture, literature, and moral worldview.

Key words: Alisher Navoi, *Hayrat ul-Abror*, Geoffrey Chaucer, *The Canterbury Tales*, moral concepts, moral values, verbal expression, comparative linguistics, Uzbek language, English language, linguoculture, metaphor, irony, justice, honesty, generosity, knowledge, humility.

Аннотация

В данной статье проводится сравнительно-лингвистическое исследование вербализации нравственных концептов в произведении Алишера Навои «*Хайрат ул-Аброр*» и произведении Джеффри Чосера *The Canterbury Tales*. В исследовании рассматриваются особенности языкового выражения таких нравственных понятий, как справедливость, честность, щедрость, знание, скромность, сострадание, жадность, гордость, обман и лицемерие в двух различных литературных и лингвокультурных традициях. Установлено, что в произведении Навои нравственные концепты преимущественно выражаются посредством философско-дидактического изложения, метафор, символических образов, лексических повторов и семантических противопоставлений. В произведении Чосера эти концепты чаще раскрываются через характеристику персонажей, диалоги, иронию,



сюжетные ситуации и прагматические значения. Результаты исследования показывают, что оба произведения отражают универсальные нравственные ценности, однако способы их языковой репрезентации формируются под влиянием различных исторических, религиозных, культурных и языковых традиций. Исследование способствует выявлению сходств и различий в вербализации нравственных концептов в узбекской и английской литературных традициях.

Ключевые слова: Алишер Навои, «*Хайрат ул-Аброр*», Джеффри Чосер, *The Canterbury Tales*, нравственные концепты, нравственные понятия, вербальная репрезентация, сравнительное языкознание, узбекский язык, английский язык, лингвокультура, метафора, ирония, справедливость, честность, щедрость, знание, скромность.

INTRODUCTION

Literature is one of the most important means through which societies express, preserve, and transmit their moral values. Literary works not only entertain readers but also reflect cultural ideas about good and evil, justice and injustice, honesty and dishonesty, compassion and cruelty, knowledge and ignorance, generosity and greed. Moral concepts are particularly significant because they are closely connected with the worldview, traditions, religious beliefs, and social values of a particular community. Although different cultures may use different linguistic forms to express these concepts, many fundamental moral ideas demonstrate remarkable similarities. This can be clearly observed when comparing Alisher Navoi's *Hayrat ul Abror* and Geoffrey Chaucer's *The Canterbury Tales*, two major works of medieval literature belonging to different linguistic and cultural traditions.

Alisher Navoi and Geoffrey Chaucer occupy central positions in the literary histories of Uzbek and English cultures respectively. Navoi is regarded as one of the greatest representatives of classical Chagatai literature and played an exceptional role in demonstrating the expressive possibilities of the Turkic language. Chaucer, meanwhile, is widely regarded as one of the foundational figures of English literature, particularly for his contribution to the development of literary English. Despite the considerable geographical, linguistic, religious, and cultural distance between them, both writers devoted substantial attention to human behavior and



moral questions. Their works portray people from different social backgrounds and examine their virtues, weaknesses, ambitions, relationships, and responsibilities.

Hayrat ul Abror, the first poem of Navoi's *Khamsa*, is fundamentally concerned with ethical and philosophical questions.

The work presents reflections on justice, morality, knowledge, humility, generosity, human dignity, social responsibility, and spiritual perfection. Navoi frequently expresses moral concepts through aphoristic statements, metaphors, comparisons, religious terminology, didactic narratives, and descriptions of exemplary or negative behavior. His language is highly symbolic and philosophical, and moral ideas are often presented as universal principles that should guide human life.

The Canterbury Tales, on the other hand, employs a more varied narrative structure. Chaucer presents a group of pilgrims traveling to Canterbury, each of whom tells one or more stories. Through these tales and through the descriptions of the pilgrims themselves, Chaucer explores a wide range of moral concepts, including honesty, hypocrisy, greed, generosity, fidelity, deception, justice, forgiveness, pride, and social responsibility. Chaucer's treatment of morality is frequently indirect and dramatic. Rather than simply stating a moral principle, he often allows characters, events, irony, humor, and narrative consequences to reveal the moral dimension of human behavior.

The comparison of these works from a linguistic perspective is particularly valuable because moral concepts are not expressed only through abstract vocabulary. They are also encoded in grammatical structures, lexical choices, metaphors, idiomatic expressions, speech patterns, forms of address, proverbs, repetitions, contrasts, and narrative strategies. Therefore, the comparison of *Hayrat ul Abror* and *The Canterbury Tales* makes it possible to examine how Uzbek literary tradition and English literary tradition verbalize similar moral ideas through different linguistic and cultural systems.

LITERATURE REVIEW AND METHODOLOGY

Moral Concepts as Linguistic and Cultural Phenomena

A moral concept can be understood as an abstract idea concerning what a society considers right or wrong, desirable or undesirable, honorable or shameful. Concepts such as justice, honesty, kindness, generosity, patience, wisdom, humility,



loyalty, greed, envy, pride, and hypocrisy exist in many cultures, but their verbal expression differs according to the linguistic resources and cultural traditions of each community.

Language provides speakers and writers with different ways of conceptualizing moral experience. A moral quality may be expressed through a noun, adjective, verb, metaphorical expression, proverb, comparison, or an entire narrative episode. For example, the concept of generosity may be represented by words referring to giving, charity, kindness, open-handedness, or selflessness. However, the semantic and emotional associations of these words depend upon cultural context.

In classical Uzbek literature, moral concepts are frequently associated with Islamic ethics, Sufi philosophy, classical Persian literary traditions, and the social ideals of the medieval East. Concepts such as *adolat* (justice), *ilm* (knowledge), *sabr* (patience), *saxovat* (generosity), *tavoze* (humility), *halollik* (honesty), and *muruvvat* (benevolence) have significant ethical and spiritual dimensions. Their meanings may extend beyond ordinary social behavior and become associated with the individual's relationship with God, society, knowledge, and the human soul.

In Chaucer's literary world, moral concepts are influenced by Christian ethics, medieval European social structures, classical literary traditions, and contemporary English society. Words and expressions associated with *virtue*, *sin*, *charity*, *truth*, *honor*, *greed*, *pride*, *lust*, and *deception* often carry both religious and social meanings. Chaucer's characters demonstrate these concepts through their actions and interactions, frequently producing a contrast between what people claim to be and what they actually do.

Thus, although the linguistic forms differ, both authors use language to examine the relationship between moral ideals and real human behavior.

Moral Vocabulary in *Hayrat ul Abror*

The title *Hayrat ul Abror* itself reflects the ethical orientation of the work. The expression can be interpreted as referring to the astonishment or wonder associated with righteous and virtuous people. From the beginning, the poem establishes a moral and philosophical framework in which human beings are encouraged to seek spiritual and ethical perfection.

Navoi's moral vocabulary includes concepts connected with justice, wisdom, knowledge, generosity, humility, honesty, compassion, and responsibility. These concepts are often presented through elevated literary language. Moral nouns and



abstract concepts are especially important because they allow Navoi to discuss ethical principles as universal categories.

The concept of justice is particularly significant in Navoi's worldview. Justice is not presented simply as an individual virtue but also as a principle necessary for the proper organization of society. The ruler, the scholar, and the ordinary person all have moral responsibilities. Through lexical repetition and semantic contrasts, Navoi establishes relationships between justice and oppression, knowledge and ignorance, generosity and greed, humility and arrogance.

One important characteristic of Navoi's moral language is the frequent use of oppositional structures. Good and evil, light and darkness, knowledge and ignorance, justice and oppression, generosity and greed are placed in semantic opposition. Such contrasts make abstract moral concepts easier to understand and give the text a strong didactic quality.

Metaphorical language is another important means of verbalizing morality. Navoi frequently conceptualizes spiritual and moral states through images drawn from nature, religion, light, darkness, travel, wealth, and human relationships. In this way, an abstract moral quality becomes a concrete image in the reader's imagination.

Navoi also uses advice, reflection, narrative examples, and aphoristic statements. His moral statements often have a generalizing character, transforming individual observations into broader principles about human existence. The reader is not merely invited to observe characters but encouraged to evaluate human behavior according to a clearly established ethical framework.

Moral Concepts in *The Canterbury Tales*

Chaucer approaches morality through a markedly different narrative strategy. Instead of constructing a single continuous didactic poem, he creates a collection of stories told by pilgrims representing different occupations, social positions, personalities, and moral perspectives. This diversity enables Chaucer to examine morality from multiple angles. The General Prologue introduces characters whose physical appearance, profession, behavior, and social reputation frequently reveal moral contradictions. Some characters appear respectable but behave dishonestly, while others have socially questionable occupations yet display positive personal qualities. This contrast between appearance and reality is one of the most important mechanisms through which Chaucer expresses moral concepts. The concept of hypocrisy is particularly prominent. Certain characters publicly represent



themselves as respectable, religious, or virtuous, while their actions reveal greed, vanity, deception, or self-interest. Chaucer frequently uses irony to expose this discrepancy. The language of praise may therefore contain an implicit criticism.

Greed is another recurring moral concept. Characters may be motivated by money, social status, personal pleasure, or material advantage. Through dialogue and narrative events, Chaucer demonstrates how excessive attachment to material wealth can distort relationships and moral judgment.

Chaucer also explores concepts such as fidelity and marriage. Different tales present contrasting perspectives on love, marriage, sexual morality, power, and trust. Rather than providing a single simple answer, Chaucer allows different characters to express conflicting viewpoints. This makes his representation of morality dialogic and multifaceted.

Religious morality is also important. Some characters genuinely embody religious ideals, while others exploit religion for personal benefit. The contrast between sincere faith and religious hypocrisy becomes an important source of both moral criticism and irony.

Justice and Injustice in the Two Works

Justice represents one of the most significant points of comparison between Navoi and Chaucer. In *Hayrat ul Abror*, justice is strongly connected with social order and ethical governance. Navoi's treatment of justice reflects the idea that rulers and individuals must act responsibly and avoid oppression. Justice is therefore both a personal virtue and a social principle.

In *The Canterbury Tales*, justice appears in different forms depending on the tale and its characters. It may be connected with law, punishment, social relationships, marriage, revenge, or divine judgment. Chaucer's narratives sometimes reveal the limitations of human justice and emphasize the complexity of moral situations. The linguistic realization of justice also differs. Navoi tends to use abstract moral vocabulary and philosophical statements, whereas Chaucer frequently dramatizes justice through characters and events. In Navoi, the reader may encounter an explicit statement about the importance of justice. In Chaucer, the reader may instead observe a conflict in which an individual's behavior produces consequences that raise questions about justice. This distinction demonstrates an important difference between the two authors' methods. Navoi often moves from a particular example



toward a universal moral principle, while Chaucer frequently moves from a particular story toward an ambiguous or multifaceted moral interpretation.

Generosity and Greed

Generosity and greed form another important semantic opposition. In Navoi's ethical system, generosity is closely associated with human dignity and spiritual excellence. The generous person is represented as someone who contributes to society and demonstrates moral strength. Greed, by contrast, limits the individual and represents excessive attachment to material possessions. The linguistic representation of generosity in classical Uzbek literature frequently involves concepts of giving, sharing, hospitality, charity, kindness, and open-heartedness. Such vocabulary reflects the cultural importance of communal responsibility and generosity toward others.

Chaucer also repeatedly examines generosity and greed. His characters may give money for religious purposes, seek wealth through commerce, manipulate others for financial gain, or use religious authority to acquire material benefits. The contrast between genuine generosity and self-interested giving becomes an important source of irony.

One particularly significant difference is the manner in which the two authors present these concepts. Navoi generally establishes generosity as a positive moral ideal within a clearly defined ethical worldview. Chaucer often allows the reader to discover the moral contradiction through narrative context. The same action may appear virtuous on the surface but become questionable when the character's motivation is revealed.

Knowledge and Ignorance

Knowledge is central to Navoi's understanding of human perfection. The concept of *ilm* occupies an important position in classical Islamic and Central Asian intellectual culture. Knowledge is associated with wisdom, moral development, spiritual awareness, and the proper use of human abilities. Ignorance is not simply the absence of information; it can also represent moral and spiritual deficiency.

Navoi's language frequently creates semantic relationships between knowledge, wisdom, reason, and virtue. The educated and wise person is presented as someone capable of recognizing moral truth and controlling undesirable desires.



In Chaucer's work, knowledge is also connected with authority and social status, but its representation is frequently ironic. Characters may possess professional knowledge yet lack moral wisdom. Others may claim knowledge or authority without genuinely possessing the qualities they profess. This creates a distinction between technical knowledge and moral understanding.

The linguistic contrast between knowledge and ignorance therefore operates differently in the two works. Navoi tends to establish knowledge as an explicit ethical value, whereas Chaucer frequently explores the gap between knowledge, authority, and actual behavior.

Humility and Pride

Humility and pride constitute another significant moral opposition. Navoi's moral philosophy places considerable emphasis on humility. Excessive pride is presented as a barrier to spiritual development because it separates the individual from other people and encourages self-admiration.

The linguistic expression of humility may involve words and phrases associated with modesty, submission, respect, and recognition of one's limitations. Pride, by contrast, is associated with arrogance, self-importance, social superiority, and excessive attachment to status.

Chaucer also presents pride as a significant human weakness. Characters may boast about their wealth, beauty, education, profession, social position, or sexual experiences. Chaucer's irony becomes especially effective when a character's own speech unintentionally exposes the very moral weakness that the character is attempting to conceal.

This difference illustrates the importance of narrative voice. Navoi's narrator frequently guides the reader toward an ethical interpretation, while Chaucer often creates a distance between the narrator, the character, and the reader. The reader must sometimes interpret the moral significance independently.

Honesty, Deception, and Hypocrisy

Honesty is another universal moral concept represented in both literary traditions. In *Hayrat ul Abror*, truthfulness is associated with moral integrity and spiritual purity. Dishonesty damages relationships and distances the individual from ethical perfection.



Chaucer's world is particularly rich in representations of deception. Characters deceive one another for economic, romantic, social, or personal reasons. Some forms of deception are openly condemned, while others are presented humorously or ambiguously. This creates a complex moral landscape.

The linguistic expression of deception in *The Canterbury Tales* often depends on dialogue. A character's words may conceal the truth, manipulate another person, or construct a false image of reality. Speech itself becomes a moral instrument. The ability to speak persuasively can be used either for legitimate communication or for manipulation.

In Navoi's work, moral language tends to emphasize the distinction between truth and falsehood as ethical categories. In Chaucer, the distinction may become more complicated because the act of storytelling itself is foregrounded. Characters are storytellers, and storytelling can reveal, conceal, entertain, persuade, or deceive.

Religious and Spiritual Dimensions

Religion plays a central role in both works, although the literary manifestations of religious thought differ. Navoi's *Hayrat ul Abror* is deeply connected with Islamic moral and spiritual concepts. Ethical behavior is often presented as part of the individual's spiritual journey. Human virtues are not merely socially useful qualities; they are connected with spiritual purification and closeness to divine truth.

Chaucer writes within a Christian medieval society, and religious concepts appear throughout *The Canterbury Tales*. Pilgrimage itself provides a religious framework for the narrative. At the same time, Chaucer examines the difference between religious ideals and the behavior of religious representatives.

This difference is especially visible in the treatment of religious figures. Navoi's moral discourse often presents an idealized ethical model grounded in spiritual principles, whereas Chaucer frequently exposes contradictions within religious institutions and individuals. His use of irony allows him to criticize hypocrisy without necessarily rejecting the religious ideals themselves. From a linguistic perspective, both works use religious vocabulary to establish moral authority. However, the surrounding narrative functions differ. In Navoi, religious and ethical vocabulary often supports direct philosophical instruction. In Chaucer, religious vocabulary may become part of characterization and satire.



Metaphor and Symbolism

Metaphor is one of the most powerful linguistic devices used to express moral concepts. Abstract ideas such as virtue, sin, knowledge, and ignorance are difficult to represent directly. Writers therefore transform them into concrete images.

Navoi's poetry makes extensive use of symbolic imagery. Light can be associated with knowledge or spiritual truth, while darkness may suggest ignorance or moral failure. The journey can represent spiritual development, and images of wealth may represent either generosity or attachment to worldly possessions.

Chaucer's symbolism is more closely integrated with narrative situations. Objects, professions, clothing, physical appearance, and social practices can acquire moral significance. A character's clothing may reveal social aspirations, while professional tools may symbolize economic interests or personal identity.

The difference reflects the genres and literary traditions of the two works. Navoi's poem belongs to a highly developed tradition of didactic and philosophical poetry, while Chaucer's work combines narrative, satire, comedy, romance, exemplum, and social observation.

Lexical and Stylistic Differences Between Uzbek and English

A linguistic comparison of the two works must consider the historical forms of the languages involved. Navoi wrote in Chagatai Turkic, the classical literary language that became highly influential in Central Asian literature. Chaucer wrote in Middle English, an important stage in the historical development of modern English.

Both literary languages possessed rich systems of borrowing. Navoi's vocabulary reflects Turkic elements alongside substantial Persian and Arabic influence. Many moral and philosophical terms in classical literature have Persian or Arabic origins, particularly in religious and intellectual discourse. Chaucer's English likewise contains substantial French and Latin influence, especially in areas connected with religion, administration, law, philosophy, and social hierarchy.

Consequently, moral concepts in the two texts may be represented through layers of vocabulary associated with different cultural traditions. The lexical history of a word can itself provide information about the intellectual environment in which a moral concept developed.



The grammatical structures of the languages also influence expression. Chagatai is an agglutinative Turkic language, meaning that grammatical information can be expressed through suffixation. English, by contrast, relies more heavily on word order, auxiliary verbs, prepositions, and relatively limited inflection. These structural differences can affect the way relationships between concepts are expressed.

The poetic structure of Navoi's work also allows repetition, parallelism, rhyme, and rhythmic organization to reinforce moral statements. Chaucer's verse similarly employs rhyme and meter, but his narrative style allows extended dialogue and characterization to play a major role.

Proverbs, Aphorisms, and Moral Generalizations

Proverbs and aphoristic expressions are important mechanisms for expressing cultural knowledge. A proverb compresses a complex social or moral principle into a relatively short linguistic form. Such expressions are memorable because they use rhythm, repetition, metaphor, contrast, and culturally familiar imagery.

Navoi's moral discourse frequently resembles proverbial wisdom. His statements about human behavior can often be interpreted as general principles that extend beyond the immediate narrative context. This gives *Hayrat ul Abror* a strong didactic quality.

Chaucer also incorporates proverbial and moralizing expressions into his narratives. Characters frequently make statements concerning marriage, wealth, age, love, honor, and human behavior. However, Chaucer sometimes places contradictory proverbs or moral statements next to each other, allowing different characters to defend opposing positions.

This difference is particularly important for comparative linguistics. In Navoi, moral generalization frequently strengthens the authority of the ethical message. In Chaucer, moral generalization can also become a tool for character construction and irony.

Direct and Indirect Moralization

One of the most important differences between the works is the degree of directness in moral communication. Navoi's text is strongly didactic. The narrator or poet often speaks directly about moral values and advises the reader about proper conduct. Moral concepts are explicitly named and explained.



Chaucer frequently uses indirect moralization. A character's behavior, speech, contradictions, and consequences may reveal the moral significance of a situation without an explicit authorial statement. Irony becomes an essential interpretive mechanism.

For example, when a character describes himself or herself as virtuous while behaving in a contradictory manner, the reader is expected to recognize the discrepancy. The moral message therefore emerges from the interaction between words and actions.

This contrast can be described linguistically as a difference between explicit and implicit moral encoding. Navoi frequently encodes morality through lexical and propositional statements, while Chaucer often encodes it through pragmatic inference, irony, characterization, and narrative context.

The Role of Characterization

Characterization is another major mechanism of moral representation. In *Hayrat ul Abror*, exemplary figures and negative examples help demonstrate desirable and undesirable qualities. Characters can function as embodiments of ethical principles.

In *The Canterbury Tales*, characterization is much more socially diverse. The pilgrims represent different professions and social groups, and their behavior reflects various moral possibilities. Their speech is particularly important because language reveals personality.

The Knight, Miller, Wife of Bath, Pardoner, Friar, Merchant, Clerk, and other figures have distinctive linguistic and behavioral characteristics. Their stories also reflect their personal interests and values. Consequently, language becomes evidence through which readers construct moral interpretations.

This aspect of Chaucer's work demonstrates that moral meaning can be generated not only by vocabulary but also by discourse style. A person's choice of words, tone, claims, repetitions, and rhetorical strategies may reveal moral qualities that are not explicitly named.

Cultural Similarities

Despite their different historical and cultural environments, Navoi and Chaucer demonstrate several important similarities. Both writers are deeply concerned with human behavior. Both criticize greed, hypocrisy, pride, dishonesty, and abuse of power. Both value knowledge, justice, generosity, and morally responsible behavior.



Both authors also understand literature as a means of observing society. Their works contain representations of different social groups and professions. Through these representations, they explore the relationship between individual morality and social institutions. Another important similarity is the use of contrast. Virtue becomes more visible when placed alongside vice. Honesty is understood through its opposition to deception. Generosity becomes meaningful in contrast with greed. Wisdom becomes clearer when contrasted with ignorance. Both authors therefore use semantic opposition as a fundamental strategy for organizing moral meaning.

Cultural Differences

The differences between the two works are equally significant. Navoi's ethical framework is strongly connected with Islamic philosophy, Sufi thought, Persianate literary traditions, and Central Asian cultural values. Moral perfection is frequently understood as part of a spiritual process.

Chaucer's moral world is shaped by medieval Christianity, European social institutions, feudal relationships, urban culture, commerce, and the emerging complexity of English society. His work frequently emphasizes the contradictions between social appearance and actual behavior.

Another difference concerns authorial voice. Navoi generally provides a stronger explicit moral framework, while Chaucer often allows competing perspectives to coexist. This does not mean that Chaucer lacks moral concerns. Rather, he expresses them through irony, narrative contrast, characterization, and the consequences of actions.

The two authors also differ in their representation of social diversity. Chaucer's pilgrimage framework brings together a broad range of social characters whose individual voices create a polyphonic narrative. Navoi's work is more unified in its philosophical and didactic orientation.

Translation and the Problem of Equivalence

Comparing moral concepts across Uzbek and English literary traditions raises important questions about translation. A moral term in one language rarely has an exact equivalent in another language because words carry cultural associations in addition to dictionary meanings. For instance, a classical Uzbek concept associated with *muruvvat* may include meanings related to generosity, benevolence, kindness,



and noble conduct. Translating it simply as “kindness” may preserve part of its semantic content while losing some cultural and ethical associations. Similarly, the English concept of “charity” has religious, social, and ethical meanings that may not correspond perfectly to a single Uzbek word. The translator must therefore consider not only lexical equivalence but also context, historical meaning, religious associations, and literary function. The translation of metaphors presents an additional difficulty. A metaphor based on a culturally familiar image may lose its effect when transferred into another linguistic tradition. Therefore, comparative analysis should distinguish between lexical equivalence and conceptual equivalence.

Pragmatic Expression of Morality

Moral meaning is also produced through pragmatics, or the relationship between language and its use in context. A sentence can have a literal meaning and a different implied moral meaning.

Chaucer makes extensive use of pragmatic ambiguity. A character may praise someone while actually criticizing them through irony. A statement may appear complimentary but become negative when considered alongside the speaker's previous behavior.

Navoi's pragmatic strategies are often more directly connected with instruction and reflection. However, metaphor, contrast, and contextual implication also allow readers to interpret moral meanings beyond the literal level. This demonstrates that moral concepts cannot be studied only through dictionaries. A complete linguistic analysis must consider discourse, context, speaker intention, narrative structure, cultural knowledge, and the relationship between literal and figurative meaning.

The Significance of the Comparison

The comparison of *Hayrat ul Abror* and *The Canterbury Tales* demonstrates that moral concepts are simultaneously universal and culturally specific. Human societies share many fundamental ethical concerns, but they verbalize them through different linguistic and literary mechanisms.

Navoi's language demonstrates the capacity of classical Turkic literature to express complex philosophical and ethical ideas through rich metaphorical, symbolic, and didactic structures. His treatment of morality is closely connected with spiritual development, knowledge, justice, generosity, and human dignity.



Chaucer's language demonstrates the flexibility of Middle English as a medium for social observation, irony, characterization, and moral debate. His characters embody contradictory moral positions, and their speech becomes an important source of ethical interpretation.

The two works therefore complement one another as objects of comparative linguistic research. They show that morality can be communicated directly through explicit statements and indirectly through narrative, irony, metaphor, characterization, and pragmatic implication.

RESULTS

The comparative analysis of Alisher Navoi's *Hayrat ul Abror* and Geoffrey Chaucer's *The Canterbury Tales* demonstrates that moral concepts are expressed through a combination of lexical, semantic, stylistic, metaphorical, pragmatic, and narrative resources in both literary traditions. Although the two works belong to different linguistic and cultural environments, the analysis reveals a considerable degree of conceptual similarity in their treatment of fundamental moral categories such as justice, honesty, generosity, knowledge, humility, compassion, greed, pride, deception, and hypocrisy. At the same time, substantial differences can be observed in the linguistic realization and literary presentation of these concepts.

The results indicate that Navoi's representation of moral concepts is predominantly explicit, philosophical, and didactic. Abstract moral nouns and ethically marked vocabulary play a central role in constructing the conceptual framework of *Hayrat ul Abror*. Concepts associated with justice, knowledge, generosity, patience, humility, and human dignity are repeatedly reinforced through lexical repetition, semantic opposition, metaphorical imagery, and generalized statements. This linguistic pattern creates a relatively clear relationship between a particular moral quality and its evaluation. Positive concepts are associated with spiritual and social perfection, whereas negative concepts are presented as obstacles to individual and communal development. The analysis also shows that semantic opposition is one of the most productive mechanisms of moral expression in Navoi's work. Pairs such as justice and injustice, knowledge and ignorance, generosity and greed, humility and pride, and truth and falsehood create a binary semantic structure through which ethical values become more recognizable. Such oppositions are not merely stylistic devices but also function as conceptual structures that guide the reader toward the ethical interpretation of human behavior. The frequent use of



contrasting concepts contributes to the didactic character of the poem and strengthens the relationship between language and moral instruction. Another significant result concerns the role of metaphor and symbolism. In *Hayrat ul Abror*, abstract ethical concepts are frequently conceptualized through concrete images and symbolic relationships. Knowledge and spiritual awareness can be associated with light, while ignorance and moral deficiency can be represented through darkness or other negative images. Similarly, the notions of journey, wealth, generosity, and human character may acquire metaphorical meanings extending beyond their literal interpretation. This demonstrates that moral concepts in classical Uzbek literary discourse are not restricted to direct lexical expressions but are deeply embedded in figurative language.

The investigation further demonstrates that religious and philosophical vocabulary constitutes an important semantic layer in Navoi's representation of morality. Moral qualities are frequently connected with spiritual development and the individual's relationship with higher ethical principles. Consequently, concepts such as knowledge, justice, generosity, and humility acquire meanings that extend beyond ordinary social behavior. They become components of a broader ethical and spiritual worldview. This characteristic distinguishes Navoi's moral discourse from a purely secular representation of human behavior.

The analysis of *The Canterbury Tales* reveals a different but equally complex method of verbalizing moral concepts. Chaucer relies less on direct philosophical explanation and more heavily on characterization, dialogue, irony, narrative events, and social interaction. Moral qualities are frequently revealed through what characters say and do rather than through direct authorial statements. As a result, the reader often needs to interpret the discrepancy between a character's self-presentation and actual behavior. One of the most prominent findings is the importance of irony in Chaucer's representation of morality. Characters may describe themselves or others in apparently positive terms, while their behavior provides evidence of greed, hypocrisy, vanity, dishonesty, or self-interest. This creates a distance between literal linguistic meaning and implied moral meaning. The interpretation of a moral concept therefore depends not only on vocabulary but also on context, speaker identity, narrative situation, and the relationship between words and actions.

The results further indicate that characterization functions as a major linguistic and narrative mechanism for moral expression in *The Canterbury Tales*. Different characters represent different social positions, professions, values, and behavioral



patterns. Their speech styles contribute to the construction of their moral identities. In this respect, Chaucer demonstrates that moral meaning can be encoded through discourse style itself. Vocabulary, tone, rhetorical strategies, claims, repetitions, and forms of self-presentation can reveal characteristics that are not directly named.

A comparison of the two works shows that justice is conceptualized as both an individual and social value, although it is presented through different linguistic strategies. Navoi tends to discuss justice as a fundamental principle of proper human and social organization, whereas Chaucer frequently dramatizes questions of justice through interpersonal conflicts, social relationships, punishment, law, and consequences. This difference demonstrates a movement from explicit ethical conceptualization in Navoi toward more context-dependent and narrative realization in Chaucer.

The concept of generosity also demonstrates considerable conceptual similarity between the two works. Both literary traditions associate generosity with positive human behavior and criticize excessive attachment to material wealth. However, Navoi generally presents generosity as an established moral ideal, while Chaucer frequently investigates the motivations behind apparently generous actions. In Chaucer's narratives, an action may have a positive external appearance but a questionable internal motivation. Therefore, the moral interpretation depends on both action and intention.

The results concerning knowledge demonstrate another important similarity. In Navoi's work, knowledge is strongly associated with wisdom, moral development, and spiritual improvement. Ignorance is represented as a limitation of human potential. In Chaucer's work, knowledge is also valuable, but the possession of knowledge or professional authority does not automatically guarantee moral virtue. Characters may possess specialized knowledge while demonstrating selfishness, hypocrisy, or poor judgment. This difference highlights the importance of distinguishing intellectual competence from ethical wisdom.

The comparative analysis of honesty, deception, and hypocrisy shows that both authors are concerned with the discrepancy between appearance and reality. Navoi generally establishes truthfulness as an essential moral quality and presents falsehood as a negative ethical condition. Chaucer explores this opposition through complex social interactions in which characters manipulate language to achieve personal objectives. Consequently, deception in *The Canterbury Tales* is particularly significant at the pragmatic level because characters use speech not merely to communicate information but also to influence, persuade, conceal, and manipulate.



The findings also demonstrate that the two works use different degrees of authorial moral authority. Navoi's narrative voice frequently establishes an ethical framework within which the reader can evaluate characters and actions. Chaucer's narrative structure is more dialogic and allows multiple perspectives to coexist. Different characters may express contradictory attitudes toward morality, marriage, wealth, religion, or social behavior. This plurality does not eliminate moral concerns; rather, it makes moral interpretation more dependent on context and reader participation. From a linguistic perspective, the research reveals that historical differences between Chagatai Turkic and Middle English contribute to differences in the expression of moral concepts. Navoi's language contains a substantial combination of Turkic, Persian, and Arabic lexical resources, particularly in philosophical and religious discourse. Chaucer's Middle English similarly reflects the influence of French and Latin, especially in religious, legal, intellectual, and administrative vocabulary. Therefore, the lexical systems of both works reflect their respective historical and cultural environments.

The analysis additionally reveals that moral concepts are often expressed through culturally specific lexical units whose meanings cannot always be transferred through direct lexical equivalence. A concept expressed through a particular classical Uzbek term may contain religious, philosophical, social, and emotional associations that exceed the meaning of a single English equivalent. Similarly, English medieval concepts may contain cultural associations that cannot be completely reproduced through contemporary Uzbek vocabulary. This finding emphasizes the importance of conceptual rather than purely lexical equivalence in comparative and translation studies. Another important result is that moral meaning is constructed at several linguistic levels simultaneously. At the lexical level, ethically marked words directly identify concepts such as justice, generosity, truth, greed, and pride. At the semantic level, oppositions and associations establish relationships between positive and negative moral qualities. At the stylistic level, metaphor, repetition, parallelism, and irony intensify moral meanings. At the pragmatic level, context and speaker intention influence interpretation. At the narrative level, characters and events demonstrate the consequences of moral choices.

The comparative results therefore suggest that the verbalization of morality should be understood as a multidimensional linguistic phenomenon. Neither the Uzbek nor the English material can be adequately analyzed through isolated vocabulary alone. A complete interpretation requires attention to historical language,



cultural context, literary genre, discourse structure, figurative language, and pragmatic meaning. The findings also demonstrate that both Navoi and Chaucer use literature as a means of social observation. Their works contain representations of individuals from different social positions and provide opportunities to examine the relationship between personal morality and social structures.

However, Navoi's representation is more strongly organized around a unified ethical and philosophical framework, while Chaucer's representation is characterized by greater social diversity and competing voices.

Overall, the results demonstrate a strong conceptual convergence between the two literary works combined with significant differences in verbal realization. Universal moral concepts such as justice, honesty, generosity, knowledge, humility, and compassion are recognizable in both texts, but their linguistic expression reflects the distinct cultural, religious, historical, and literary traditions of classical Uzbek and medieval English societies. Navoi predominantly employs explicit moral instruction, philosophical reflection, symbolic imagery, and semantic opposition, whereas Chaucer relies more extensively on irony, characterization, dialogue, narrative contrast, and pragmatic implication. These findings confirm that comparative analysis of *Hayrat ul Abror* and *The Canterbury Tales* provides valuable insight into the relationship between language, culture, literature, and moral cognition.

CONCLUSION

The verbal expression of moral concepts in Alisher Navoi's *Hayrat ul Abror* and Geoffrey Chaucer's *The Canterbury Tales* reveals both significant similarities and important differences between Uzbek and English literary traditions. Both works investigate fundamental questions of human morality, including justice, honesty, generosity, knowledge, humility, greed, pride, deception, and social responsibility. However, these concepts are encoded through different linguistic and literary strategies.

Navoi primarily presents morality through philosophical reflection, didactic statements, symbolic imagery, semantic contrasts, religious vocabulary, aphoristic expressions, and exemplary models of human behavior. His moral language is closely connected with Islamic ethical thought and the intellectual traditions of classical Central Asian literature. Moral concepts are frequently presented as universal principles that guide individuals toward spiritual and social perfection.



Chaucer, in contrast, relies extensively on characterization, dialogue, irony, narrative conflict, social observation, and the interaction between appearance and reality. His pilgrims and their stories create a complex discourse in which moral concepts emerge from different voices and perspectives. The reader is frequently required to interpret the ethical significance of behavior rather than receiving a single explicit moral conclusion.

From a comparative linguistic perspective, the two works demonstrate that moral concepts are not restricted to isolated lexical items. They are expressed through entire systems of language, including vocabulary, metaphor, syntax, discourse, pragmatics, narrative structure, and cultural symbolism. The historical development of Chagatai Turkic and Middle English also demonstrates how cultural contact and intellectual traditions influence the vocabulary through which societies conceptualize morality.

Ultimately, the comparison of *Hayrat ul Abror* and *The Canterbury Tales* shows that literature provides a powerful linguistic record of cultural morality. Although Navoi and Chaucer belonged to different geographical, religious, and linguistic environments, both recognized the importance of ethical behavior in human life. Their works demonstrate that concepts such as justice, honesty, generosity, wisdom, humility, and compassion can cross cultural boundaries while retaining distinctive local forms. Studying these similarities and differences contributes not only to comparative literature but also to linguistics, cultural studies, translation studies, and intercultural communication. The two masterpieces therefore provide valuable evidence of how different languages transform universal human ethical concerns into culturally meaningful literary expression.

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CONSCIOUSNESS UNDER PRESSURE

*Hallucinogens and Mixed Delusions — How Chemistry and Belief
Can Bend the Mind's Mirror*

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Abstract

Consciousness is the one thing each of us knows with absolute certainty — and the one thing science has the hardest time explaining. It is also fragile. Certain molecules, taken deliberately or by accident, can rearrange it within minutes; certain illnesses can entrench false beliefs so stubbornly that no argument can dislodge them. This article tells the story of two ways the mind's grip on reality can loosen: hallucinogens, the classic psychedelic compounds now undergoing a remarkable clinical renaissance, and mixed delusions, the clinically common but under-discussed condition in which a person harbours two or more delusional themes at once. Written in narrative form, the article traces what consciousness is, how drugs such as psilocybin and LSD alter it, what delusions are and why the “mixed” subtype matters, and where these two territories — one voluntary and temporary, one involuntary and persistent — unexpectedly overlap.

1. The Strangest Thing You Own

Right now, as you read this sentence, something extraordinary is happening inside your skull. Light patterns strike your retinas, sound waves press against your eardrums, and within fractions of a second these physical events are transformed into a private, inner world: the smell of coffee, the feeling of the chair beneath you, the very sense that you are someone having an experience. That transformation — from electrochemistry to inner life — is consciousness, and philosophers have been



tripping over it for millennia. The physicist Arthur Eddington remarked nearly a century ago that if we want to understand the universe, we should perhaps start with the one piece of it we know from the inside.

Consciousness is also, for all its mystery, surprisingly easy to perturb. A night of missed sleep blurs it; a fever distorts it; a blow to the head extinguishes it. And certain molecules — a class of compounds we call hallucinogens — can disassemble and reassemble it in the space of an hour, producing experiences that subjects describe as among the most meaningful of their lives, or among the most terrifying. Meanwhile, at the opposite end of the spectrum from voluntary chemical exploration, there are people whose consciousness has not been opened but narrowed: people gripped by fixed, false beliefs known as delusions, which in the “mixed” form arrive not as one coherent story but as several incompatible ones braided together. Understanding both phenomena — and how they differ — is the work of this article.

2. What Consciousness Actually Is

Clinicians and neuroscientists usually split consciousness into two ingredients. The first is wakefulness — the basic level of alertness running from deep anaesthesia through dreamless sleep to full attention, largely managed by the brainstem and thalamus. The second, richer ingredient is awareness: the content of experience, the “what it is like” of seeing red or feeling sad. A person in a dream is asleep (low wakefulness) yet vividly aware. A patient in a vegetative state may open their eyes (preserved wakefulness) while awareness is absent. Much of the brain's busiest wiring — including a constellation of regions called the default mode network, active when we daydream, remember, and construct our sense of self — appears to act as the stage on which awareness plays.

This framework matters because hallucinogens and delusions attack consciousness differently. Hallucinogens broadly preserve wakefulness while flooding awareness with novel, disorganised content — the world remains vivid, but its rules seem suspended. Delusions, by contrast, leave perception largely intact while corrupting the beliefs woven from it: the world looks the same, but its meaning has been rewritten. One alters the raw material of experience; the other alters the conclusions drawn from it. Holding that distinction clearly will matter in everything that follows.



Figure 1. Artistic rendering of the human brain's connective architecture — the physical substrate of consciousness that both hallucinogens and delusional disorders leave visible on a scanner yet profoundly change in experience.

3. Hallucinogens: Chemistry That Dissolves the Self

The classic hallucinogens — LSD, psilocybin, mescaline, and DMT — are united by a surprisingly specific talent: they mimic serotonin, one of the brain's principal chemical messengers, at a particular receptor called 5-HT_{2A}. When these molecules occupy that receptor in the cortex, the brain's normally tidy traffic of prediction and perception loosens. Regions that usually exchange information along fixed highways begin to crosstalk. The default mode network, which neuroscientists suspect helps construct the sense of a continuous self — the “I” that remembers yesterday and plans tomorrow — shows reduced coordination. The result, in the memorable phrasing of one research group, is that the brain becomes “hyperconnected”: its segregated networks talk to one another as they rarely do in ordinary life.

Subjective reports match the scans eerily well. Boundaries soften: the wall between self and world, between listener and music, between present moment and distant memory. Synaesthesias bloom — people hear colours or see sounds. Time stretches or vanishes. And a substantial share of volunteers in modern studies describe the experience as among the most spiritually significant of their lives — a statistic that has moved hallucinogens from the counterculture into the clinic with astonishing



speed. The same chemistry, of course, explains the compounds' dangers: in an uncontrolled setting, with an anxious or predisposed mind, the loosened grip on reality can tip into terror — the infamous “bad trip” — and in vulnerable individuals, into lasting problems.

Compound	Natural source / origin	Primary target	Typical duration	Research status (2026)
Psilocybin	Psilocybe “magic” mushrooms	Serotonin 5-HT2A agonist (prodrug)	4–6 hours	Phase 2–3 trials for depression; therapy programmes authorised in parts of Australia and the U.S.
LSD	Synthesised (ergot alkaloid chemistry)	Serotonin 5-HT2A agonist	8–12 hours	Trials for anxiety and addiction; microdosing studies ongoing
DMT	Plants (e.g., Psychotria, Mimosa); trace endogenous	Serotonin 5-HT2A agonist	15–60 minutes (smoked)	Early-phase depression trials; studied as ayahuasca with MAOIs
Mescaline	Peyote and San Pedro cacti	Serotonin 5-HT2A ($\pm$ others)	10–14 hours	Limited clinical data; mostly historical and survey research
MDMA*	Synthesised	Serotonin release +	3–6 hours	Phase 3 PTSD trials;



		receptor effects		regulatory decisions pending
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*Table 1. Principal classic hallucinogens and their clinical-research status.
(*MDMA is technically an empathogen rather than a classic hallucinogen but
shares the therapeutic-research wave.)*

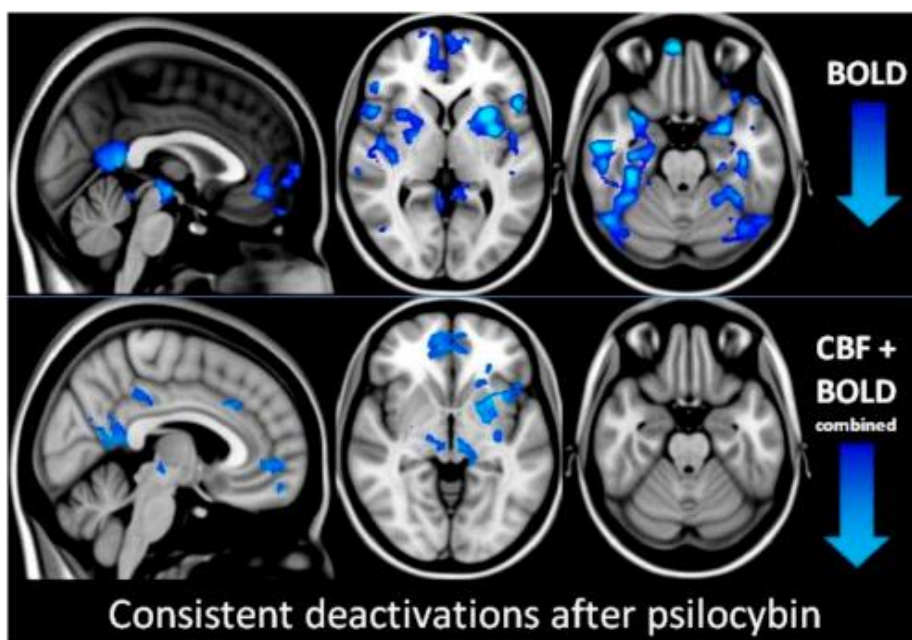


Figure 2. fMRI studies of psilocybin show consistent decreases in blood flow and connectivity in hub regions — a neural signature of the “dissolved self” reported by volunteers (Carhart-Harris et al., PNAS, 2012).

4. The Clinical Renaissance

For roughly thirty years, research on these compounds was frozen — a casualty of the mid-twentieth-century war on drugs. Then, cautiously, around the turn of the millennium, licences were granted, ethics boards convened, and a new generation of studies began. The results have been striking enough to keep the funding flowing. In randomised trials, psilocybin-assisted psychotherapy has produced rapid, large reductions in depression scores in patients who had failed multiple conventional



treatments; MDMA-assisted therapy has shown strong effects in post-traumatic stress disorder; and cancer patients facing death have reported lasting reductions in existential anxiety after a single supported session.

Crucially, the modern model is nothing like recreational use. It is a structured choreography of three acts: preparation, in which the patient builds trust with trained therapists and sets an intention; the dosing session itself, in a comfortable room with eyeshades and curated music, with therapists present but mostly silent; and integration, the weeks afterwards in which the experience is unpacked and woven into ordinary life. The drug, in this framing, is less a treatment than an amplifier — something that makes psychotherapy deeper, faster, and more durable. Whether that framing survives the largest and most rigorous trials now underway remains an open question; the field's own methodologists have warned loudly about expectancy effects, broken blinding, and small samples. The honest summary: the signal is promising, the mechanisms are plausible, and the verdict is not yet final.

Stages of Psychedelic Therapy

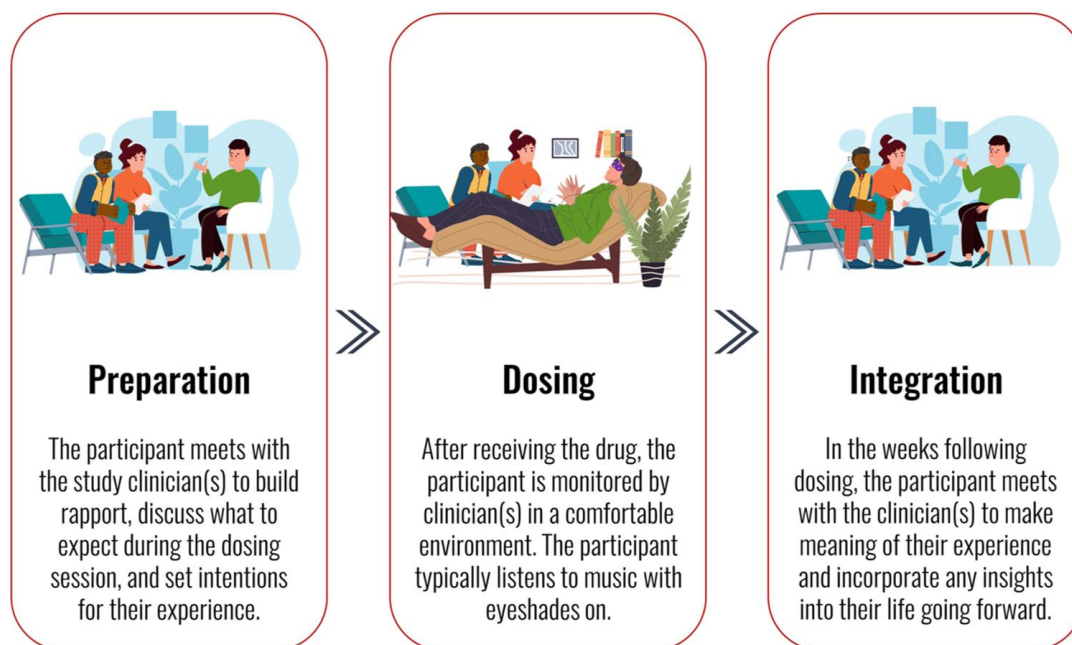


Figure 3. The three-stage architecture of modern psychedelic-assisted therapy: preparation, dosing, and integration (adapted from methodological guidance for clinical trials).

5. Delusions: Beliefs That Refuse to Die



Now shift scenes, from the temporary dissolution of the self to its opposite error: certainty without evidence. A delusion is conventionally defined by psychiatrists as a fixed, false belief — one held with remarkable conviction, impervious to contradictory argument or plain proof, and not explained by the person's culture or upbringing. The qualifier “fixed” does most of the clinical work.

Ordinary wrong beliefs bend under evidence; delusions do not. A patient shown clear bank statements may still insist that a hidden organisation is draining his account; a woman whose partner has never been out of her sight may remain convinced of his infidelity; a man examined repeatedly by dermatologists may continue to feel parasites crawling beneath intact skin.

Classically, delusional disorder is catalogued by theme. The erotomaniac type holds that someone — often a stranger of higher status — is secretly in love with them. The grandiose type harbours inflated beliefs about power, genius, or identity. The jealous type constructs unfaithfulness from nothing. The persecutory type, the most common in clinical practice, spins plots of surveillance, poisoning, and harm. The somatic type locates the catastrophe in the body: infestation, deformity, foul odour, failing organs. And then there is the type that concerns us most here: the mixed type, in which two or more themes coexist without any single one dominating.

Subtype	Core false belief	How it may look in daily life
Erotomaniac	“This person is in love with me”	Fixation on a celebrity, boss, or stranger; repeated unwanted contact attempts
Grandiose	“I have a great gift, power, or destiny”	Claims of secret inventions, special missions, or royal identity
Jealous	“My partner is unfaithful”	Endless checking of phones, searches for evidence, accusations
Persecutory	“I am being watched, harmed, or conspired against”	Complaints to authorities, barricading doors, deep mistrust of doctors



Somatic	“My body is diseased, infested, or defective”	Doctor-shopping, skin examinations, demands for surgery
Mixed	Two or more themes, none predominant	A shifting mosaic — persecutory one month, grandiose the next

Table 2. Thematic subtypes of delusional disorder, per DSM-5-TR classification. The mixed type (highlighted) is the focus of this article.

6. Mixed Delusions: The Clinical Mosaic

Pure, single-theme delusional disorder makes tidy textbook reading; mixed delusions make real clinics. In the mixed type, the patient carries several delusional themes at once, and the balance among them can drift over time. A woman may simultaneously believe that her neighbours are poisoning her water (persecutory), that she alone has discovered the cure for cancer (grandiose), and that a surgeon she met once is secretly devoted to her (erotomantic). Nothing in this constellation is bizarre enough to be obviously impossible, which is precisely what makes mixed delusions so clinically slippery: each strand is woven from plausible fabric, and together they form a private narrative that can hold together for years.

The mixed type also illustrates something important about how delusions behave. They are not random noise; they are attempts — pathological ones — at meaning-making. The mind, confronted with coincidence, ambiguity, and anxiety, builds explanations, and in the delusional mind the normal brakes on that construction process fail. Neurobiologically, delusions are increasingly understood as disorders of prediction: the brain's machinery for weighing evidence against prior belief tips too far toward belief, so that everything confirms the story and nothing disconfirms it. Notably, the same predictive-machinery account has been invoked to explain hallucinogen effects — the difference being that the drug's distortion is pharmacological, temporary, and (in a therapeutic setting) held safely, while the delusional distortion is entrenched, self-sustaining, and often invisible to the person living inside it.



This is why clinicians screen so carefully before psychedelic-assisted therapy: a personal or family history of psychotic-spectrum illness is generally an exclusion criterion, because a compound that loosens the mind's grip on reality must never be offered to a mind already struggling to hold it.

Feature	Hallucinogen intoxication	Mixed delusional disorder
Onset	Minutes to hours after dosing	Insidious; often months of gradual conviction
Insight	Usually preserved (“this is the drug”)	Absent; the beliefs feel like facts
Duration	Hours; resolves as drug clears	At least 1 month; often chronic
Belief structure	Fluid, shifting, often mystical	Fixed themes; internally woven narrative
Perception vs. belief	Perception vividly altered	Perception largely intact; interpretation corrupted
Course	Self-limited	Requires treatment; fluctuates with stress
Typical treatment	Reassurance, “talking down”, supportive care	Antipsychotics, psychotherapy, sometimes long-term care

Table 3. A clinician's-eye comparison: the voluntary, temporary alteration of hallucinogen intoxication versus the involuntary, persistent alteration of mixed delusional disorder.

7. Where the Two Territories Meet

Voluntary and involuntary alterations of consciousness meet in a few uneasy borderlands. Substance-induced psychotic disorder is the most direct: heavy or prolonged hallucinogen use can, in a minority of users, trigger psychotic episodes that outlast the drug itself — weeks or months of delusions and hallucinations that earn their own diagnosis. A related but rarer condition, hallucinogen persisting perception disorder (HPPD), leaves visual disturbances — trailing lights, visual snow, geometric overlays — lingering for months or years after the last dose. Then



there is the subtler question researchers are only beginning to study: whether the mystical-type experiences that make psychedelic therapy effective bear any family resemblance to the conviction-certainty of delusion. Both involve powerful meaning-making; one arrives with an intact witness who knows the experience will end, the other without. The difference, clinicians insist, is everything.

History adds a cautionary footnote. The optimism of the 1950s and 60s — when LSD was briefly hailed as a psychiatric miracle — collapsed under recreational excess, legal prohibition, and a research freeze that cost science decades. Today's renaissance is deliberately more disciplined: registered trials, blinded designs where possible, trained therapists, exclusion criteria, and integration protocols. Whether that discipline is enough will be decided by the large phase 3 programmes whose results are due within this decade.

8. Hard Questions on Both Fronts

Neither territory is free of ethical weight. For hallucinogens: Who should receive them, and who screens the screeners? What does informed consent mean for a compound that can produce experiences patients describe as beyond words? Can blinding ever really hold when the drug announces itself unmistakably? And how do societies regulate a therapy whose most potent ingredient may be the quality of the human relationship surrounding the dose? For delusional disorders: how do clinicians honour a person's autonomy when that person's map of reality is distorted — persuasion rarely works, coercion damages trust, and yet untreated delusions can ruin marriages, careers, and sometimes lives? The mixed form compounds the difficulty, because its shifting themes can evade the neat diagnostic categories on which treatment pathways depend.

And beneath both fields lies the oldest question of all: what consciousness is for, and what it costs to keep it stable. The hallucinogen literature suggests that loosening the self, briefly and safely, can sometimes heal it. The delusion literature shows what happens when the self's story hardens past the reach of evidence. Between dissolution and rigidity lies the narrow, workable middle ground we call sanity — a condition neither guaranteed nor fully understood, and worth defending with both chemistry and compassion.

9. Conclusion: The Narrow Ledge Between Dissolution and Rigidity



Consciousness, this article has argued, is best understood not as a single light switched on or off, but as a delicate negotiation between wakefulness and awareness, between incoming evidence and prior belief. Hallucinogens and mixed delusions disturb that negotiation from opposite directions. The first floods awareness with novelty while leaving the witness intact, and — in careful clinical hands — may turn that flood into healing. The second corrupts belief itself, so that the witness vanishes into the story, and healing requires patiently rebuilding the capacity to doubt.

The two phenomena may never share a treatment, but they share a lesson: the mind's grip on reality is neither a lock nor a given. It is a skill — practised, fragile, and improvable. The scientists mapping serotonin receptors in fMRI machines and the psychiatrists sitting with patients who believe they are poisoned are working on the same mystery from two sides. Somewhere between the scan and the consulting room lies the answer to how a kilogramme of tissue generates a world — and how to help when that world goes wrong.



Figure 4. A patient in a supported psilocybin session — eyeshades on, music playing, therapists nearby: the carefully staged setting that distinguishes modern therapy from recreational use (Johns Hopkins Medicine).

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YOSHLAR BANDLIGI VA TADBIRKORLIGINI QO‘LLAB- QUVVATLASHNING YANGI IMKONIYATLARI

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ANNOTATSIYA: Mazkur maqolada O‘zbekistonda yoshlar bandligini ta‘minlash, ularning tadbirkorlik tashabbuslarini qo‘llab-quvvatlash, zamonaviy kasblarga yo‘naltirish hamda mehnat bozorida raqobatbardoshligini oshirish borasida amalga oshirilayotgan islohotlar tahlil qilinadi. Shuningdek, yoshlarning iqtisodiy faolligini kuchaytirishda ta‘lim, kasbiy tayyorgarlik, raqamli texnologiyalar, innovatsion loyihalar, startaplar va imtiyozli moliyaviy mexanizmlarning o‘rni yoritiladi. Yoshlar tadbirkorligini rivojlantirish nafaqat yangi ish o‘rinlarini yaratish, balki hududlarning ijtimoiy-iqtisodiy taraqqiyotini jadallashtirishning muhim omili ekanligi asoslab beriladi.

Kalit so‘zlar: yoshlar, bandlik, tadbirkorlik, mehnat bozori, kasb-hunar, startap, innovatsiya, raqamli iqtisodiyot, biznes, investitsiya, moliyaviy qo‘llab-quvvatlash, yangi ish o‘rinlari, yoshlar siyosati.

Kirish

Bugungi globallashtirish va texnologik taraqqiyot sharoitida yoshlarning iqtisodiy faolligini oshirish har qanday davlatning uzoq muddatli taraqqiyot strategiyasida ustuvor yo‘nalishlardan biri hisoblanadi. Chunki yoshlar — jamiyatning eng faol, yangilikka intiluvchan va katta salohiyatga ega qatlami. Ularning bilim, ko‘nikma va tashabbuslarini to‘g‘ri yo‘naltirish mamlakatning iqtisodiy qudratini mustahkamlash, yangi ish o‘rinlarini yaratish va innovatsion rivojlanishni jadallashtirishga xizmat qiladi.

O‘zbekiston aholisining salmoqli qismini yoshlar tashkil etishi mamlakat uchun katta imkoniyat bilan birga muhim vazifalarni ham yuzaga keltiradi. Bir tomondan, yoshlarning katta qatlami — ulkan inson kapitali. Ikkinchi tomondan esa, ularni munosib ish bilan ta‘minlash, zamonaviy kasblarga o‘rgatish, tadbirkorlikka jalb qilish va mehnat bozorida munosib o‘rin egallashlari uchun zarur sharoitlarni yaratish doimiy e‘tibor talab etadi. Shu nuqtayi nazardan, bugungi kunda yoshlarni faqatgina ish bilan ta‘minlash emas, balki ularni **daromad yarata oladigan,**



mustaqil qaror qabul qiladigan va yangi ish o‘rinlarini tashkil etadigan faol iqtisodiy subyektga aylantirish muhim ahamiyat kasb etmoqda.

Yoshlar bandligini ta’minlash — barqaror taraqqiyot omili

Bandlik insonning nafaqat iqtisodiy, balki ijtimoiy hayotdagi o‘rnini ham belgilaydi. Ayniqsa, yoshlar uchun munosib ish o‘rniga ega bo‘lish mustaqil hayotga qadam qo‘yish, o‘z imkoniyatlarini namoyon etish va kelajak rejalarini amalga oshirish uchun muhim omildir. Zamonaviy mehnat bozori esa avvalgidan tubdan farq qiladi. Bugungi kunda ish beruvchilar nafaqat diplomga, balki amaliy ko‘nikma, xorijiy tillarni bilish, raqamli savodxonlik, muloqot qobiliyati, jamoada ishlash va muammolarga ijodiy yechim topish kabi kompetensiyalarga ham katta ahamiyat bermoqda.

Shuning uchun yoshlar bandligini ta’minlash siyosati ta’lim tizimi va mehnat bozori o‘rtasidagi uzviy bog‘liqlikni kuchaytirishni talab etadi. Ta’lim muassasalarida berilayotgan bilim amaliyot bilan uyg‘unlashsa, yoshlarning ish topish imkoniyati ham, ish beruvchilarning malakali mutaxassisga bo‘lgan ehtiyoji ham qondiriladi. Bu jarayonda kasb-hunarga o‘qitish markazlari, oliy ta’lim muassasalari, professional ta’lim tashkilotlari, xususiy o‘quv markazlari va ish beruvchilar o‘rtasidagi hamkorlik alohida ahamiyatga ega.

Tadbirkorlik — yoshlar uchun yangi imkoniyatlar maydoni

Yoshlar bandligini ta’minlashning eng samarali yo‘llaridan biri — ularni tadbirkorlik faoliyatiga keng jalb etishdir. Tadbirkorlik yoshga nafaqat o‘z daromadini yaratish, balki boshqa fuqarolar uchun ham ish o‘rinlari tashkil etish imkonini beradi. Bir yosh tadbirkorning muvaffaqiyatli loyihasi vaqt o‘tishi bilan kichik biznesdan o‘rta biznesga, keyinchalik esa yirik korxonaga aylanishi mumkin. Ayniqsa, yoshlarning yangi g‘oyalarga boyligi, texnologiyalarni tez o‘zlashtirishi va zamonaviy iste’molchilar ehtiyojini yaxshi anglay olishi ularni innovatsion tadbirkorlik uchun muhim kuchga aylantirmoqda. Bugungi kunda yoshlar uchun an’anaviy biznes bilan bir qatorda quyidagi yo‘nalishlarda ham katta imkoniyatlar mavjud:

- IT va dasturlash;
- elektron tijorat;
- raqamli marketing;
- grafik va veb-dizayn;
- ta’lim xizmatlari;
- turizm va servis;
- hunarmandchilik;



- agrotexnologiyalar;
- logistika;
- kreativ industriya;
- media va kontent yaratish;
- ekologik loyihalar;
- innovatsion startaplar.

Demak, zamonaviy tadbirkorlik uchun katta ishlab chiqarish binosi yoki katta boshlang'ich kapital har doim ham zarur emas. Ayrim hollarda bilim, g'oya, raqamli vositalar va to'g'ri biznes modeli ham muvaffaqiyatli faoliyat boshlash uchun yetarli bo'lishi mumkin.

Raqamli iqtisodiyot yoshlar uchun yangi mehnat bozorini yaratmoqda

Raqamlashtirish jarayoni yoshlarning bandligi va tadbirkorligi uchun yangi ufqlarni ochmoqda. Internet orqali xizmat ko'rsatish, masofadan ishlash, elektron savdo va frilans faoliyatining kengayishi yoshlarning geografik jihatdan cheklanmagan holda daromad topish imkoniyatini oshirmoqda. Bugungi yosh dasturchi, dizayner, tarjimon, marketolog, videomontajchi yoki kontent yaratuvchi o'z xizmatlarini nafaqat mahalliy, balki xorijiy mijozlarga ham taklif qilishi mumkin. Bu esa yoshlarning mehnat bozoridagi raqobatbardoshligini oshirish uchun xorijiy tillar va raqamli kompetensiyalarni egallash zaruratini kuchaytiradi.

Shuningdek, sun'iy intellekt texnologiyalarining rivojlanishi ham mehnat bozorining mazmunini o'zgartirmoqda. Ayrim kasblarning mazmuni transformatsiyalanayotgan bir paytda yangi mutaxassisliklar va yangi xizmat turlari yuzaga kelmoqda. Shu sababli yoshlarni kelajak kasblariga tayyorlash, ularning doimiy ravishda yangi bilim va ko'nikmalarni egallashiga sharoit yaratish muhimdir.

Yoshlar startaplari — innovatsion iqtisodiyotning muhim qismi

Yoshlar tadbirkorligini rivojlantirishda startap ekotizimining o'rni alohida. Startap — muayyan muammoni innovatsion yondashuv asosida hal etishga qaratilgan, tez rivojlanish va kengayish imkoniyatiga ega biznes tashabbusdir. Yoshlarning ko'plab g'oyalari dastlab oddiy loyiha sifatida shakllanadi. Biroq ularga mentorlik, moliyaviy ko'mak, biznes-reja tuzish, marketing, huquqiy maslahat va investorlar bilan aloqa qilish imkoniyati yaratilsa, bunday g'oyalar muvaffaqiyatli biznes loyihalarga aylanishi mumkin.

Ta'lim va tadbirkorlik uyg'unligi

Bugungi ta'lim tizimi yoshlarni faqat ish izlovchi emas, balki **ish o'rni yaratuvchi shaxs** sifatida tayyorlashga yo'naltirilishi lozim. Buning uchun oliy va professional ta'lim dasturlarida tadbirkorlik asoslari, biznes-rejalashtirish, moliyaviy



savodxonlik, loyiha boshqaruvi, marketing va raqamli texnologiyalar bo'yicha amaliy mashg'ulotlarni kuchaytirish maqsadga muvofiq. Talabalarning o'z mutaxassisligi bo'yicha kichik biznes loyihalarini ishlab chiqishi, startup tanlovlarida qatnashishi, real kompaniyalarda amaliyot o'tashi va muvaffaqiyatli tadbirkorlar bilan uchrashuvlarda ishtirok etishi ham ularning biznesga bo'lgan qarashlarini o'zgartiradi. Zero, tadbirkorlikni faqat nazariy o'rganish emas, balki amaliyot orqali o'zlashtirish samaraliroqdir.

Xulosa

Yoshlar bandligi va tadbirkorligini qo'llab-quvvatlash — mamlakatning bugungi iqtisodiy vazifasi emas, balki kelajak taraqqiyotining strategik yo'nalishidir. Chunki bugun bilim, kasb va tadbirkorlik ko'nikmalariga ega bo'lgan yoshlar ertaga mamlakat iqtisodiyotining asosiy harakatlantiruvchi kuchiga aylanadi. Yoshlarning bandligini ta'minlashda davlat tomonidan yaratilayotgan imkoniyatlar bilan bir qatorda, ularning shaxsiy intilishi, bilim olishga bo'lgan munosabati va tashabbuskorligi ham muhim ahamiyatga ega. Har qanday imkoniyatdan samarali foydalanish uchun, avvalo, yoshning o'zida maqsad, mas'uliyat va harakat bo'lishi kerak. Bugungi yosh uchun muvaffaqiyat formulasi tobora aniq shaklga ega bo'lmoqda: **sifatli ta'lim + zamonaviy kasb + raqamli ko'nikma + tashabbus + tadbirkorlik tafakkuri = barqaror bandlik va farovon kelajak.**

Shu bois yoshlarni ish bilan ta'minlash bilan bir qatorda, ularga **ish o'rnini yaratish imkoniyatini berish** ham zamonaviy yoshlar siyosatining muhim vazifalaridan biri bo'lishi kerak. Yoshlarning har bir g'oyasi, tashabbusi va intilishi qo'llab-quvvatlangan sari yangi loyihalar, yangi korxonalar va yangi ish o'rinlari paydo bo'ladi. Bu esa, o'z navbatida, nafaqat alohida yoshning, balki butun jamiyatning iqtisodiy farovonligi va taraqqiyotiga xizmat qiladi. Demak, yoshlar bandligi va tadbirkorligini qo'llab-quvvatlash — kelajak uchun investitsiyadir. Yosh avlodga yaratilayotgan har bir imkoniyat esa mamlakatning ertangi taraqqiyotiga qo'yilayotgan mustahkam poydevordir.

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**YOSHLAR — YANGI O‘ZBEKISTON TARAQQIYOTINING
STRATEGIK KUCHI**

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ANNOTATSIYA: Mazkur maqolada Yangi O‘zbekiston taraqqiyotida yoshlarning tutgan o‘rni, ularning intellektual, ilmiy, ma‘naviy va tadbirkorlik salohiyatini ro‘yobga chiqarish uchun yaratilayotgan imkoniyatlar tahlil etiladi. Yoshlarni zamonaviy bilim va kasb-hunarga yo‘naltirish, oliy ta‘lim va ilm-fanga jalb etish, innovatsion g‘oyalarini qo‘llab-quvvatlash, bandligini ta‘minlash hamda ijtimoiy faolligini oshirish mamlakatning uzoq muddatli taraqqiyot strategiyasining muhim yo‘nalishlaridan biri ekani yoritiladi. Shuningdek, yosh avlodning mamlakat iqtisodiyoti, ijtimoiy hayoti, ilm-fani, madaniyati va fuqarolik jamiyati rivojiga qo‘shayotgan hisssasi tahlil qilinib, yoshlar siyosatini yanada takomillashtirish bo‘yicha taklif va xulosalar ilgari suriladi.

KALIT SO‘ZLAR: yoshlar, Yangi O‘zbekiston, yoshlar siyosati, ta‘lim, ilm-fan, innovatsiya, tadbirkorlik, bandlik, intellektual salohiyat, raqamli texnologiyalar, ma‘naviyat, taraqqiyot, inson kapitali.

Kirish

Har qanday davlatning bugungi taraqqiyoti va ertangi istiqbolini belgilab beradigan eng muhim omillardan biri — bu yosh avlodning bilim va salohiyati, dunyoqarashi, tashabbuskorligi hamda jamiyat hayotidagi faol ishtirokidir. Yoshlar — nafaqat mamlakatning kelajagi, balki uning bugungi ijtimoiy-iqtisodiy va siyosiy taraqqiyotini ta‘minlayotgan faol kuchdir. Bugungi globallashuv va raqamli transformatsiya sharoitida dunyo davlatlari o‘rtasidagi raqobat tobora ko‘proq inson kapitali, ilmiy salohiyat, texnologik innovatsiyalar va kreativ tafakkurga bog‘liq bo‘lib bormoqda. Bunday sharoitda yoshlarning zamonaviy bilimlarni egallashi, xorijiy tillarni o‘rganishi, raqamli texnologiyalardan samarali foydalanishi, ilmiy izlanish va tadbirkorlik bilan shug‘ullanishi mamlakat taraqqiyotining muhim shartiga aylanmoqda. Yangi O‘zbekistonni barpo etish jarayonida yosh avlodning bilimli, vatanparvar, zamonaviy fikrleydigan, mustaqil qaror qabul qila oladigan va jamiyat oldidagi mas‘uliyatini chuqur anglaydigan shaxslar sifatida shakllanishiga



alohida e'tibor qaratilmoqda. Bu esa yoshlar siyosatini davlat taraqqiyotining ustuvor yo'nalishlaridan biriga aylantirmoqda.

Yoshlar — inson kapitalining eng muhim tarkibiy qismi

Mamlakat taraqqiyotini faqat tabiiy resurslar, ishlab chiqarish quvvatlari yoki moddiy boyliklar bilan belgilab bo'lmaydi.

Zamonaviy iqtisodiyotda asosiy ustunlikni bilim, malaka, tajriba va ijodkorlikka ega bo'lgan inson kapitali yaratadi. Yoshlar esa inson kapitalining eng faol va istiqbolli qatlamidir. Ularning yangi bilimlarni tez o'zlashtirishi, zamonaviy texnologiyalarga moslashuvchanligi, yangicha fikrlashi va tashabbus ko'rsatishga intilishi jamiyatning innovatsion rivojlanishiga katta imkoniyat yaratadi. Shu sababli yoshlarning ta'lim olishi, kasbiy ko'nikmalarni egallashi, ilmiy faoliyat bilan shug'ullanishi va o'z salohiyatini namoyon etishi uchun qulay sharoit yaratish oddiy ijtimoiy vazifa emas, balki mamlakatning uzoq muddatli strategik manfaatidir. Bugun ta'lim olgan yosh mutaxassis ertaga iqtisodiyotning muayyan tarmog'ida yangi texnologiyalarni joriy etishi, ilmiy kashfiyot qilishi, yangi ish o'rinlari yaratishi yoki ijtimoiy muammolarga innovatsion yechim taklif qilishi mumkin. Demak, yoshlar uchun yaratilayotgan har bir imkoniyat aslida mamlakat kelajagiga kiritilayotgan investitsiyadir.

Ta'lim — yoshlar salohiyatini ro'yobga chiqarishning asosiy omili

Yoshlarning strategik kuchga aylanishida, avvalo, sifatli ta'lim hal qiluvchi ahamiyatga ega. Chunki bilimli va malakali avlodgina mamlakat oldida turgan murakkab vazifalarni zamonaviy yondashuvlar asosida hal eta oladi. Yangi O'zbekistonda oliy ta'lim tizimini rivojlantirish, yoshlarning oliy ta'lim bilan qamrovini kengaytirish, ta'lim sifatini oshirish, xalqaro hamkorlikni rivojlantirish, zamonaviy mutaxassisliklar bo'yicha kadrlar tayyorlash va ilm-fan bilan ta'lim integratsiyasini kuchaytirishga katta e'tibor berilmoqda.

Biroq ta'limning vazifasi faqat diplom berish bilan cheklanib qolmasligi kerak. Zamonaviy ta'lim yoshga mustaqil fikrlash, muammoni tahlil qilish, jamoada ishlash, kreativ yondashish, axborotni tanqidiy baholash va amaliy natija yaratish ko'nikmalarini ham berishi zarur. Shu nuqtayi nazardan, yoshlarning ta'lim jarayonidagi faolligi nihoyatda muhim. Talaba faqat auditoriyada bilim oluvchi emas, balki ilmiy tadqiqotchi, loyiha muallifi, ijtimoiy tashabbuskor va kelajakdagi mutaxassis sifatida o'zini namoyon etishi lozim.

Ilm-fan va innovatsiya — yoshlar uchun yangi imkoniyatlar maydoni

Bugungi dunyoda davlatlarning raqobatbardoshligi bevosita ilm-fan va innovatsion rivojlanish darajasiga bog'liq. Shu sababli yoshlarni ilmiy faoliyatga keng jalb etish mamlakat taraqqiyotining muhim shartlaridan biridir. Yosh tadqiqotchilar



tomonidan ilgari surilayotgan ilmiy g'oyalar, texnologik ishlanmalar va innovatsion loyihalar iqtisodiyotning turli sohalarida yangi imkoniyatlarni yuzaga keltirishi mumkin. Ayniqsa, sun'iy intellekt, axborot texnologiyalari, biotexnologiya, muhandislik, yashil energetika, raqamli iqtisodiyot, kreativ industriya kabi yo'nalishlarda yoshlarning faolligi kelajak uchun katta ahamiyat

kasb etadi.

Yosh olimlarni ilmiy loyihalarga jalb etish, xalqaro ilmiy hamkorlikni kengaytirish, startaplarni qo'llab-quvvatlash, ilmiy ishlanmalarni amaliyotga joriy etish mexanizmlarini takomillashtirish orqali yoshlarning ilmiy salohiyatidan yanada samarali foydalanish mumkin. Bunda eng muhim vazifa — yoshning g'oyasini faqat tinglash emas, balki uni amaliy loyihaga aylantirish uchun zarur sharoit yaratishdir.

Yoshlar tadbirkorligi — iqtisodiy taraqqiyotning muhim drayveri

Yoshlarning iqtisodiy faolligini oshirish mamlakatda yangi ish o'rinlarini yaratish, innovatsion bizneslarni rivojlantirish va aholi farovonligini yuksaltirishga xizmat qiladi. Bugungi yoshlar orasida xizmat ko'rsatish, IT, elektron tijorat, ta'lim, dizayn, media, turizm, hunarmandchilik va boshqa sohalarda o'z biznesini boshlashga intilayotganlar ko'paymoqda. Yosh tadbirkorni qo'llab-quvvatlash faqat moliyaviy yordam ko'rsatishdan iborat bo'lmazligi kerak. Unga biznes-reja tuzish, marketing, moliyaviy savodxonlik, huquqiy masalalar, raqamli vositalardan foydalanish va bozorni o'rganish bo'yicha bilim va ko'nikmalar berish ham muhim. Shuningdek, yoshlarning kichik loyihalarini bosqichma-bosqich rivojlantirib, ularni barqaror biznes subyektlariga aylantirish uchun mentorlik va maslahat tizimini kuchaytirish zarur.

Raqamli avlod — yangi taraqqiyot modeli

Bugungi yoshlar raqamli texnologiyalar muhitida ulg'aymoqda. Internet, sun'iy intellekt, raqamli ta'lim platformalari va elektron xizmatlar yoshlarning bilim olish, ishlash va muloqot qilish usullarini tubdan o'zgartirmoqda. Raqamli savodxonlik endilikda qo'shimcha ko'nikma emas, balki zamonaviy inson uchun zarur kompetensiyaga aylanmoqda. Yoshlarning raqamli texnologiyalardan faqat iste'molchi sifatida emas, balki yaratuvchi sifatida foydalanishi muhim. Ya'ni yoshlar dasturiy mahsulotlar, raqamli xizmatlar, ta'limiy platformalar, media mahsulotlar va innovatsion yechimlarni ishlab chiqishga intilishi kerak. Sun'iy intellektning jadal rivojlanishi esa yoshlar oldiga yangi vazifalarni qo'ymoqda. Kelajak mutaxassisi texnologiyadan qo'rqmasligi, aksincha, undan samarali



foydalanish, yangi bilimlarni o'zlashtirish va texnologik o'zgarishlarga moslashish qobiliyatiga ega bo'lishi lozim.

Yoshlarning ma'naviy va fuqarolik mas'uliyati

Yoshlarning taraqqiyotdagi o'rni faqat iqtisodiy yoki ilmiy ko'rsatkichlar bilan belgilanmaydi. Ularning ma'naviy dunyosi, Vatanga munosabati, tarixiy xotirasi, milliy qadriyatlarga hurmati va fuqarolik mas'uliyati ham katta ahamiyatga ega. Yangi O'zbekistonni barpo etish jarayonida zamonaviy bilimga ega, shu bilan birga, milliy o'zligini anglagan va jamiyat manfaatlarini shaxsiy manfaatlari bilan uyg'unlashtira oladigan yoshlarni tarbiyalash muhimdir. Ma'naviy barkamol yosh turli axborot oqimlari orasida to'g'ri yo'l tanlay oladi, yot g'oyalarga tanqidiy munosabatda bo'ladi va jamiyat rivojiga daxldorlik hissi bilan yashaydi. Shu sababli ta'lim muassasalari, oila, mahalla, jamoat tashkilotlari va davlat institutlarining yoshlar tarbiyasidagi hamkorligini yanada kuchaytirish lozim.

Yoshlar siyosatining yangi bosqichi: imkoniyatdan natijaga

Yoshlar uchun imkoniyat yaratish — muhim qadam. Ammo eng asosiy masala ushbu imkoniyatlardan real natija olishdir. Bugungi yoshga grant, stipendiya, ta'lim, tanlov, loyiha, startap yoki xorijiy tajriba kabi imkoniyatlar berilar ekan, uning keyingi rivojlanish bosqichi ham qo'llab-quvvatlanishi zarur. Shu jihatdan yoshlar siyosatida quyidagi yondashuvlarni kuchaytirish maqsadga muvofiq:

- yoshlarning qiziqishi va qobiliyatini erta aniqlash;
- ta'lim va mehnat bozori o'rtasidagi uzviy aloqani kuchaytirish;
- talabalar va yosh mutaxassislarini ilmiy-tadqiqot faoliyatiga keng jalb etish;
- yoshlar tadbirkorligi uchun mentorlik va konsultativ xizmatlarni rivojlantirish;
- iqtidorli yoshlarni xalqaro ta'lim va ilmiy dasturlarga tayyorlash;
- raqamli va xorijiy til kompetensiyalarini rivojlantirish;
- yoshlarning innovatsion loyihalarini amaliyotga joriy etish;
- yoshlar tashabbuslarini hududlar kesimida qo'llab-quvvatlash;
- yosh mutaxassislar uchun munosib mehnat sharoitlarini yaratish.

Bu yondashuv yoshlarni davlat siyosatining oddiy obyekti emas, balki mamlakat taraqqiyotining faol subyekti sifatida shakllantirishga xizmat qiladi.

Yoshlarning xalqaro maydondagi ishtiroki

Globalashuv sharoitida yoshlarning xalqaro maydondagi faolligi ham mamlakatning ijobiy imijini shakllantirishda muhim omildir. Xalqaro olimpiadalar, ilmiy konferensiyalar, talabalar tanlovlari, akademik almashinuv dasturlari va xalqaro loyihalarda ishtirok etayotgan yoshlar mamlakatning intellektual salohiyatini namoyon etadi. Xorijiy tillarni biladigan, turli madaniyatlarni



tushunadigan va xalqaro muloqotga kirisha oladigan yoshlar O'zbekistonning xalqaro aloqalarini mustahkamlashda ham muhim rol o'ynaydi. Shu ma'noda, yoshlarning xalqaro tajribasini kengaytirish faqat individual rivojlanish emas, balki milliy taraqqiyot uchun ham strategik ahamiyatga ega.

Yoshlar — o'zgarishlarning faol ishtirokchisi

Bugungi yoshlar mamlakatdagi islohotlarni kuzatuvchi emas, balki ularning faol ishtirokchisi bo'lishi kerak. Har bir yosh o'z sohasida kichik bo'lsa-da, foydali tashabbus bilan chiqishi mumkin. Kimdir ilmiy maqola yozadi, boshqasi startap yaratadi, yana biri ijtimoiy loyiha amalga oshiradi, boshqa bir yosh esa ta'lim, madaniyat yoki texnologiya sohasida yangi g'oya ilgari suradi. Taraqqiyot aynan ana shunday kichik tashabbuslarning jamlanmasidan shakllanadi. Shuning uchun yoshlarni "kelajak bunyodkorlari" deb atash bilan cheklanib qolmasdan, ularning bugungi kundagi imkoniyatlarini kengaytirish, fikrlarini tinglash va tashabbuslarini qo'llab-quvvatlash muhim.

Xulosa

Xulosa qilib aytganda, yoshlar — Yangi O'zbekiston taraqqiyotining eng katta strategik resursi va harakatlantiruvchi kuchidir. Mamlakatning kelajakdagi iqtisodiy qudrati, ilmiy salohiyati, texnologik rivojlanishi va xalqaro maydondagi nufuzi ko'p jihatdan bugungi yoshlarning qanday bilim va ko'nikmalarga ega bo'lishi, qanday qadriyatlar asosida tarbiyalanishi hamda jamiyat hayotida qanchalik faol ishtirok etishiga bog'liq. Yoshlarni qo'llab-quvvatlashga yo'naltirilgan siyosatning bosh maqsadi nafaqat ularga imkoniyat yaratish, balki ushbu imkoniyatlardan foydalanish uchun zarur bilim, ko'nikma va muhitni shakllantirishdan iborat bo'lishi kerak. Ta'lim, ilm-fan, innovatsiya, tadbirkorlik, raqamli texnologiyalar va ma'naviyat yo'nalishlarining o'zaro uyg'unligi yoshlarning har tomonlama rivojlanishiga zamin yaratadi.

Eng muhimi, yosh avlod o'z kuchi, bilimi va tashabbusi bilan mamlakat taraqqiyotiga munosib hissa qo'shishi uchun o'zida mas'uliyat hissini shakllantirishi lozim. Chunki Yangi O'zbekistonning kelajagi faqat davlat tomonidan yaratilayotgan imkoniyatlarga emas, balki ana shu imkoniyatlardan oqilona foydalanib, ularni aniq natijaga aylantira oladigan yoshlarning salohiyatiga ham bog'liq. Demak, yoshlarni qo'llab-quvvatlash — kelajakni kutish emas, balki bugunning o'zida taraqqiyot poydevorini mustahkamlashdir. Bilimli, tashabbuskor, vatanparvar va zamonaviy fikrlaydigan yoshlar qancha ko'p bo'lsa, Yangi O'zbekistonning taraqqiyot sur'ati ham shuncha yuqori bo'ladi.



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