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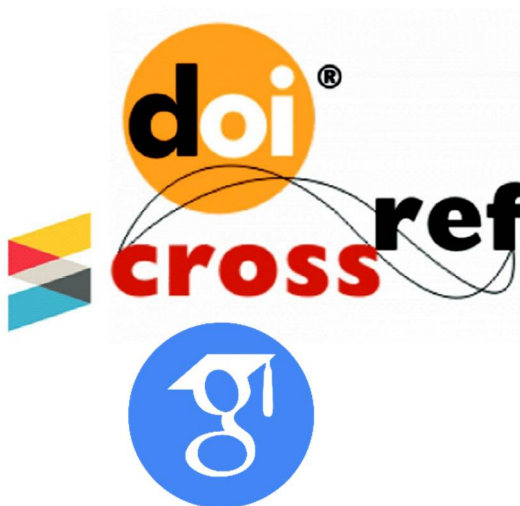
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БИОМЕДИЦИНА ВА АМАЛИЁТ ЖУРНАЛИ

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ASSESSMENT OF THE RELATIONSHIP BETWEEN BLOOD BIOCHEMICAL PARAMETERS, COGNITIVE AND PSYCHOEMOTIONAL IMPAIRMENTS, AND REHABILITATION EFFECTIVENESS IN PATIENTS WITH CHEMICAL ADDICTIONS

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ANNOTATION

Purpose: To determine the relationship between blood biochemical parameters (glucose, liver enzymes - ALT/AST, total bilirubin, and cholesterol) and cognitive and psychoemotional status, as well as rehabilitation effectiveness in patients with chemical addictions.

Materials and Methods: The study was conducted in 2025-2026 at the Samarkand regional branch of the Republican Specialized Scientific and Practical Center for Mental Health. A total of 200 patients diagnosed with “psychoactive substance dependence” were examined using clinical and psychometric assessments. Cognitive functions were evaluated with the MoCA test, and psychoemotional status with the Beck Depression Inventory and Spielberger-Khanin tests. Blood biochemical parameters (glucose, ALT/AST, total bilirubin, and cholesterol) were measured in laboratory conditions.

Results: Mean blood parameters were: glucose $5,8 \pm 0,9$ mmol/L, ALT 42 ± 12 U/L, AST 38 ± 10 U/L, total bilirubin $18,5 \pm 5,2$ mmol/L, and cholesterol $5,4 \pm 0,8$ mmol/L. Patients with elevated glucose and liver enzyme levels showed lower MoCA scores (glucose $r = -0,31$, ALT $r = -0,33$, AST $r = -0,29$, $p < 0,05$). Depressive symptoms in patients with ALT > 45 U/L averaged 21.3 ± 4.7 and were also correlated with glucose levels ($r = -0,28$, $p < 0,05$). During rehabilitation, patients whose biochemical parameters approached normal demonstrated significant improvement in cognitive and psychoemotional functions.

Conclusion: Elevated glucose and liver enzyme levels are associated with cognitive decline and increased depressive-anxiety symptoms. These findings emphasize the importance of individualized rehabilitation programs based on the patient's metabolic profile.

Keywords: chemical addictions, psychoactive substances, dependence, glucose, liver enzymes (ALT/AST), total bilirubin, cholesterol, cognitive status, psychoemotional status, rehabilitation.

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**KIMYOVIIY ADDIKTIV BUZILISHLARDA QON BIOKIMYOVIIY
KO'RSATKICHLARINING KOGNITIV VA PSIXOEMOTSIONAL BUZILISHLAR
HAMDA REABILITATSIYA SAMARADORLIGI BILAN O'ZARO BOG'LIQLIGINI
BAHOLASH**

ANNOTATSIYA

Maqsad: Kimyoviy addiktiv buzilishlari mavjud bemorlarda qon biokimyoviy ko'rsatkichlar (glyukoza, jigar fermentlari - ALT/AST, umumiy bilirubin va xolesterin) bilan kognitiv va psixoemotsional holat hamda reabilitatsiya samaradorligi o'rtasidagi o'zaro bog'liqlikni aniqlash.

Materiallar va usullar: Tadqiqot 2025-2026-yillarda Respublika ixtisoslashtirilgan ruhiy salomatlik ilmiy-amaliy tibbiyot markazining Samarqand viloyati filialida o'tkazildi. Klinik va psixometrik baholash asosida "psixoaktiv moddalarga qaramlik" tashxisi qo'yilgan 200 nafar bemor o'rganildi. Kognitiv funksiyalar MoCA testi, psixoemotsional holat Beck depressiya shkalasi va Spielberger-Xanin testlari yordamida baholandi. Qon biokimyoviy ko'rsatkichlar laboratoriya sharoitida aniqlanib, glyukoza, ALT/AST, umumiy bilirubin va xolesterin darajalari qayd etildi.

Natijalar: Tadqiqot natijalariga ko'ra, glyukoza darajasi o'rtacha $5,8 \pm 0,9$ mmol/l, ALT 42 ± 12 U/L, AST 38 ± 10 U/L, umumiy bilirubin $18,5 \pm 5,2$ mmol/l va xolesterin $5,4 \pm 0,8$ mmol/l ni tashkil qilgan. Glyukoza va jigar fermentlari darajalari yuqori bo'lgan bemorlar MoCA testi bo'yicha pastroq ballar ko'rsatgan (glyukoza $r = -0,31$, ALT $r = -0,33$, AST $r = -0,29$, $p < 0,05$). Depressiv simptomlar ALT > 45 U/L bo'lgan bemorlarda $21,3 \pm 4,7$ ga teng bo'lib, glyukoza darajasi bilan ham bog'liq edi ($r = -0,28$, $p < 0,05$). Reabilitatsiya jarayonida qon biokimyoviy ko'rsatkichlar me'yorga yaqinlashgan bemorlar kognitiv va psixoemotsional funksiyalarni sezilarli darajada tiklagan.

Xulosa: Glyukoza va jigar fermentlari darajalari yuqori bo'lgan bemorlarda kognitiv pasayish va depressiv-xavotir simptomlari kuchaygan. Ushbu natijalar individual metabolik profil asosida reabilitatsiya dasturini shakllantirish va samaradorligini oshirishda muhim ahamiyatga ega.

Kalit so'zlar: kimyoviy addiktiv buzilish, psixoaktiv modda, qaramlik, glyukoza, jigar fermentlari (ALT/AST), umumiy bilirubin, xolesterin, kognitiv holat, psixoemotsional holat, reabilitatsiya.

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**ОЦЕНКА ВЗАИМОСВЯЗИ БИОХИМИЧЕСКИХ ПОКАЗАТЕЛЕЙ КРОВИ С
КОГНИТИВНЫМИ И ПСИХОЭМОЦИОНАЛЬНЫМИ НАРУШЕНИЯМИ И
ЭФФЕКТИВНОСТЬЮ РЕАБИЛИТАЦИИ У ПАЦИЕНТОВ С ХИМИЧЕСКИМИ
АДДИКЦИЯМИ**

АННОТАЦИЯ

Цель исследования: Определить взаимосвязь между биохимическими показателями крови (глюкоза, печёночные ферменты - АЛТ/АСТ, общий билирубин и холестерин) и когнитивным,

психоэмоциональным состоянием, а также эффективностью реабилитации у пациентов с химическими аддикциями.

Материалы и методы: Исследование проводилось в 2025-2026 гг. на базе филиала Самаркандской области Республиканского специализированного научно-практического центра психического здоровья. Были обследованы 200 пациентов с диагнозом «зависимость от психоактивных веществ» с использованием клинических и психометрических методов. Когнитивные функции оценивались с помощью теста МоСА, психоэмоциональное состояние - по шкале депрессии Бека и тесту Шпильберга-Ханина. Биохимические показатели крови (глюкоза, АЛТ/АСТ, общий билирубин и холестерин) определялись лабораторно.

Результаты: Средние значения показателей крови составили: глюкоза $5,8 \pm 0,9$ ммоль/л, АЛТ 42 ± 12 Ед/л, АСТ 38 ± 10 Ед/л, общий билирубин $18,5 \pm 5,2$ ммоль/л, холестерин $5,4 \pm 0,8$ ммоль/л. У пациентов с повышенными уровнями глюкозы и печёночных ферментов наблюдались более низкие показатели МоСА (глюкоза $r = -0,31$, АЛТ $r = -0,33$, АСТ $r = -0,29$, $p < 0,05$). Депрессивные симптомы у пациентов с АЛТ > 45 Ед/л составляли $21,3 \pm 4,7$ и также были связаны с уровнем глюкозы ($r = -0,28$, $p < 0,05$). В ходе реабилитации пациенты с нормализацией биохимических показателей демонстрировали значительное улучшение когнитивных и психоэмоциональных функций.

Вывод: Повышенные уровни глюкозы и печёночных ферментов ассоциируются с когнитивными нарушениями и усилением депрессивно-тревожных симптомов. Результаты подчеркивают важность индивидуальной коррекции реабилитационных программ на основе метаболического профиля пациента.

Ключевые слова: химические аддикции, психоактивные вещества, зависимость, глюкоза, печёночные ферменты (АЛТ/АСТ), общий билирубин, холестерин, когнитивное состояние, психоэмоциональное состояние, реабилитация.

Kirish. So‘nggi yillarda kimyoviy addiktiv buzilishlar global miqyosda dolzarb tibbiy-ijtimoiy muammo sifatida e‘tirof etilmoqda [1]. Psixoaktiv moddalarni uzoq muddat iste‘mol qilish natijasida bemorlarda nafaqat somatik, balki kognitiv va psixoemotsional buzilishlar ham rivojlanadi [2]. Xotira, diqqat, ijro funksiyalari, qaror qabul qilish qobiliyati va muvofiqlik kabi kognitiv jarayonlarning pasayishi, shuningdek, depressiv va tashvishli holatlarning ortishi bemorlarning ijtimoiy moslashuv darajasini keskin yomonlashtiradi [3]. Bu esa ularning kundalik faoliyati, ish va o‘qishdagi samaradorligi, shuningdek, reabilitatsiya jarayonidagi muvaffaqiyatini sezilarli darajada pasaytiradi.

Zamonaviy tadqiqotlar shuni ko‘rsatadiki, kimyoviy addiktiv buzilishlar markaziy asab tizimining strukturaviy va funksional o‘zgarishlari bilan kechadi [4]. Ushbu o‘zgarishlar neyrokognitiv yetishmovchiliklarning shakllanishiga olib keladi, jumladan, diqqatni jamlay olmaslik, xotira pasayishi va ijro funksiyalaridagi buzilishlar kuzatiladi. Shu bilan birga, psixoaktiv moddalar bilan bog‘liq buzilishlar ko‘pincha affektiv spektrdagi kasalliklar, jumladan depressiya va tashvish buzilishlari bilan ham birga kechadi [5]. Natijada bemorlarning hayot sifati pasayadi, ijtimoiy faolligi cheklanadi va reabilitatsiya samaradorligi kamayadi.

Addiktiv buzilishlarning patogeneza metabolik o‘zgarishlar ham muhim o‘rin tutadi [6]. Psixoaktiv moddalar organizmda uglevod, yog‘ va oqsil almashinuviga ta‘sir ko‘rsatib, metabolik disbalansni yuzaga keltiradi. Natijada qon biokimyoviy ko‘rsatkichlar, xususan glyukoza, АЛТ/АСТ, umumiy bilirubin va xolesterin darajalari o‘zgaradi. Ushbu ko‘rsatkichlar bemorlarning energetik holatini, jigar va umumiy metabolik statusini aks ettiruvchi muhim laborator indikatorlar sifatida klinik amaliyotda keng qo‘llaniladi [7].

Shuningdek, metabolik disbalans markaziy asab tizimining faoliyati bilan bevosita bog‘liq bo‘lib, energiya yetishmovchiligi, oksidativ stress va neyromediatorlar muvozanatining buzilishi kognitiv va psixoemotsional funksiyalarga salbiy ta‘sir ko‘rsatadi. Glyukoza darajasining o‘zgarishi va jigar fermentlaridagi (АЛТ/АСТ) ko‘rsatkichlar, shuningdek bilirubin va xolesterin darajasi bemorlarning depressiv va tashvishli holatlari bilan bevosita bog‘liq bo‘lishi mumkin. Shu bilan

birga, ushbu ko'rsatkichlar reabilitatsiya jarayonidagi tiklanish sur'ati va samaradorligini baholashda qo'llanilishi mumkin [8].

Ushbu holat tadqiqotlarda yangi klinik va laborator indikatorlar yordamida bemorlarning holatini monitoring qilish, erta tashxis qo'yish va reabilitatsiya samaradorligini oshirish imkoniyatlarini yaratadi. Shu bois, qon biokimyoviy ko'rsatkichlar, kognitiv va psixoemotsional buzilishlar hamda reabilitatsiya samaradorligi o'rtasidagi bog'liqlikni o'rganish zamonaviy tibbiyot va narkologiya sohasida katta ilmiy ahamiyatga ega.

Tadqiqot maqsadi. Ushbu tadqiqotning maqsadi kimyoviy addiktiv buzilishlarda qon biokimyoviy ko'rsatkichlar (glyukoza, ALT/AST, umumiy bilirubin va xolesterin) bilan bemorlarning kognitiv va psixoemotsional holati hamda reabilitatsiya samaradorligi o'rtasidagi o'zaro bog'liqlikni aniqlashdir.

Materiallar va tadqiqot usullari. Tadqiqot 2025-2026-yillar davomida Respublika ixtisoslashtirilgan ruhiy salomatlik ilmiy-amaliy tibbiyot markazining narkologiya xizmati bo'yicha Samarqand viloyati filiali shifoxonasi bazasida o'tkazilgan bo'lib, buning uchun "psixoaktiv moddalarga qaramlik" tashxisi qo'yilgan 200 nafar bemor klinik tahlil va psixometrik baholash asosida o'rganildi.

Tadqiqot doirasida bemorlarning demografik ko'rsatkichlari (yoshi, jinsi, ijtimoiy holati), klinik xususiyatlari va reabilitatsiya jarayoni kuzatildi. Bemorlar kognitiv funksiyalarini baholash uchun MoCA (Montreal Cognitive Assessment) testi, psixoemotsional holatini aniqlash uchun Beck depressiya shkalasi va Spielberger–Xanin testlaridan foydalangan.

Qon biokimyoviy ko'rsatkichlar sifatida glyukoza, ALT/AST, umumiy bilirubin va xolesterin darajalari laboratoriya sharoitida aniqlangan.

Statistik tahlil uchun SPSS 26.0 dasturi ishlatilgan. Bemorlar guruhlarini o'rtasidagi farqlarni aniqlashda t-test va Mann-Whitney testlari, o'zaro bog'liqliklarni baholashda Spearman va Pearson korrelyatsiya tahlillaridan foydalanilgan. Natijalar $p < 0,05$ darajada statistik ahamiyatli deb hisoblangan.

Tadqiqotning natijalari. Tadqiqotga jalb qilingan 200 nafar psixoaktiv moddalarga qaram bemorlarning demografik va klinik xususiyatlari tahlil qilindi. Bemorlarning o'rtacha yoshi $34,6 \pm 8,2$ yoshni tashkil qilgan. Bemorlarning ko'pchiligi (65%) reabilitatsiya jarayonida birinchi marta qatnashgan, qolgan 35% esa qayta davolanishi zarur bo'lgan bemorlardan iborat edi.

Qon biokimyoviy ko'rsatkichlar o'rganilganda glyukoza darajasi o'rtacha $5,8 \pm 0,9$ mmol/l, ALT 42 ± 12 U/L, AST 38 ± 10 U/L, umumiy bilirubin $18,5 \pm 5,2$ mmol/l, xolesterin esa $5,4 \pm 0,8$ mmol/l ni tashkil qilgan. Glyukoza darajasi me'yordan yuqori bemorlar 35% ni, ALT >45 U/L bemorlar 28% ni, AST >40 U/L bemorlar 30% ni, xolesterin $>5,2$ mmol/l bemorlar 26% ni tashkil qilgan.

Kognitiv funksiyalar MoCA testi yordamida baholangan. Tadqiqot natijalariga ko'ra, bemorlarning 64% da yengil yoki o'rta darajadagi kognitiv pasayish kuzatilgan. Glyukoza darajasi yuqori bo'lgan bemorlarda MoCA ko'rsatkichlari sezilarli darajada past bo'lib, glyukoza va kognitiv pasayish o'rtasida $r = -0,31$, $p < 0,05$ bilan statistika jihatdan ahamiyatli bog'liqlik aniqlangan. ALT va AST darajalari oshishi bilan kognitiv pasayish ham ijobiy korrelyatsiya qilgan (ALT $r = -0,33$; AST $r = -0,29$, $p < 0,05$), ya'ni jigar fermentlari darajasi yuqori bo'lgan bemorlar kognitiv funksiyalarda sezilarli darajada pasayish ko'rsatgan. Umumiy bilirubin darajasi ham MoCA ballari bilan $r = -0,27$, $p < 0,05$ darajada bog'liq bo'lib, bu jigar funksiyasi va neyrokognitiv holat o'rtasidagi aloqani tasdiqlaydi.

Jadval 1.

Qon biokimyoviy ko'rsatkichlar va MoCA testi natijalari bilan bog'liqligi

Ko'rsatkich	O'rtacha $\pm$ SD	Me'yordan yuqori bemorlar (%)	MoCA bilan korrelyatsiya (r)	p
Glyukoza (mmol/l)	$5,8 \pm 0,9$	35%	-0,31	$<0,05$
ALT (U/L)	42 ± 12	28%	-0,33	$<0,05$
AST (U/L)	38 ± 10	30%	-0,29	$<0,05$
Umumiy bilirubin (μ mol/l)	$18,5 \pm 5,2$	-	-0,27	$<0,05$

Xolesterin (mmol/l)	5,4 ± 0,8	26%	-	-
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Izoh: Jadvalda keltirilgan korrelyatsiya koeffitsiyentlari bemorlarning glyukoza, jigar fermentlari va umumiy bilirubin darajalari bilan kognitiv pasayish (MoCA testi) o'rtasidagi bog'liqlikni aks ettiradi.

Psixoemotsional holatni baholashda Beck depressiya shkalasi va Spielberger-Xanin testlari qo'llanilgan. Tadqiqot natijalariga ko'ra, depressiv simptomlar glyukoza va jigar fermentlari darajasi bilan ijobiy bog'liq bo'lgan ($p < 0,05$). Masalan, ALT >45 U/L bo'lgan bemorlar orasida depressiya ballari o'rtacha $21,3 \pm 4,7$ ga teng bo'lib, bu past glyukoza darajasi bilan ham bog'liq edi ($r = -0,28$, $p < 0,05$). Tashvish darajasi ham glyukoza, ALT va AST darajalarining oshishi bilan ortgan, bu psixoaktiv moddalar qabul qiluvchi bemorlar holatida stressga chidamlilikning pasayishini ko'rsatadi.

Jadval 2.

Qon biokimyoviy ko'rsatkichlar va psixoemotsional holat bilan bog'liqligi

Ko'rsatkich	O'rtacha ± SD	Psixoemotsional holat bilan korrelyatsiya (r)	p	Izoh
Glyukoza (mmol/l)	5,8 ± 0,9	-0,28 (depressiya)	<0,05	Past glyukoza bilan depressiya ko'rsatkichlari ham bog'liq
ALT (U/L)	42 ± 12	+0,31 (depressiya)	<0,05	ALT >45 U/L bemorlarda depressiya ballari yuqori
AST (U/L)	38 ± 10	+0,29 (xavotir)	<0,05	AST oshishi bilan xavotir darajasi ortadi
Umumiy bilirubin (mmol/l)	18,5 ± 5,2	-	-	-
Xolesterin (mmol/l)	5,4 ± 0,8	-	-	-

Izoh: Jadvalda glyukoza, ALT va AST darajalari bilan depressiya va tashvish darajalari o'rtasidagi bog'liqlik ko'rsatilgan. R-manzili (korrelyatsiya koeffitsiyenti) va p-qadri statistik ahamiyatini bildiradi.

Reabilitatsiya jarayoni davomida qon biokimyoviy ko'rsatkichlar va bemorlarning tiklanish sur'ati o'rtasida ham bog'liqlik aniqlangan. Glyukoza, ALT, AST va xolesterin darajalari me'yorga yaqinlashganda bemorlarning reabilitatsiya samaradorligi oshgan. Masalan, glyukoza 5,0-5,5 mmol/l oralig'ida bo'lgan bemorlar reabilitatsiya davomida kognitiv va psixoemotsional funksiyalarni tezroq tiklagan (tiklanish ballari $85 \pm 7\%$), ALT va AST darajalari me'yordan oshgan bemorlarda esa tiklanish sekin kechgan ($p < 0,05$). Shu bilan birga, xolesterin va bilirubin darajasi me'yordan oshgan bemorlar reabilitatsiya jarayonida past samaradorlikni ko'rsatgan, bu esa metabolik disbalans va jigar funksiyasi buzilishi bilan bog'liq ekanligini ko'rsatadi.

Umuman olganda, tadqiqot natijalari shuni ko'rsatdiki, glyukoza, ALT/AST, umumiy bilirubin va xolesterin darajalari psixoaktiv moddalarga qaram bemorlarning kognitiv va psixoemotsional holati hamda reabilitatsiya samaradorligi bilan statistik jihatdan ahamiyatli bog'liqdir. Bu natijalar qon biokimyoviy ko'rsatkichlarni monitoring qilish orqali bemorlarni erta tashxislash, individual reabilitatsiya rejalarini ishlab chiqish va tiklanish jarayonini optimallashtirish imkoniyatini beradi.

Xulosa. Tadqiqot natijalari shuni ko'rsatdiki, kimyoviy addiktiv buzilishlarda qon biokimyoviy ko'rsatkichlar - glyukoza, jigar fermentlari (ALT, AST), umumiy bilirubin va xolesterin - kognitiv va psixoemotsional holat bilan sezilarli darajada bog'liqdir. Glyukoza darajasi me'yordan yuqori bo'lgan bemorlar MoCA testi bo'yicha pastroq ballar ko'rsatgan, shuningdek, depressiv va tashvish simptomlari kuchaygan. ALT va AST darajalari oshishi bilan kognitiv pasayish va psixoemotsional buzilishlar ortishi kuzatilgan. Ushbu natijalar qon biokimyoviy monitoringning nafaqat metabolik holatni baholash, balki kognitiv va psixoemotsional funksiyalarni prognoz qilishda

ham muhim ahamiyatga ega ekanligini ko'rsatadi. Shu bilan birga, bemorlarning individual metabolik profili asosida reabilitatsiya dasturini shakllantirish, davolash strategiyasini moslashtirish va reabilitatsiya samaradorligini oshirish imkonini beradi. Bu esa klinik amaliyotda psixoaktiv moddalar qabul qiluvchi bemorlar uchun kompleks yondashuvni rivojlantirishda yangi ilmiy asos yaratadi.

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