

TIBBIYOT



TA'LIMI & INNOVATSIYALARI



U.S. National Library of Medicine
National Institutes of Health

Advancing Health
Through Knowledge



- 14.00.00 - Tibbiyot fanlari;
- 14.00.01 - Akusherlik va ginekologiya;
- 14.00.02 - Morfologiya;
- 14.00.03 - Endokrinologiya;
- 14.00.04 - Otorinolaringologiya;
- 14.00.05 - Ichki kasalliklar;
- 14.00.06 - Kardiologiya;
- 14.00.07 - Gigiena;
- 14.00.08 - Oftal'mologiya;
- 14.00.09 - Pediatriya;
- 14.00.10 - Yuqumli kasalliklar;
- 14.00.11 - Dermatologiya va venerologiya;
- 14.00.12 - Tibbiy rehabilitologiya;
- 14.00.13 - Nevrologiya;
- 14.00.14 - Onkologiya;
- 14.00.15 - Patologik anatomiya;
- 14.00.16 - Normal va patologik fiziologiya;
- 14.00.17 - Farmakologiya va klinik farmakologiya;
- 14.00.18 - Psixiatriya va narkologiya;
- 14.00.19 - Klinik radiologiya;
- 14.00.20 - Tibbiy genetika;
- 14.00.21 - Stomatologiya;
- 14.00.22 - Travmatologiya va ortopediya;
- 14.00.23 - Hamshiralik ishini tashkil etish;
- 14.00.24 - Sud tibbiyoti;
- 14.00.27 - Xirurgiya;
- 14.00.28 - Neyroxirurgiya;
- 14.00.41 - Xalq tabobati;
- 14.00.35 - Bolalar xirurgiyasi;
- 14.00.34 - Yurak-qon tomir xirurgiyasi

№10-SON



2026-yil, oktabr

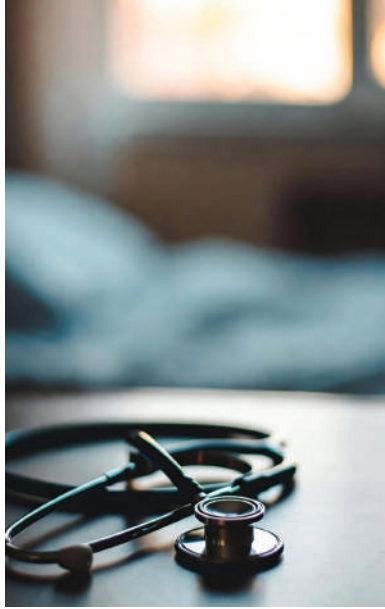


tibbiyot-talimi-va-innovatsiyalari.uz



https://t.me/tibbbiyot_2100

Litsenziya raqami: №745444



Tahrir hay'ati a'zolari:



BOSH MUHARRIR:

Shuhrat Baymuradov Abdujalilovich
tibbiyot fanlari doktori (DSc), professor



BOSH MUHARRIR O'RINBOSARI:

Iminov Komiljon Odiljonovich
tibbiyot fanlari bo'yicha falsafa doktori

“Tibbiyot ta'limi va innovatsiyalari” ilmiy elektron jurnali 29.04.2025-yildan O'zbekiston Respublikasi Prezidenti Adminstratsiyasi huzuridagi Axborot va ommaviy kommunikatsiyalar agentligi tomonidan C-5669801 reyestr raqami tartibi bo'yicha ro'yxatdan o'tkazilgan. Litsenziya raqami: №745444.

Tahrir hay'ati a'zolari:



Sharipov Kongratbay Avezimbetovich
Texnika fanlari doktori (DSc), professor



Ishanqulov Artiqboy Eshboyevich
Biologiya fanlari doktori (DSc), professor



Otamuradov Furqat Abdukarimovich
tibbiyot fanlari doktori (DSc), dotsent.



Shuxrat Jumayevich Teshayev
tibbiyot fanlari doktori (DSc), professor



Oral Aminovna Ataniyazova
tibbiyot fanlari doktori (DSc), professor



Jalolova Feruza Maxamatjanovna
Tibbiyot fanlari bo'yicha falsafa doktori (DSc), dotsent



Uraqov Shokir Ulashovich
tibbiyot fanlari doktori doktori (DSc)

Aripkhodjaeva Shakhzoda
resident doctor in national medical center

"TIBBIYOT TA'LIMI VA
INNOVATSIYALARI"
ilmiy elektron jurnali O'zbekiston
Respublikasi Axborot va ommaviy
kommunikatsiyalar agentligi
(AOKA) tomonidan 2024-yil
9-oktabrdan boshlab
c-5669651 raqami ostida rasmiy
ro'yxatdan o'tkazilgan.

Murojaat uchun telefon:
+998 97 748 70 03
Email: @munis_sm



MUNDARIJA

KARDIORENAL SAMARADORLIK NUQTAI NAZARIDAN FINERENON VA EPLERENONNING CHAP QORINCHA OTISH FRAKSIYASI SAQLANGAN YURAK YETISHMOVCHILIGI BEMORLARIDAGI QIYOSIY BAHOLANISHI.....	21
Qodirova Guljahon Ramazonovna, Tursunova Laylo Dilshatovna	
GIPERSPEKTRAL TASVIRLARNI TASNIFLASHDA FAZOVIIY SIZIB CHIQISH NIMANI O'LCAYDI? YAQINLIK, KO'RILMAGAN SINFLAR VA SINFLAR TARKIBIGA AJRATISH.....	27
Tuxtamurodov Nozir Ulmas o'g'li	
DIABETIK PANJA SINDROMINING JARROHLIK ASORATLARINI DAVOLASHDA YANGI YONDASHUVLAR.....	34
Akmaljon Olimov	
FARG'ONA VODIYSI SHAROITIDA GERIATRIK YOSHDAGI BEMORLARDA O'PKA VA EKSTRAPULMONAL SILNING KLINIK-EPIDEMIOLOGIK XUSUSIYATLARI (2020–2025).....	40
Maxsumova Dinora Kamolovna, Zuhridin Salohiddinovich Salohiddinov	
ANTIBIOTIKLARGA CHIDAMLI BAKTERIYALAR: ZAMONAVIY TIBBIYOT MUAMMOSI.....	46
Abdisamatova Sarviniso Adisamatovna	
EFFECTIVENESS OF TREATMENTS FOR CORONARY ARTERY DISEASE.....	50
Alfiya S. Shamsiddinova, Xursandbek A. Ergashaliyev, O'g'iloy M. Umaraliyeva, Ibrokhimjon M. Xursanov	
KARDIORENAL SINDROMDA GENETIK VA EPIGENETIK DETERMINANTLAR HAMDA OQSIL BIOMARKERLAR PANELI: INTEGRATSION DIAGNOSTIK YONDASHUV.....	55
Korakulova Zilola Tilovmurodovna, Tursunkulov Ortikali, Ahmedova Umida Maxmudovna	
ANDIJON VILOYATI AYOLLAR POPULYATSIYADA QALQONSIMON BEZ PATOLOGİYALARI FONIDA SUT BEZI SARATON VA SARATON OLDI HOLATLARINI UCHRASH CHASTOTASI.....	65
Mahmudjonova Sayyoraxon Shavkatbek qizi	
SURUNKALI TROMBOEMBOLIK O'PKA GIPERTENZIYASI: PATOGENEZDAN DAVOLASH STRATEGIYASINI TANLASHGACHA.....	70
Sunnatova Gulbahor Ismatovna, Tashinova Laylo Xolmurodovna, Ergasheva Nigora Utkurovna, Xolmirzayev Baxtiyor Turgunovich	
TISH OLINGANDAN KEYIN PRP QO'LLASHNING KLINIK SAMARADORLIGINI BAHOLASH.....	77
Muqimov Odiljon Axmadjonovich, Urinova Gulnoza Shuxrat qizi	
TISH PROTEZLARI, JAG' MODELLARI VA JARROHLIK SHABLONLARINI YARATISHDA 3D-BOSMADAN FOYDALANISH.....	84
Abduganiyeva Shaxista Xodjiyevna, Axmedov Lutfullo	
SPORTCHILARDA KORONAR ARTERIYA KASALLIGINI YENGIL SUN'IY INTELLEKT YORDAMIDA ERTA ANIQLASH.....	89
Muksimova Shahnoza Shamuhitovna, Umirzakova Sabina Totlibayevna, Isxakova Nargiza Patxillayevna	
ИЗУЧЕНИЕ ЭФФЕКТИВНОСТИ ИСПОЛЬЗОВАНИЯ МИКРОТОКОВОЙ ТЕРАПИИ В КОМПЛЕКСНОМ ЛЕЧЕНИИ ХРОНИЧЕСКОГО ГЕНЕРАЛИЗОВАННОГО ПАРОДОНТИТА У ПАЦИЕНТОВ С САХАРНЫМ ДИАБЕТОМ 2 ТИПА.....	103
Меджидов Меджид Нисрединович, Кафаров Ризван Тельманович, Тешабоев Мухаммадхё Гуломкодирович, Рахматуллаев Азизбек Ахмадулло угли	
ОТДАЛЁННЫЕ ОСЛОЖНЕНИЯ НЕКРОТИЧЕСКОГО ЭНТЕРОКОЛИТА НОВОРОЖДЁННЫХ ПРИ ПРИКРЫТОЙ ПЕРФОРАЦИИ УЧАСТКА ПОПЕРЕЧНОЙ ОБОДОЧНОЙ КИШКИ.....	122
Хамраев Абдурашид Журакулович, Акмалова Юлдуз Илхомовна, Каримов Итиёр Музаффарович	



ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ В ЧЕЛЮСТНО-ЛИЦЕВОЙ ХИРУРГИИ СОВРЕМЕННЫЕ ВОЗМОЖНОСТИ И УСЛОВИЯ КЛИНИЧЕСКОГО ПРИМЕНЕНИЯ	132
Шухратова Мафтуна Мухаммад-Али кизи	
РЕЗУЛЬТАТЫ ХИРУРГИЧЕСКОГО ЛЕЧЕНИЯ ВРОЖДЕННОГО ВЫВИХА БЕДРА У ДЕТЕЙ МЛАДШЕГО ВОЗРАСТА	139
Файзиматов Музаффар Азамович	
СОВРЕМЕННЫЕ ПОДХОДЫ К РЕКОНСТРУКТИВНЫМ ОПЕРАЦИЯМ ВЕРХНЕЙ И НИЖНЕЙ ЧЕЛЮСТИ.....	144
Шухратова Мафтуна Мухаммад-Али кизи	
ZRR VA AUTIZMLI BOLALARDA KOGNITIV-FUNKSIONAL REABILITATSIYADA MONTESSORI METODIKASINING O'RNI	152
Odilbekova Hurliqo, Kimsanboyeva Odina, Jahonboyeva Dilorom, Majidova Yoqutxon Nabievna	
ОТ ВАЛИДИРОВАННОЙ ЦИФРОВОЙ ПЛАТФОРМЫ ДЛЯ ОРТОГНАТИЧЕСКОЙ ХИРУРГИИ К БИОМЕХАНИЧЕСКОМУ МОДЕЛИРОВАНИЮ В РЕАЛЬНОМ ВРЕМЕНИ ПЕРСПЕКТИВЫ ГИБРИДНОГО РАСШИРЕНИЯ PINN И FEA ДЛЯ ЗУБОЧЕЛЮСТНОЙ СИСТЕМЫ	158
Шухратова Мафтуна Мухаммад-Али кизи	
ДОБРОКАЧЕСТВЕННЫЕ ЗАБОЛЕВАНИЯ МОЛОЧНОЙ ЖЕЛЕЗЫ В АСПЕКТЕ ОНКОЛОГИЧЕСКОЙ НАСТОРОЖЕННОСТИ: СОВРЕМЕННЫЕ АСПЕКТЫ ЭТИОЛОГИИ, ПАТОГЕНЕЗА И ДИАГНОСТИКИ.....	164
Набиева Шохсанам Кахрамон кизи	
SUBATROFIK RINITDA BURUN SHILLIQ QAVATINING KLINIK-FUNKSIONAL VA MIKROBIOLOGIK HOLATINI KOMPLEKS BAHOLASH ASOSIDA MAHALLIY TERAPIYANI TAKOMILLASHTIRISH	169
Yashnarova Lobar Eldor qizi	
BOLALARDA NUTQ RIVOJLANISHI BUZILISHLARINI KORREKSIYALASHDA FORBRAIN QURILMASINING O'RNI: ADABIYOTLAR SHARHI	173
Kimsanboyeva Odina Kozimovna, Odilbekova Hurliqo Ilhomovna, Jahonboyeva Dilorom Vohidjonovna, Huseynova Nadira Turgunovna	
SURUNKALI BUYRAK KASALLIGINING DIALIZ BOSQICHIDAGI BEMORLARDA NOS3 GENI T786C POLIMORFIZMINING YURAK-QON TOMIR ASORATLARI BILAN BOG'LIQLIGI	178
Eshmetova Sabohat Ilxomovna	
Jabbarov Ozimboy Otaxonovich	
Tursunova Laylo Dilshatovna	
BOLALARDA YUQORI NAFAS YO'LLARI TORAYISHI BILAN BOG'LIQ DISTAL OKKLYUZIYANI DAVOLASH USULLARINI TAKOMILLASHTIRISH.....	185
Tosheva Orzigul Karim qizi	
НЕЙРОМЫШЕЧНАЯ ДИСФУНКЦИЯ И БОЛЕВОЙ СИНДРОМ ПРИ ДЕКОМПЕНСИРОВАННОЙ СТИРАЕМОСТИ ЗУБОВ: ОЦЕНКА И ЭФФЕКТИВНОСТЬ ВОССТАНОВЛЕНИЯ ЗУБНЫХ РЯДОВ.....	189
Хаитбоева Мохирабону Уткир кизи	
Мухамедсаидова Ирода Абдувахоб кизи	
Хусанбаева Феруза Акмаловна	
BOSH MIYA QON AYLANISHINING O'TKIR BUZILISHIDA BRONX - O'PKA TIZIMI ASORATLARI RIVOJLANISHINING KLINIK-PATOGENETIK XUSUSIYATLARI	197
Ikromova Mufazzal Abdurashidovna	
СОВРЕМЕННЫЕ ПРЕДСТАВЛЕНИЯ О ФАРМАКОЛОГИЧЕСКИХ СВОЙСТВАХ И МЕХАНИЗМАХ ДЕЙСТВИЯ АДАПТОГЕННЫХ ЛЕКАРСТВЕННЫХ СРЕДСТВ.....	201
Ганиева Динара Шарофидиновна	



CHAYNOV TISHLARI OKKLYUZION YUZASINING RAQAMLI 3D-MORFOMETRIK XUSUSIYATLARI VA ULARNING OKKLYUZION BALANSI HAMDA CHAYNASH FUNKSIYASI BILAN BOG'LIQLIGI	209
Abdumutalipova Muborak Abdurashid qizi	
Rizayeva Sevara Mirgulyamovna	
DEVELOPMENT OF A SET OF INNOVATIVE PREVENTIVE MEASURES AIMED AT PREVENTING DISEASES OF HARD DENTAL TISSUES IN CHILDREN, TAKING INTO ACCOUNT THEIR AGE-RELATED CHARACTERISTICS BASED ON CLINICAL AND DIAGNOSTIC CRITERIA	215
Buriyeva N. A.	
BOLALARDA GIPERTROFIK GINGIVITNI DAVOLASH SAMARADORLIGINI KLINIK VA PERIODONTAL INDEKSLAR ASOSIDA BAHOLASH.....	219
Eshimova Sayyora Tursunovna	
RAS BO'LGAN BOLALARDA KOGNITIV BUZILISHLARNI KORREKSIYALASHDA MIKROTKLI REFLEKSOTERAPIYANING O'RNI: ADABIYOTLAR SHARHI	226
Jahonboyeva D.V	
Odilbekova H.I	
Kimsanboyeva O.K	
BARIATRIK JARROHLIK AMALIYOTI O'TKAZGAN BEMORLARDA PSIXOLOGIK REGRESS SHAKLLANISHINING O'ZIGA XOS XUSUSIYATLARI.....	232
Kuchkarov Humoyun Nurali o'g'li	
Yadgarova Nargiza Fahriddinovna	
COMORBIDITY PATTERNS AND THEIR ASSOCIATION WITH GALLSTONE DISEASE IN THE ELDERLY POPULATION: (A POPULATION-BASED STUDY IN THE FERGANA VALLEY, UZBEKISTAN).....	239
Usmonov Xusniddin Qutbidinovich	
Salakhidinov Sarvarjon Zaynabidinovich	



COMORBIDITY PATTERNS AND THEIR ASSOCIATION WITH GALLSTONE DISEASE IN THE ELDERLY POPULATION: (A POPULATION-BASED STUDY IN THE FERGANA VALLEY, UZBEKISTAN)

Usmonov Xusniddin Qutbidinovich

Andijan state medical institute, associate professor
of the department of general surgery and military field surgery

E-mail: usmonov4@mail.ru

ORCID: 0000-0002-4630-8436

Salakhidinov Sarvarjon Zaynabidinovich

Andijan state medical institute, associate professor of the department of general surgery and military field surgery, doctor of medical sciences (DSc), Uzbekistan

E-mail: Salakhidinov1972@mail.ru

Phone: +998 97-256-24-23

ORCID: 0000-0001-5164-7953

Abstract: Background. Gallstone disease (GSD) is one of the most prevalent disorders of the biliary system and represents an important clinical and public health problem, particularly in older adults. Age-related metabolic changes and the accumulation of chronic diseases may substantially modify the risk, clinical presentation, and course of GSD. The assessment of comorbidity patterns may therefore contribute to the earlier identification of high-risk individuals and the optimization of preventive strategies. Objective. To evaluate the structure of comorbid conditions and their association with gallstone disease among adults aged 60–75 years in the Fergana Valley of Uzbekistan. Materials and Methods. A population-based observational study was conducted among residents aged 60–75 years in Fergana, Uzbekistan. Epidemiological, clinical, laboratory, instrumental, and statistical methods were used. Information on demographic characteristics, metabolic risk factors, cardiovascular diseases, gastrointestinal and hepatobiliary disorders, respiratory diseases, renal disorders, and other chronic conditions was collected from clinical examinations, preventive screening data, and outpatient medical records. Statistical analysis included comparisons between study groups, assessment of categorical variables using the χ^2 test, calculation of relative risk (RR), 95% confidence intervals (95% CI), and significance levels. Results. The analysis demonstrated a substantial burden of concomitant chronic diseases among older individuals evaluated for gallstone disease. Cardiovascular, gastroenterological, and hepatobiliary comorbidities were among the most frequently identified accompanying conditions. In the comparative analysis, cardiovascular comorbidity was recorded in 17 individuals in the main group and 6 in the control group, gastroenterological comorbidity in 16 and 1, and hepatobiliary comorbidity in 21 and 9 individuals, respectively. Respiratory comorbidity was observed in 10 versus 2 individuals, whereas hematological comorbidity was detected in 2 versus 1. These findings indicate a clustering of chronic metabolic and organ-system disorders in individuals with gallstone disease and suggest an important relationship between multimorbidity and the clinical and epidemiological profile of GSD in older adults. Conclusion. Gallstone disease in adults aged 60–75 years is associated with a considerable burden of comorbid conditions, particularly cardiovascular, gastroenterological, and hepatobiliary disorders. Comprehensive assessment of comorbid conditions should be incorporated into risk stratification and preventive monitoring of older individuals with or at increased risk of gallstone disease.

Keywords: gallstone disease; cholelithiasis; comorbidity; multimorbidity; older adults; risk factors; metabolic disorders; epidemiology; Fergana Valley; Uzbekistan.

Аннотация: Актуальность. Желчнокаменная болезнь (ЖКБ) является одним из наиболее распространённых заболеваний билиарной системы и представляет собой важную клиническую и медико-социальную проблему, особенно среди лиц пожилого возраста. Возрастные метаболические изменения и накопление хронических заболеваний могут существенно влиять на риск развития ЖКБ, её клинические проявления и течение. Поэтому



оценка структуры коморбидных состояний может способствовать более раннему выявлению лиц с высоким риском и совершенствованию профилактических мероприятий. Цель. Оценить структуру сопутствующих заболеваний и их связь с желчнокаменной болезнью у лиц в возрасте 60–75 лет, проживающих в Ферганской долине Узбекистана. Материалы и методы. Проведено популяционное наблюдательное исследование среди жителей в возрасте 60–75 лет в городе Фергане, Узбекистан. Использовались эпидемиологические, клинические, лабораторные, инструментальные и статистические методы. Информация о демографических характеристиках, метаболических факторах риска, сердечно-сосудистых заболеваниях, патологии желудочно-кишечного тракта и гепатобилиарной системы, заболеваниях органов дыхания, почек и других хронических состояниях собиралась на основании клинических обследований, данных профилактических осмотров и амбулаторной медицинской документации. Статистический анализ включал сравнение исследуемых групп, оценку категориальных переменных с использованием критерия χ^2 , расчёт относительного риска (RR), 95% доверительных интервалов (95% ДИ) и уровней статистической значимости. Результаты. Анализ выявил значительную распространённость сопутствующих хронических заболеваний среди лиц пожилого возраста, обследованных по поводу желчнокаменной болезни. Наиболее часто выявлялись сердечно-сосудистые, гастроэнтерологические и гепатобилиарные коморбидные состояния. При сравнительном анализе сердечно-сосудистая коморбидность зарегистрирована у 17 человек в основной группе и у 6 — в контрольной группе, гастроэнтерологическая — у 16 и 1, гепатобилиарная — у 21 и 9 человек соответственно. Респираторная коморбидность наблюдалась у 10 и 2 человек, тогда как гематологическая — у 2 и 1 человека соответственно. Полученные результаты свидетельствуют о сочетании хронических метаболических нарушений и заболеваний различных органов и систем у лиц с желчнокаменной болезнью и указывают на важную связь между мультиморбидностью и клинико-эпидемиологическим профилем ЖКБ у пожилых людей. Заключение. Желчнокаменная болезнь у лиц в возрасте 60–75 лет сопровождается значительным бременем коморбидных состояний, прежде всего сердечно-сосудистыми, гастроэнтерологическими и гепатобилиарными заболеваниями. Комплексную оценку сопутствующей патологии следует включать в стратификацию риска и профилактическое наблюдение за лицами пожилого возраста с желчнокаменной болезнью или повышенным риском её развития.

Ключевые слова: желчнокаменная болезнь; холелитиаз; коморбидность; мультиморбидность; пожилые люди; факторы риска; метаболические нарушения; эпидемиология; Ферганская долина; Узбекистан.

Annotatsiya: Dolzarbligi. O't-tosh kasalligi (OTK) o't-safro tizimini eng keng tarqalgan kasalliklaridan biri bo'lib, ayniqsa, keksa yoshdagi insonlar orasida muhim klinik va ijtimoiy-tibbiy muammo hisoblanadi. Yoshga bog'liq metabolik o'zgarishlar hamda surunkali kasalliklarning to'planishi OTK rivojlanish xavfi, klinik namoyon bo'lishi va kechishiga sezilarli ta'sir ko'rsatishi mumkin. Shu sababli komorbid holatlar tarkibini baholash xavfi yuqori bo'lgan shaxslarni erta aniqlash va profilaktika choralarini takomillashtirishga yordam berishi mumkin. Maqsad. O'zbekistonning Farg'ona vodiysida yashovchi 60–75 yoshdagi shaxslarda hamroh kasalliklar tarkibini va ularning o't-tosh kasalligi bilan bog'liqligini baholash. Materiallar va usullar. O'zbekistonning Farg'ona shahrida yashovchi 60–75 yoshdagi aholi o'rtasida populyatsion kuzatuv tadqiqoti o'tkazildi. Epidemiologik, klinik, laborator, instrumental va statistik usullardan foydalanildi. Demografik xususiyatlar, metabolik xavf omillari, yurak-qon tomir kasalliklari, oshqozon-ichak trakti va gepatobiliar tizim kasalliklari, nafas olish a'zolari va buyrak kasalliklari hamda boshqa surunkali holatlar to'g'risidagi ma'lumotlar klinik tekshiruvlar, profilaktik skrining natijalari va ambulator tibbiy hujjatlardan olindi. Statistik tahlil tadqiqot guruhlarini taqqoslash, kategorik o'zgaruvchilarni χ^2 mezonini yordamida baholash, nisbiy xavfni (RR), 95% ishonch oralig'ini (95% IO) va statistik ahamiyatlilik darajalarini hisoblashni o'z ichiga oldi. Natijalar. Tahlil o't-tosh kasalligi yuzasidan tekshirilgan keksa yoshdagi shaxslarda hamroh surunkali kasalliklar yukining yuqori ekanini ko'rsatdi. Eng ko'p uchragan hamroh holatlar yurak-qon tomir, gastroenterologik va gepatobiliar kasalliklar bo'ldi. Qiyosiy tahlilda yurak-qon tomir komorbidligi asosiy guruhdagi 17 nafar va nazorat guruhidagi 6 nafar shaxsda, gastroenterologik komorbidlik 16 va 1 nafar, gepatobiliar komorbidlik esa mos ravishda 21 va 9 nafar shaxsda qayd etildi. Nafas olish tizimiga oid komorbidlik 10 nafar va 2 nafar shaxsda, gematologik komorbidlik esa 2 nafar va 1 nafar shaxsda kuzatildi. Ushbu natijalar o't-tosh kasalligi bo'lgan shaxslarda surunkali metabolik buzilishlar hamda turli a'zo va tizimlar kasalliklari birgalikda uchrashini ko'rsatadi va multimorbidlik bilan keksa yoshdagi bemorlarda OTKning klinik-epidemiologik profili o'rtasida muhim bog'liqlik mavjudligini ko'rsatadi. Xulosa. 60–75 yoshdagi shaxslarda o't-tosh kasalligi, ayniqsa, yurak-qon tomir, gastroenterologik va gepatobiliar kasalliklar kabi komorbid holatlarning sezilarli yuki bilan kechadi. O't-tosh kasalligi mavjud yoki uning rivojlanish xavfi yuqori bo'lgan keksa yoshdagi shaxslarni xavf bo'yicha tabaqalashtirish va profilaktik kuzatishda hamroh kasalliklarni kompleks baholashni joriy etish lozim.

Kalit so'zlar: o't-tosh kasalligi; xolelitiaz; komorbidlik; multimorbidlik; keksa yoshdagi aholi; xavf omillari; metabolik buzilishlar; epidemiologiya; Farg'ona vodiysi; O'zbekiston.

INTRODUCTION

Gallstone disease is a common disorder of the hepatobiliary system and remains an important cause of morbidity and healthcare utilization worldwide. Its clinical and epidemiological significance increases with advancing age because older individuals frequently have several chronic diseases simultaneously. The pathogenesis of gallstone formation is multifactorial. In addition to age and sex, metabolic abnormalities, obesity, dyslipidemia, diabetes mellitus, impaired gallbladder motility, and hepatobiliary disorders may contribute



to lithogenesis. In older populations, these risk factors frequently coexist and interact with cardiovascular, gastrointestinal, respiratory, renal, and other chronic conditions. Comorbidity is therefore particularly relevant when evaluating gallstone disease in elderly populations. The simultaneous presence of several chronic disorders may influence the formation of gallstones, modify the clinical presentation of the disease, increase the probability of atypical or oligosymptomatic manifestations, and complicate therapeutic decision-making.

From an epidemiological perspective, comorbidity should not be considered merely as the numerical accumulation of individual diseases. Rather, it may represent an integrated indicator of the metabolic and systemic burden affecting the patient. Identification of characteristic comorbidity patterns among individuals with gallstone disease could therefore improve risk stratification and facilitate targeted screening and preventive interventions. Despite the clinical relevance of this problem, population-based data concerning the relationship between gallstone disease and comorbidity among older adults in Central Asia remain limited. Regional differences in lifestyle, dietary patterns, metabolic risk factors, healthcare access, and population characteristics highlight the need for locally generated epidemiological evidence. The aim of this study was to evaluate the structure of comorbid conditions and their association with gallstone disease among adults aged 60–75 years in the Fergana Valley of Uzbekistan.

LITERATURE REVIEW

Gallstone disease has been extensively studied as a multifactorial disorder in which age, sex, metabolic abnormalities, gallbladder dysmotility, and alterations in bile composition interact in the process of stone formation. Current clinical guidance and major reviews emphasize that cholesterol supersaturation of bile, impaired gallbladder emptying, and disturbances of hepatic lipid metabolism are central mechanisms of cholelithiasis [12–18]. Epidemiological studies further demonstrate that the prevalence and clinical burden of gallstone disease increase with age, making older adults a particularly important population for risk assessment and preventive monitoring [15, 18, 25–27]. A substantial body of research has linked gallstone disease with metabolic disorders. Diabetes mellitus, central and abdominal obesity, dyslipidemia, insulin resistance, and metabolic syndrome have repeatedly been associated with a higher probability of gallstone formation [19–23]. Experimental and clinical evidence indicates that hepatic insulin resistance can directly promote cholesterol gallstone formation, while obesity and unfavorable lipid profiles may contribute to increased biliary cholesterol secretion and reduced gallbladder motility [20–23]. More recent studies have reinforced this relationship by showing significant associations between metabolic dysfunction, altered metabolomic profiles, and gallstone disease [1–5].

The relationship between gallstone disease and cardiovascular morbidity has also received increasing attention. Several systematic reviews and meta-analyses have reported that individuals with gallstones may have a higher risk of cardiovascular disease and cardiovascular mortality [6–9]. This association is likely to be explained, at least in part, by shared cardiometabolic determinants such as advanced age, obesity, dyslipidemia, diabetes mellitus, hypertension, and physical inactivity. Therefore, the coexistence of gallstone disease and cardiovascular pathology should be interpreted within a broader multimorbidity framework rather than as an isolated biliary phenomenon. At the same time, evidence specifically addressing comorbidity patterns among elderly populations in Central Asia remains limited. Most available studies originate from Western, East Asian, or other large population cohorts, while regional differences in diet, lifestyle, metabolic risk, healthcare access, and demographic structure may influence both gallstone epidemiology and the profile of accompanying chronic diseases. This gap supports the need for population-based regional studies evaluating not only traditional metabolic risk factors but also the combined burden of cardiovascular, gastrointestinal, hepatobiliary, respiratory, renal, and hematological comorbidities in older adults with gallstone disease. The present study was designed to contribute such evidence for the Fergana Valley population of Uzbekistan.

RESEARCH METHODOLOGY

This population-based observational study was conducted in Fergana, Uzbekistan, during 2025–2027. The study was designed to assess the epidemiological characteristics of gallstone disease (GSD), associated metabolic and clinical risk factors, and patterns of comorbidity among adults aged 60–75 years. The investigation included epidemiological screening followed by a more detailed clinical and instrumental assessment of individuals included in the gallstone disease monitoring stage. A total of 2,089 adults aged 60–75 years were included in the population-based stage of the study. Of these, 1,071 participants (51.3%) constituted the main study group and 1,018 (48.7%) constituted the control group. The overall study population included 1,033 men (49.4%) and 1,056 women (50.6%). At the subsequent stage, 418 participants underwent detailed assessment related to gallstone disease. Of these, 206 (49.3%) were included in the main group and 212 (50.7%) in the



control group. The subgroup consisted of 177 men (42.3%) and 241 women (57.7%). Among participants in the main group, 75 were men and 131 were women, whereas the control group included 102 men and 110 women.

Participants were selected from the non-institutionalized population of Fergana aged 60-75 years. Population sampling was performed as part of an epidemiological monitoring program. Eligibility was determined according to predefined inclusion and exclusion criteria. Demographic information, clinical history, preventive examination data, outpatient medical records, laboratory results, and instrumental examination findings were used for subsequent analysis. The age range of 60-75 years was selected because this period is characterized by an increased prevalence of gallstone disease, metabolic abnormalities, and multiple chronic comorbid conditions. All participants underwent a standardized clinical and epidemiological evaluation. The following variables were assessed: age and sex; body mass index; presence of gallstone disease; arterial hypertension; diabetes mellitus; disorders of lipid metabolism; obesity and other metabolic abnormalities; cardiovascular comorbidity; gastrointestinal comorbidity; hepatobiliary comorbidity; respiratory comorbidity; renal comorbidity; hematological comorbidity; physical activity; daily fluid intake; hereditary predisposition; other concomitant chronic diseases. Medical history and comorbid conditions were evaluated using outpatient medical records, previous diagnostic findings, preventive examination records, and current clinical assessments.

Comorbid conditions were evaluated as an important component of the clinical and epidemiological profile of gallstone disease. For analytical purposes, concomitant diseases were grouped according to the predominantly affected organ system into the following categories: cardio-comorbidity, including major concomitant cardiovascular disorders; gastro-comorbidity, representing gastrointestinal diseases; hepato-comorbidity, representing concomitant liver and hepatobiliary disorders; respiratory comorbidity, representing chronic respiratory diseases; renal comorbidity, representing renal disorders; and hemato-comorbidity, representing relevant hematological conditions. The distribution of these comorbidity categories was compared between the main and control groups. Laboratory assessment included routinely available hematological and biochemical parameters obtained from outpatient records and preventive examinations. The general blood test included hemoglobin concentration, erythrocyte count, leukocyte count, platelet count, and erythrocyte sedimentation rate. Metabolic assessment included parameters relevant to lipid metabolism and other metabolic risk factors associated with gallstone formation. Instrumental evaluation was used to confirm gallstone disease and assess the condition of the gallbladder and hepatobiliary system. Statistical analysis was performed using IBM SPSS Statistics version 27.0. Categorical variables were summarized as absolute numbers and percentages. Differences between groups were assessed using the Pearson χ^2 test where appropriate. The strength of associations between selected risk factors and gallstone disease was evaluated using relative risk (RR) estimates with corresponding 95% confidence intervals (95% CI). A p value of <0.05 was considered statistically significant, while $p<0.001$ was interpreted as indicating a highly statistically significant difference. Sex-stratified analyses were performed where appropriate to assess potential differences between men and women. The study findings were prepared for reporting in accordance with the principles of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement.

ANALYSIS AND RESULTS

The population-based stage of the study included 2,089 adults aged 60–75 years. Of these, 1,071 participants (51.3%) constituted the main group and 1,018 (48.7%) constituted the control group. The overall population included 1,033 men (49.4%) and 1,056 women (50.6%). A subsequent detailed clinical and epidemiological assessment of gallstone disease included 418 participants. The main group consisted of 206 individuals (49.3%), whereas the control group included 212 individuals (50.7%). Men accounted for 177 participants (42.3%), and women accounted for 241 participants (57.7%).

Table 1.

Characteristics of participants included in the detailed gallstone disease assessment

Sex	60-75-year-old population diagnosed with gallstone disease				All participants,	
	Main group		Control group			
	abs	%	abs	%	abs	%
Men	75	17,9	102	24,4	177	42,3
Women	131	31,3	110	26,3	241	57,7
Total	206	49,3	212	50,7	418	100.0

Sex-stratified analysis demonstrated a statistically significant difference between the study groups among men ($\chi^2=4.207$; $p<0.05$; $RR=0.706$; 95% CI: 0.506–0.986). Among women, the difference was not statistically significant ($\chi^2=0.322$; $p>0.05$; $RR=1.085$; 95% CI: 0.818–1.441). In the overall analysis, no



statistically significant difference was observed between the groups ($\chi^2=0.825$; $p>0.05$; $RR=0.905$; 95% CI: 0.731–1.122). These findings indicate that the groups were broadly comparable for subsequent evaluation of metabolic, clinical, and comorbidity-related factors. Metabolic abnormalities represented an important component of the clinical and epidemiological profile of the investigated population. Hypercholesterolemia was identified in 529 participants. Of these, 370 (69.9%) belonged to the main group and 159 (30.1%) to the control group. The difference between the groups was highly statistically significant ($\chi^2=98.88$; $p<0.001$). The estimated relative risk was $RR=2.852$ (95% CI: 2.309–3.521), indicating a strong association between hypercholesterolemia and gallstone disease in the investigated population.

Table 2.

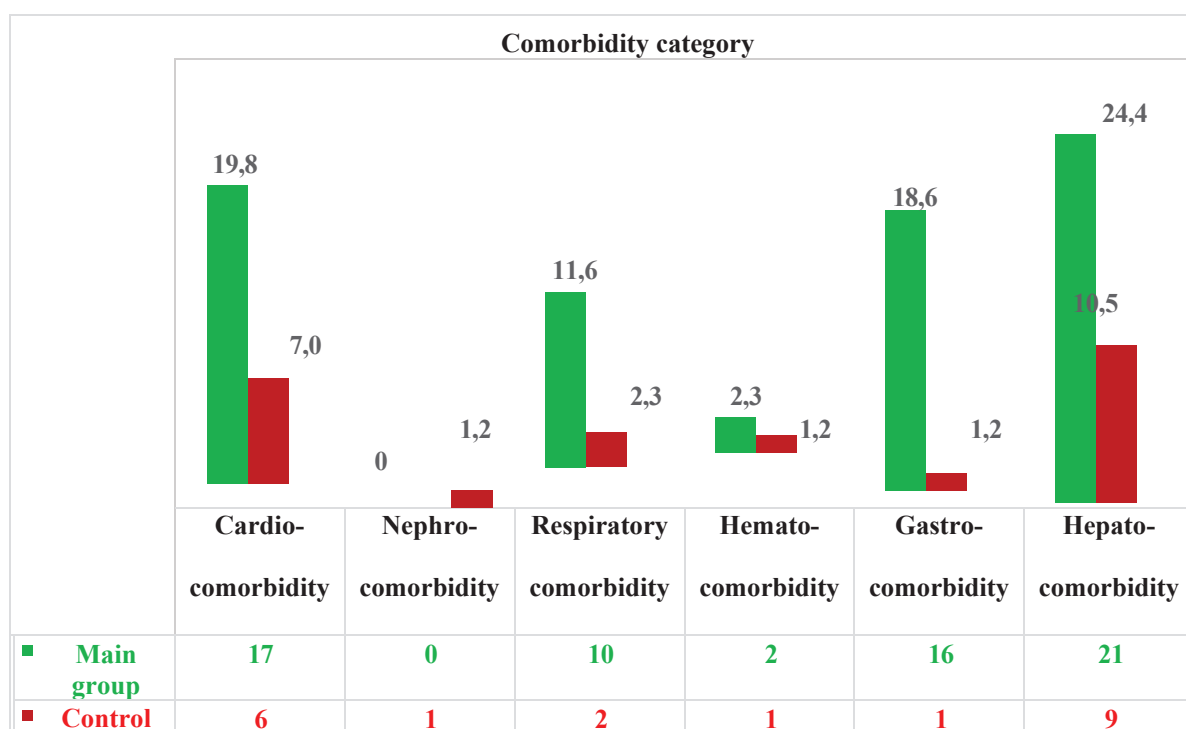
Distribution of hypercholesterolemia according to study group and sex

Characteristic	hypercholesterolemia						χ²	P	RR	95%CI
	Main group		Control group		Total,					
	n	%	n	%	n	%				
Men	155	29,3	70	13,2	225	42,5	46,66	<0,001	2,998	2,172-4,137
Women	215	40,6	89	16,8	304	57,5	52,75	<0,001	2,758	2,086-3,646
Total	370	69,9	159	30,1	529	100,0	98,88	<0,001	2,852	2,309-3,521

Hypertriglyceridemia was identified in 454 participants. Among them, 292 (64.3%) were in the main group and 162 (35.7%) were in the control group. The between-group difference was statistically significant ($\chi^2=39.53$; $p<0.001$), further supporting the association between disturbances of lipid metabolism and gallstone disease. Taken together, these findings indicate that abnormalities of lipid metabolism, particularly hypercholesterolemia and hypertriglyceridemia, are important metabolic factors associated with GSD in the investigated older population. A substantial burden of concomitant chronic diseases was observed among individuals evaluated for gallstone disease. Cardiovascular, gastroenterological, hepatobiliary, respiratory, renal, and hematological comorbidities were analyzed separately. The most prominent differences between the study groups were observed for hepatobiliary, cardiovascular, and gastrointestinal comorbidities.

Table 3.

Distribution of comorbidity categories in the study groups





Hepato-comorbidity represented the most frequently recorded category in the main group, with 21 cases compared with 9 cases in the control group. Cardio-comorbidity was also more frequent in the main group (17 cases) than in the control group (6 cases). A marked numerical difference was observed for gastro-comorbidity, which was recorded in 16 individuals in the main group compared with only one individual in the control group. Respiratory comorbidity was documented in 10 and 2 individuals in the main and control groups, respectively. In contrast, renal comorbidity was uncommon and was not recorded in the main group, whereas one case was identified in the control group. Hematological comorbidity was also relatively uncommon, with two cases in the main group and one in the control group. Overall, the distribution demonstrated clustering of hepatobiliary, cardiovascular, gastrointestinal, and respiratory comorbid conditions in the main group. The predominance of hepatobiliary and cardiovascular comorbidities suggests that gallstone disease in older adults should be considered within a broader systemic and metabolic context rather than as an isolated biliary disorder. The concomitant presence of arterial hypertension, obesity, dyslipidemia, diabetes mellitus, and other chronic metabolic conditions may contribute to alterations in gallbladder motility, bile composition, and lithogenicity. The combination of metabolic abnormalities and multiple chronic diseases may also influence the clinical presentation of GSD in older adults and contribute to atypical or oligosymptomatic disease manifestations. Therefore, the observed comorbidity pattern supports a comprehensive clinical approach that integrates hepatobiliary assessment with evaluation of cardiovascular and metabolic risk factors.

The principal findings of the study can be summarized as follows: Gallstone disease in adults aged 60–75 years was associated with a substantial burden of concomitant chronic diseases. Hepatobiliary, cardiovascular, and gastrointestinal comorbidities predominated in the main group. Hypercholesterolemia demonstrated a strong association with gallstone disease (RR=2.852; 95% CI: 2.309–3.521; $p<0.001$). Hypertriglyceridemia was also significantly associated with the study-group distribution ($\chi^2=39.53$; $p<0.001$). The combined presence of metabolic abnormalities and comorbid diseases supports the concept that gallstone disease in older adults represents a multifactorial clinical and epidemiological problem requiring comprehensive risk assessment. The present study demonstrates that gallstone disease (GSD) in adults aged 60–75 years is accompanied by a considerable burden of metabolic abnormalities and chronic comorbid conditions. The most prominent comorbidity patterns in the main group involved hepatobiliary, cardiovascular, and gastrointestinal disorders, while respiratory comorbidity was also more frequently recorded in the main group. An important finding of the study was the strong relationship between disorders of lipid metabolism and GSD. Hypercholesterolemia showed a pronounced association with the study-group distribution (RR=2.852; 95% CI: 2.309–3.521; $p<0.001$), while hypertriglyceridemia was also significantly more frequent in the main group ($\chi^2=39.53$; $p<0.001$). Taken together, these findings support the concept that GSD in older adults should not be considered solely as an isolated disorder of the gallbladder. Rather, it frequently occurs within a broader metabolic and multimorbid clinical context.

The strong association observed between hypercholesterolemia and GSD is biologically plausible. Cholesterol supersaturation of bile represents a central mechanism in the formation of cholesterol gallstones. Disturbances in lipid metabolism may promote excessive hepatic cholesterol secretion into bile, while impaired gallbladder motility may facilitate nucleation and subsequent stone formation. Our finding that hypercholesterolemia was markedly more common in the main group is consistent with the growing understanding of GSD as a disorder closely related to metabolic dysfunction. The association observed for hypertriglyceridemia further strengthens this interpretation. Elevated triglyceride levels commonly coexist with insulin resistance, obesity, dyslipidemia, and other components of metabolic syndrome. Consequently, the simultaneous presence of several metabolic abnormalities may create a metabolic environment favorable to gallstone formation. Recent literature increasingly considers gallstone disease and metabolic syndrome as interconnected conditions. Insulin resistance, dyslipidemia, obesity, altered bile composition, gallbladder dysmotility, chronic low-grade inflammation, and potentially alterations in the gut microbiota may contribute to this relationship. Thus, our findings from an older population in the Fergana Valley are broadly consistent with the contemporary metabolic model of gallstone pathogenesis.

Cardiovascular comorbidity represented one of the predominant comorbidity categories identified in the main group. Cardio-comorbidity was recorded in 17 individuals in the main group compared with 6 individuals in the control group. This observation is of particular interest because GSD and cardiovascular disease share several established cardiometabolic risk factors, including increasing age, obesity, dyslipidemia, diabetes mellitus, hypertension, and physical inactivity. Previous large population-based investigations have demonstrated an association between GSD and subsequent cardiovascular outcomes. This relationship has also been supported by systematic reviews and meta-analyses. A recent meta-analysis including more than two million participants reported a significant association between GSD and cardiovascular disease. Earlier large cohort studies similarly demonstrated increased cardiovascular risk among individuals with gallstones. The



cardiovascular comorbidity pattern observed in our study therefore appears to be consistent with international epidemiological evidence. Nevertheless, the present findings should be interpreted cautiously. The observed clustering of cardiovascular disorders does not, by itself, establish a direct causal relationship between GSD and cardiovascular disease. Shared metabolic determinants may partly explain their coexistence.

Hepato-comorbidity was the most frequently recorded comorbidity category in the main group, occurring in 21 individuals compared with 9 in the control group. This finding is clinically plausible because gallstone formation is closely related to hepatic cholesterol metabolism, bile composition, enterohepatic circulation, and gallbladder function. Chronic hepatobiliary disorders may therefore coexist with or contribute to the clinical background in which gallstone disease develops. Gastrointestinal comorbidity also showed a marked numerical difference between groups, being recorded in 16 individuals in the main group compared with one individual in the control group. The coexistence of gastrointestinal disorders is particularly important in older adults because dyspeptic symptoms, abdominal discomfort, nausea, bloating, and nonspecific upper abdominal pain may overlap with the clinical manifestations of GSD. Consequently, the presence of gastrointestinal comorbidity may complicate differential diagnosis and contribute to delayed recognition of biliary disease. Age is an important factor in the epidemiology and clinical presentation of GSD. In older adults, the accumulation of metabolic abnormalities and chronic diseases may substantially modify the natural history of biliary disorders. An additional clinical concern is that biliary disease in elderly patients may present with subtle, oligosymptomatic, or atypical manifestations. Classical biliary colic may be absent, and symptoms may instead include nonspecific abdominal discomfort, dyspepsia, nausea, loss of appetite, or general weakness. This characteristic has important practical implications. In patients aged 60–75 years with multiple chronic diseases, reliance exclusively on classical biliary symptoms may delay diagnosis. Therefore, targeted ultrasonographic assessment and careful evaluation of metabolic and comorbidity profiles may be particularly valuable in older individuals at increased risk of GSD.

The findings of the present study have several potential clinical implications. First, assessment of GSD in older adults should include evaluation of metabolic abnormalities, particularly lipid disorders. Second, identification of cardiovascular, hepatobiliary, and gastrointestinal comorbidities may provide a more comprehensive understanding of an individual patient's risk profile. Third, patients with clustering of dyslipidemia, obesity, diabetes mellitus, arterial hypertension, and other chronic metabolic disorders may constitute an important population for targeted preventive monitoring. From a public health perspective, integrating gallstone risk assessment into preventive programs for older adults may facilitate earlier identification of individuals requiring ultrasonographic evaluation or more intensive metabolic risk-factor management. The results also support a multidisciplinary approach involving primary care physicians, surgeons, gastroenterologists, cardiologists, and other specialists when clinically indicated. An important strength of the present investigation is its population-based approach focusing specifically on adults aged 60–75 years. The study incorporated epidemiological, clinical, laboratory, instrumental, and statistical assessments, allowing GSD to be evaluated within the broader context of metabolic risk factors and chronic comorbidity. Another strength is the analysis of several organ-system-specific comorbidity categories rather than assessment of a single accompanying disease. Furthermore, the study provides regional data from the Fergana Valley, contributing evidence from a Central Asian population that remains comparatively underrepresented in the international literature on gallstone epidemiology.

Several limitations should be acknowledged. First, the observational nature of the study limits causal inference. Associations identified between GSD, metabolic abnormalities, and comorbid conditions should therefore not be interpreted as evidence of direct causation. Second, some comorbidity categories contained relatively small numbers of participants. This is particularly relevant for nephrological and hematological comorbidities and may limit the precision of comparisons for these categories. Third, the presence of multiple metabolic and chronic diseases introduces the possibility of residual confounding. Factors such as dietary patterns, medication use, duration and severity of chronic diseases, socioeconomic characteristics, and other lifestyle-related variables may influence the observed relationships. Fourth, because the study focused on adults aged 60–75 years from a defined geographical population, generalization of the findings to younger populations or populations with substantially different demographic and metabolic characteristics should be made cautiously. Further prospective and multicenter studies using standardized multimorbidity indices and multivariable regression models are warranted to clarify the independent contribution of individual comorbid conditions to the development and clinical course of gallstone disease.

The present findings suggest that GSD in older adults is embedded within a complex network of metabolic and chronic disorders. The pronounced association with lipid abnormalities and the clustering of cardiovascular, hepatobiliary, and gastrointestinal comorbidities support an integrated approach to risk assessment. Rather than evaluating gallstones as an isolated structural abnormality of the gallbladder, clinicians should consider the patient's overall metabolic and comorbidity profile. Such an approach may improve early detection, individualized prevention, clinical decision-making, and long-term management of older adults with or at risk of gallstone disease. The present study demonstrates that gallstone disease (GSD) in adults aged 60–75



years is accompanied by a considerable burden of metabolic abnormalities and chronic comorbid conditions. The most prominent comorbidity patterns in the main group involved hepatobiliary, cardiovascular, and gastrointestinal disorders, while respiratory comorbidity was also more frequently recorded in the main group. An important finding of the study was the strong relationship between disorders of lipid metabolism and GSD. Hypercholesterolemia showed a pronounced association with the study-group distribution (RR=2.852; 95% CI: 2.309–3.521; $p<0.001$), while hypertriglyceridemia was also significantly more frequent in the main group ($\chi^2=39.53$; $p<0.001$). Taken together, these findings support the concept that GSD in older adults should not be considered solely as an isolated disorder of the gallbladder. Rather, it frequently occurs within a broader metabolic and multimorbid clinical context. The strong association observed between hypercholesterolemia and GSD is biologically plausible. Cholesterol supersaturation of bile represents a central mechanism in the formation of cholesterol gallstones. Disturbances in lipid metabolism may promote excessive hepatic cholesterol secretion into bile, while impaired gallbladder motility may facilitate nucleation and subsequent stone formation. Our finding that hypercholesterolemia was markedly more common in the main group is consistent with the growing understanding of GSD as a disorder closely related to metabolic dysfunction. The association observed for hypertriglyceridemia further strengthens this interpretation. Elevated triglyceride levels commonly coexist with insulin resistance, obesity, dyslipidemia, and other components of metabolic syndrome. Consequently, the simultaneous presence of several metabolic abnormalities may create a metabolic environment favorable to gallstone formation. Recent literature increasingly considers gallstone disease and metabolic syndrome as interconnected conditions. Insulin resistance, dyslipidemia, obesity, altered bile composition, gallbladder dysmotility, chronic low-grade inflammation, and potentially alterations in the gut microbiota may contribute to this relationship. Thus, our findings from an older population in the Fergana Valley are broadly consistent with the contemporary metabolic model of gallstone pathogenesis.

Cardiovascular comorbidity represented one of the predominant comorbidity categories identified in the main group. Cardio-comorbidity was recorded in 17 individuals in the main group compared with 6 individuals in the control group. This observation is of particular interest because GSD and cardiovascular disease share several established cardiometabolic risk factors, including increasing age, obesity, dyslipidemia, diabetes mellitus, hypertension, and physical inactivity. Previous large population-based investigations have demonstrated an association between GSD and subsequent cardiovascular outcomes. This relationship has also been supported by systematic reviews and meta-analyses. A recent meta-analysis including more than two million participants reported a significant association between GSD and cardiovascular disease. Earlier large cohort studies similarly demonstrated increased cardiovascular risk among individuals with gallstones. The cardiovascular comorbidity pattern observed in our study therefore appears to be consistent with international epidemiological evidence. Nevertheless, the present findings should be interpreted cautiously. The observed clustering of cardiovascular disorders does not, by itself, establish a direct causal relationship between GSD and cardiovascular disease. Shared metabolic determinants may partly explain their coexistence.

Hepato-comorbidity was the most frequently recorded comorbidity category in the main group, occurring in 21 individuals compared with 9 in the control group. This finding is clinically plausible because gallstone formation is closely related to hepatic cholesterol metabolism, bile composition, enterohepatic circulation, and gallbladder function. Chronic hepatobiliary disorders may therefore coexist with or contribute to the clinical background in which gallstone disease develops. Gastrointestinal comorbidity also showed a marked numerical difference between groups, being recorded in 16 individuals in the main group compared with one individual in the control group. The coexistence of gastrointestinal disorders is particularly important in older adults because dyspeptic symptoms, abdominal discomfort, nausea, bloating, and nonspecific upper abdominal pain may overlap with the clinical manifestations of GSD. Consequently, the presence of gastrointestinal comorbidity may complicate differential diagnosis and contribute to delayed recognition of biliary disease. Age is an important factor in the epidemiology and clinical presentation of GSD. In older adults, the accumulation of metabolic abnormalities and chronic diseases may substantially modify the natural history of biliary disorders. An additional clinical concern is that biliary disease in elderly patients may present with subtle, oligosymptomatic, or atypical manifestations. Classical biliary colic may be absent, and symptoms may instead include nonspecific abdominal discomfort, dyspepsia, nausea, loss of appetite, or general weakness. This characteristic has important practical implications. In patients aged 60–75 years with multiple chronic diseases, reliance exclusively on classical biliary symptoms may delay diagnosis. Therefore, targeted ultrasonographic assessment and careful evaluation of metabolic and comorbidity profiles may be particularly valuable in older individuals at increased risk of GSD.

The findings of the present study have several potential clinical implications. First, assessment of GSD in older adults should include evaluation of metabolic abnormalities, particularly lipid disorders. Second, identification of cardiovascular, hepatobiliary, and gastrointestinal comorbidities may provide a more comprehensive understanding of an individual patient's risk profile. Third, patients with clustering of dyslipidemia, obesity, diabetes mellitus, arterial hypertension, and other chronic metabolic disorders may constitute an important



population for targeted preventive monitoring. From a public health perspective, integrating gallstone risk assessment into preventive programs for older adults may facilitate earlier identification of individuals requiring ultrasonographic evaluation or more intensive metabolic risk-factor management. The results also support a multidisciplinary approach involving primary care physicians, surgeons, gastroenterologists, cardiologists, and other specialists when clinically indicated. An important strength of the present investigation is its population-based approach focusing specifically on adults aged 60–75 years. The study incorporated epidemiological, clinical, laboratory, instrumental, and statistical assessments, allowing GSD to be evaluated within the broader context of metabolic risk factors and chronic comorbidity. Another strength is the analysis of several organ-system-specific comorbidity categories rather than assessment of a single accompanying disease.

Furthermore, the study provides regional data from the Fergana Valley, contributing evidence from a Central Asian population that remains comparatively underrepresented in the international literature on gallstone epidemiology. Several limitations should be acknowledged. First, the observational nature of the study limits causal inference. Associations identified between GSD, metabolic abnormalities, and comorbid conditions should therefore not be interpreted as evidence of direct causation. Second, some comorbidity categories contained relatively small numbers of participants. This is particularly relevant for nephrological and hematological comorbidities and may limit the precision of comparisons for these categories. Third, the presence of multiple metabolic and chronic diseases introduces the possibility of residual confounding. Factors such as dietary patterns, medication use, duration and severity of chronic diseases, socioeconomic characteristics, and other lifestyle-related variables may influence the observed relationships. Fourth, because the study focused on adults aged 60–75 years from a defined geographical population, generalization of the findings to younger populations or populations with substantially different demographic and metabolic characteristics should be made cautiously. Further prospective and multicenter studies using standardized multimorbidity indices and multivariable regression models are warranted to clarify the independent contribution of individual comorbid conditions to the development and clinical course of gallstone disease. The present findings suggest that GSD in older adults is embedded within a complex network of metabolic and chronic disorders. The pronounced association with lipid abnormalities and the clustering of cardiovascular, hepatobiliary, and gastrointestinal comorbidities support an integrated approach to risk assessment. Rather than evaluating gallstones as an isolated structural abnormality of the gallbladder, clinicians should consider the patient's overall metabolic and comorbidity profile. Such an approach may improve early detection, individualized prevention, clinical decision-making, and long-term management of older adults with or at risk of gallstone disease.

CONCLUSION

The present study demonstrates that gallstone disease in adults aged 60–75 years is closely associated with a substantial burden of metabolic abnormalities and concomitant chronic diseases. The observed comorbidity profile was characterized predominantly by hepatobiliary, cardiovascular, gastrointestinal, and respiratory disorders, emphasizing the complex clinical background of GSD in older adults. Disorders of lipid metabolism represented particularly important factors. Hypercholesterolemia showed a strong association with gallstone disease (RR=2.852; 95% CI: 2.309–3.521; $p<0.001$), while hypertriglyceridemia was also significantly associated with the study-group distribution ($\chi^2=39.53$; $p<0.001$). These findings support the important role of metabolic disturbances in the clinical and epidemiological profile of gallstone disease. The clustering of cardiovascular, hepatobiliary, and gastrointestinal comorbidities further indicates that GSD in older adults should not be considered solely as an isolated biliary disorder. Comprehensive assessment of the patient's metabolic status and concomitant chronic diseases is warranted when evaluating individuals with or at increased risk of gallstone disease. From a preventive perspective, individuals aged 60–75 years with dyslipidemia, obesity, diabetes mellitus, arterial hypertension, or multiple chronic diseases may benefit from targeted risk assessment and appropriate hepatobiliary evaluation. Early identification and correction of modifiable metabolic risk factors may contribute to improving preventive strategies in this population. Further prospective, multicenter studies with multivariable adjustment are needed to determine the independent contribution of individual comorbid conditions to the development and clinical course of gallstone disease.

The study was conducted in accordance with applicable institutional and ethical principles for medical research involving human participants. Information concerning approval by the relevant institutional ethics committee, including the approval number and date, should be inserted in accordance with the final study documentation and the requirements of the target journal. Not applicable. The manuscript does not contain identifiable individual patient information. The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to institutional and ethical requirements. The authors declare no conflict of interest related to this study. Information regarding financial support for the study should be reported according to the actual funding status of the research. Author contributions should be specified according



to the requirements of the selected journal and, where applicable, the CRediT contributor roles taxonomy. The authors acknowledge the healthcare professionals and institutions involved in the epidemiological, clinical, laboratory, and instrumental stages of the study and thank all participants for their contribution to the research. Gallstone disease in the older population represents a multifactorial clinical and epidemiological condition closely intertwined with metabolic abnormalities and multimorbidity. Incorporating metabolic and comorbidity assessment into preventive monitoring may improve identification of high-risk individuals and support more individualized approaches to gallstone disease prevention and management.

REFERENCES:

1. Wang K, Liu Z, Tang R, Sha Y, Wang Z, Chen Y, et al. Gallstones in the era of metabolic syndrome: pathophysiology, risk prediction, and management. *Cureus*. 2025;17(3). doi:10.7759/cureus.80541. PMID: 40225487.
2. Tang YF, Su YT, Liang LJ, Feng Y, Huang XJ, Xiang XL, et al. Association between metabolic dysfunction and gallstone disease in U.S. adults: an analysis of the National Health and Nutrition Examination Survey. *J Dig Dis*. 2025;26(3-4):158-169. doi:10.1111/1751-2980.13349. PMID: 40420773.
3. Chen J, Liu ZT, Lyu JT, Jiang GP. Impact of metabolic disorders on gallstone disease and perioperative recovery after laparoscopic cholecystectomy. *Hepatobiliary Pancreat Dis Int*. 2024;23(6):604-612. doi:10.1016/j.hbpd.2024.08.001. PMID: 39129076.
4. Uche-Anyia E, Ha J, Balasubramanian R, Rexrode KM, Chan AT. Metabolomic profiles of incident gallstone disease. *BMJ Open Gastroenterol*. 2024;11(1). doi:10.1136/bmjgast-2024-001417. PMID: 39209332.
5. Rodriguez Gatta D, et al. Sex disparities in gallstone disease: insights from the MAUCO prospective population-based cohort study. *BMJ Open Gastroenterol*. 2024;11(1). doi:10.1136/bmjgast-2024-001457. PMID: 39343441.
6. Rahimi R, Heidari-Soureshjani S, Sherwin CMT, Kasiri K, Rahimian G. The association between gallstone disease and cardiovascular disease: a systematic review and meta-analysis. *Rev Recent Clin Trials*. 2025;20(2):142-152. doi:10.2174/0115748871326450240926072451. PMID: 39385412.
7. Hasan, et al. Gallstones as a predictor of elevated cardiovascular disease risk: a meta-analysis and meta-regression of over 7.4 million participants. 2025. PMID: 40106516.
8. Rahimi R, Masoumi S, Badali A, Jafari N, Heidari-Soureshjani S, Sherwin CMT. Association between gallstone disease and risk of mortality of cardiovascular disease and cancer: a systematic review and meta-analysis. 2024;24(1):47-58. doi:10.2174/011871529X298791240607041246. PMID: 38874034.
9. Upala S, Sanguankeo A, Jaruvongvanich V. Gallstone disease and the risk of cardiovascular disease: a systematic review and meta-analysis of observational studies. *Scand J Surg*. 2017;106(1):21-27. PMID: 27255283.
10. Complex impacts of gallstone disease on metabolic syndrome and nonalcoholic fatty liver disease: a systematic review and meta-analysis. 2022. PMID: 36506064.
11. Increasing gallstone disease prevalence and associations with gallbladder and biliary tract mortality in the US. *Hepatology*. 2023. PMID: 36631004.
12. European Association for the Study of the Liver (EASL). EASL Clinical Practice Guidelines on the prevention, diagnosis and treatment of gallstones. *J Hepatol*. 2016;65(1):146-181.
13. Lammert F, Gurusamy K, Ko CW, Miquel JF, Méndez-Sánchez N, Portincasa P, et al. Gallstones. *Nat Rev Dis Primers*. 2016;2:16024.
14. Portincasa P, Moschetta A, Palasciano G. Cholesterol gallstone disease. *Lancet*. 2006;368(9531):230-239.
15. Stinton LM, Shaffer EA. Epidemiology of gallbladder disease: cholelithiasis and cancer. *Gut Liver*. 2012;6(2):172-187.
16. Di Ciaula A, Wang DQH, Portincasa P. An update on the pathogenesis of cholesterol gallstone disease. *Curr Opin Gastroenterol*. 2018;34(2):71-80.
17. Wang DQH, Cohen DE, Carey MC. Biliary lipids and cholesterol gallstone disease. *J Lipid Res*. 2009;50(Suppl).
18. Shaffer EA. Epidemiology and risk factors for gallstone disease: has the paradigm changed in the 21st century? *Curr Gastroenterol Rep*. 2005;7(2):132-140.
19. Aune D, Vatten LJ. Diabetes mellitus and the risk of gallbladder disease: a systematic review and meta-analysis of prospective studies. *J Diabetes Complications*. 2016;30(2):368-373.
20. Tsai CJ, Leitzmann MF, Willett WC, Giovannucci EL. Central adiposity, regional fat distribution, and the risk of cholecystectomy in women. *Gut*. 2006;55(5):708-714.



21. Tsai CJ, Leitzmann MF, Willett WC, Giovannucci EL. Prospective study of abdominal adiposity and gallstone disease in US men. *Am J Clin Nutr.* 2004;80(1):38-44.
22. Méndez-Sánchez N, Chavez-Tapia NC, Motola-Kuba D, Sanchez-Lara K, Ponciano-Rodríguez G, Baptista H, et al. Metabolic syndrome as a risk factor for gallstone disease. *World J Gastroenterol.* 2005;11(11):1653-1657.
23. Biddinger SB, Haas JT, Yu BB, Bezy O, Jing E, Zhang W, et al. Hepatic insulin resistance directly promotes formation of cholesterol gallstones. *Nat Med.* 2008;14(7):778-782.
24. Marschall HU, Einarsson C. Gallstone disease. *J Intern Med.* 2007;261(6):529-542.
25. Everhart JE, Khare M, Hill M, Maurer KR. Prevalence and ethnic differences in gallbladder disease in the United States. *Gastroenterology.* 1999;117(3):632-639.
26. Shabanzadeh DM. Incidence of gallstone disease and complications. *Curr Opin Gastroenterol.* 2018;34(2):81-89.
27. Friedman GD. Natural history of asymptomatic and symptomatic gallstones. *Am J Surg.* 1993;165(4):399-404.
28. Reshetnyak VI. Concept of the pathogenesis and treatment of cholelithiasis. *World J Hepatol.* 2012;4(2):18-34.
29. Di Ciaula A, Garruti G, Frühbeck G, De Angelis M, de Bari O, Wang DQH, et al. The role of diet in the pathogenesis of cholesterol gallstones. *Curr Med Chem.* 2019;26(19):3620-3638.
30. Wang DQH, Portincasa P, editors. *Gallstones: Recent Advances in Epidemiology, Pathogenesis, Diagnosis and Management.* New York: Nova Science Publishers; 2017.

TIBBIYOT

TA'LIMI & INNOVATSIYALARI

2026. № 10

Muharrir: Sherzod Qurbonov

Mas'ul kotib: Surmaniso Mirzaliyeva

Dizayner: Oloviddin Sobir o'g'li

© Materiallar ko'chirib bosilganda "Tibbiyot ta'limi va innovatsiyalari" ilmi elektron jurnali manba sifatida ko'rsatilishi shart. Jurnalda bosilgan material va reklamalardagi dalillarning aniqligiga mualliflar ma'sul. Tahririyat fikri har vaqt ham mualliflar fikriga mos kelamasligi mumkin. Tahririyatga yuborilgan materiallar qaytarilmaydi.

Jurnalga istalgan payt quyidagi rekvizitlar orqali obuna bo'lishingiz mumkin. Obuna bo'lgach, @iqtisodiyot_77 telegram sahifamizga to'lov haqidagi ma'lumotni skrinshot yoki foto shaklida jo'natishingizni so'raymiz. Shu asosda har oygi jurnal yangi sonini manzilingizga jo'natamiz.

Mazkur jurnalda maqolalar chop etish uchun quyidagi havolalarga maqola, reklama, hikoya va boshqa ijodiy materiallar yuborishingiz mumkin.

Materiallar va reklamalar pullik asosda chop etiladi.

El.Pochta: sq143235@gmail.com

Bot: @munis_sm

Tel.: 97 748 70 03





Google
scholar

