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CLINICAL AND EPIDEMIOLOGICAL CHARACTERISTICS OF PARASITIC DISEASES IN ADULTS: DIAGNOSTIC PATTERNS AND STATISTICAL ANALYSIS



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ABSTRACT

Parasitic infections remain a significant public health issue among adults, often presenting with vague or chronic clinical manifestations. This study evaluated the clinical and epidemiological features of parasitic diseases in 250 patients aged 18–60 years. Comprehensive laboratory and instrumental diagnostics revealed a high prevalence of giardiasis (38.4%) and ascariasis (22.0%), followed by echinococcosis (14.4%), enterobiasis (12.8%), and toxocariasis (8.4%). The predominant clinical presentation included dyspeptic syndrome (72.8%), abdominal pain (66.0%), asthenovegetative disorders (59.2%), and peripheral eosinophilia (54.0%). The integration of coprological, serological (ELISA), and ultrasound methods significantly improved diagnostic accuracy.

Keywords: parasitic diseases, helminthiasis, giardiasis, clinical epidemiology, eosinophilia, ELISA, abdominal pain, dyspeptic syndrome.

KATTA YOSHLILARDA PARAZITAR KASALLIKLARNING KLINIK VA EPIDEMIOLOGIK XUSUSIYATLARI: TASHXISLASH VA STATISTIK TAHLIL

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ANNOTATSIYA

Parazitar kasalliklar kattalar aholisi orasida surunkali va niqoblangan kechishi bilan ajralib turadigan dolzarb tibbiy-ijtimoiy muammodir. Ushbu tadqiqotda 18–60 yoshdagi 250 nafar bemorda parazitar invaziyalarning klinik va epidemiologik xususiyatlari o'rganildi. Kompleks laborator-instrumental diagnostika natijasida lyamblioz (38.4%) va askaridoz (22.0%) eng ko'p uchraydigan etiologik omillar ekanligi aniqlandi. Klinik manzarada dispeptik sindrom (72.8%), abdominal og'riqlar (66.0%), astenovegetativ buzilishlar (59.2%) va periferik eozinofiliya (54.0%) yetakchilik qildi. Koprofagik, serologik (IFA) va ultratovush diagnostikasini majburiy qo'llash tashxis aniqligini sezilarli darajada oshirishi isbotlandi.

Kalit so'zlar: parazitar kasalliklar, gelmintozlar, lyamblioz, klinik epidemiologiya, eozinofiliya, IFA, abdominal og'riq, dispeptik sindrom.



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КЛИНИКО-ЭПИДЕМИОЛОГИЧЕСКАЯ ХАРАКТЕРИСТИКА ПАРАЗИТАРНЫХ ЗАБОЛЕВАНИЙ У ВЗРОСЛЫХ: ДИАГНОСТИЧЕСКИЕ ПАТТЕРНЫ И СТАТИСТИЧЕСКИЙ АНАЛИЗ

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АННОТАЦИЯ

Паразитарные болезни представляют собой актуальную проблему здравоохранения среди взрослого населения, часто протекая под маской хронической соматической патологии. В исследование были включены 250 пациентов в возрасте 18–60 лет с паразитарными инвазиями и подозрением на них. В структуре заболеваемости преобладали лямблиоз (38,4%) и аскаридоз (22,0%). В клинической картине доминировали диспептический синдром (72,8%), абдоминальный болевой синдром (66,0%), астеновегетативные расстройства (59,2%) и эозинофилия периферической крови (54,0%). Комплексное применение копрологических, серологических (ИФА) и ультразвуковых методов существенно повышает эффективность диагностики.

Ключевые слова: паразитарные болезни, гельминтозы, лямблиоз, клиническая эпидемиология, эозинофилия, ИФА, абдоминальная боль, диспептический синдром.

Introduction. In modern medicine and public health, parasitic diseases (helminthiases and protozoan infections) represent some of the most prevalent yet underappreciated pathologies [1, 5, 6]. According to World Health Organization (WHO) data, more than 25–30% of the global population is infected with various parasitic infestations [11, 14]. In the adult population, parasitic diseases predominantly present without pronounced clinical symptoms, running a chronic, oligosymptomatic course, or masquerading as gastroenterological and allergic disorders [2, 7].

In adults, parasitoses are notably characterized by subclinical, masked, and chronic clinical courses. This frequently leads to prolonged diagnostic delays, as these conditions mimic gastrointestinal tract pathologies (such as chronic cholecystitis, gastroduodenitis, and irritable bowel syndrome), asthenovegetative syndromes, and allergic dermatoses [2, 7, 13]. Long-term parasite persistence in the host organism causes chronic endotoxemia, sensitization, immunosuppression, and impaired nutrient absorption (malabsorption) [4, 9]. Given the relatively low sensitivity of conventional coprological examinations in contemporary medical practice, the comprehensive implementation of enzyme-linked immunosorbent assay (ELISA) and instrumental diagnostic criteria, alongside an in-depth analysis of epidemiological risk factors, underscores the extreme urgency of this scientific and practical issue [12, 15].

Metabolic end-products of parasites induce chronic host sensitization, immune suppression, and functional as well as organic damage to digestive system organs [4, 9]. Moreover, chronic endotoxemia and hypoxia diminish tissue regenerative capacity, thereby exacerbating the course of concomitant somatic pathologies [3, 8, 10]. Consequently, timely and accurate diagnosis of parasitoses, alongside the evaluation of their clinical and epidemiological characteristics and transmission factors, constitutes a priority in modern preventive and practical medicine [5, 12, 15]. Contemporary pathophysiological and immunological research demonstrates that parasitic infestations in adults cause not only localized mechanical organ and tissue damage, but also profound systemic alterations throughout the body [4, 10]. Parasite activity and metabolic products disrupt the Th1/Th2 immune balance, triggering immunopathological reactions characterized by chronic sensitization and hypereosinophilia [8, 12]. Furthermore, chronic endotoxemia results in tissue hypoxia and microcirculatory disturbances, decreasing non-specific host resistance [3, 9]. This, in



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turn, leads to frequent relapses of chronic somatic conditions (metabolic disorders, gastrointestinal and hepatic pathologies) among adults and significantly reduces therapeutic efficacy [2, 6].

Another critical challenge in clinical practice is the difficulty of timely and accurate diagnosis of parasitoses in adults. Traditional coprological microscopy methods frequently yield false-negative results due to intermittent parasite shedding, low infection intensity, or improper specimen collection [12, 14]. In tissue and extraintestinal helminthiasis (e.g., echinococcosis, toxocariasis), stool examinations are entirely ineffective. Therefore, the widespread clinical adoption of highly sensitive serological and molecular biological methods, such as enzyme-linked immunosorbent assay (ELISA) and polymerase chain reaction (PCR), combined with instrumental diagnostic modalities like ultrasonography (US) and computed tomography (CT), remains a key imperative [1, 7, 15].

From an epidemiological perspective, modern urbanization, increased population mobility, shifts in food processing, and changes in sanitary-hygienic practices have markedly altered the transmission patterns of parasitic diseases [5, 11, 13]. Currently, the high prevalence of parasitoses among the working-age population (aged 18–60 years) negatively impacts not only individual health status but also societal economic and workforce productivity [14]. Inadequate sanitary-epidemiological surveillance, consumption of contaminated drinking water, and raw or insufficiently processed food maintain high transmission risks, highlighting the need for continuous monitoring of clinical-epidemiological patterns and the optimization of preventive strategies in adult populations [5, 10, 15].

Objective of the study. To perform a statistical analysis of the etiological structure, clinical and epidemiological characteristics, and laboratory-instrumental parameters of parasitic diseases in patients aged 18–60 years, and to improve diagnostic efficiency.

Subject and object of the study. The study involved 250 patients aged 18 to 60 years presenting with confirmed or suspected parasitic infestations, as well as individuals belonging to high-risk groups. The mean age of the patients was 36.4 ± 8.2 years. Gender distribution comprised 118 males (47.2%) and 132 females (52.8%).

The objects of the study included clinical symptom profiles, coprological, serological, and hematological findings, alongside detailed epidemiological anamnesis data.

Research methods. A comprehensive array of diagnostic methods was utilized in this study: Coprological and helminthoscopic methods: Direct stool microscopy, the standardized Kato-Katz technique, the ether-formalin concentration method, and perianal scraping (for enterobiasis). Serological diagnostics: Enzyme-linked immunosorbent assay (ELISA) to detect specific IgG and IgM antibodies against parasites and helminths in blood serum. Hematological analyses: Complete blood count (CBC) evaluating differential white blood cell count, eosinophil level, hemoglobin concentration, and erythrocyte sedimentation rate (ESR). Instrumental methods: Abdominal ultrasonography (US) and, where clinically indicated, esophagogastroduodenoscopy (EGD). Statistical analysis: Data processing was performed using SPSS v26.0 software. Student's t-test was applied for parametric variables, and Pearson correlation coefficients (r) were computed for non-parametric associations. Differences were considered statistically significant at $p < 0.05$.

Results and discussion. Among the 250 enrolled patients, parasitic infestation was definitively confirmed by laboratory and instrumental methods in 214 individuals (85.6%), while clinical, serological, and epidemiological suspicion persisted in 36 patients (14.4%). Analysis of the etiological spectrum revealed that protozoan infections and nematodoses occupied the predominant positions (Table 1).

Parasitic Disease / Etiological Factor	Number of Cases (n)	Percentage (%)
Giardiasis (<i>Giardia lamblia</i>)	96	38.4%
Ascariasis (<i>Ascaris lumbricoides</i>)	55	22.0%



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Echinococcosis (<i>Echinococcus spp.</i>)	36	14.4%
Enterobiasis (<i>Enterobius vermicularis</i>)	32	12.8%
Toxocariasis (<i>Toxocara spp.</i>)	21	8.4%
Total Evaluated Cases	250	100.0%

Table 1. Etiological structure of parasitic diseases in patients (n=250)

Analysis of epidemiological risk factors demonstrated that non-compliance with personal and domestic sanitary-hygienic practices was the primary transmission route in 156 patients (62.4%), consumption of raw or inadequately washed fruits and vegetables in 103 patients (41.2%), close contact with domestic pets (dogs, cats) in 72 patients (28.8%), and use of untreated surface or tap water in 54 patients (21.6%).

Statistics of Clinical Symptoms and Syndromes. The clinical course of parasitoses in adults is characterized by multi-organ involvement and clinical polymorphism. The main clinical symptoms and syndromes observed in patients were systematically analyzed according to their frequency of occurrence.

Dyspeptic syndrome (72.8%) and abdominal pain (66.0%) were the most prevalent manifestations, predominantly recorded in patients with giardiasis (87.5%) and ascariasis (76.3%). Asthenovegetative disorders (59.2%) were confirmed to develop as a consequence of systemic parasitic endotoxemia and impaired absorption of vitamins and essential trace elements (malabsorption).

Laboratory-Instrumental Parameters and Correlation Analysis. Peripheral blood eosinophilia directly correlated with the type and biological activity of the parasitic infestation. Based on eosinophil counts, patients were categorized as follows: Normal range (0–5%): 115 patients (46.0%); Mild eosinophilia (6–10%): 78 patients (31.2%); Moderate eosinophilia (11–20%): 42 patients (16.8%); Severe eosinophilia (>20%): 15 patients (6.0%).

The highest mean eosinophil levels were observed in patients with toxocariasis ($18.4 \pm 2.6\%$) and those in the migratory phase of ascariasis ($14.2 \pm 1.8\%$). The sensitivity of a single coprological examination for giardiasis was low (43.7%), whereas serial three-fold testing combined with the ether-formalin concentration method increased sensitivity to 81.2%. In tissue-invasive helminthiases (echinococcosis and toxocariasis), ELISA demonstrated superior diagnostic value, yielding sensitivities of 91.7% and 95.2%, respectively.

Abdominal ultrasonography identified gallbladder and biliary tract hypotonia with wall thickening in 103 patients (41.2%), hepatomegaly in 81 patients (32.4%), and focal hepatic echinococcal cysts in 36 patients (14.4%). Correlation analysis revealed a strong positive correlation between serum total IgE levels and the percentage of peripheral eosinophils ($r = 0.612, p < 0.001$), as well as a moderate positive correlation between disease duration (chronic course) and the severity of hypochromic anemia ($r = 0.485, p < 0.01$).

These findings indicate that parasitic diseases in adults frequently present under the guise of gastroenterological and allergic conditions [8, 13]. Conventional stool microscopy is insufficient for definitive diagnosis, necessitating the concurrent utilization of serological assays (ELISA) and instrumental methods [12]. The imperative for targeted parasitic screening in adults presenting with prolonged gastrointestinal and allergic manifestations is thus well established [3, 9].

Conclusion. Among patients aged 18–60 years, giardiasis (38.4%) among protozoan infections, and ascariasis (22.0%) and echinococcosis (14.4%) among helminthiases, demonstrate the highest etiological prevalence. The predominant clinical and hematological manifestations of parasitic diseases in adults include dyspeptic syndrome (72.8%), abdominal pain (66.0%), asthenovegetative disorders (59.2%), and peripheral eosinophilia (54.0%). To enhance diagnostic accuracy, a structured diagnostic algorithm integrating repeated concentration methods instead of



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single coprological microscopy, serological ELISA testing, and abdominal ultrasonography is strongly recommended.

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