CLINICAL AND LABORATORY CHARACTERISTICS OF ACUTE DIARRHEA IN PATIENTS

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Abstract: *The monthly analysis of acute diarrhea revealed the presence of seasonal "peaks." Bacterial diarrhea sharply increases at the end of the hot season, particularly in August. Mixed bacterial cases reach relatively high levels in July and October, confirming the seasonal variation in the proportion of mixed infections. Viral cases are relatively high during the winter months, with a tendency to rise again in the autumn; mixed viral cases also show increases corresponding to the autumn months, consistent with the seasonal cycle of viral etiology.*

Keywords: *military serviceman, viral diarrhea, bacterial diarrhea, epidemiology*

Annotatsiya: *O'tkir diareyaning oylar bo'yicha tahlilida mavsumiy "cho'qqi"lar mavjudligini ko'rsatdi. Bakterial diareya yilning issiq davri oxirida, ayniqsa avgust oyida keskin ko'tarilishi kuzatildi. Miks bakterial holatlar iyul va oktyabr oylarida nisbatan yuqori qiymatlarga chiqib, aralash infeksiyalar ulushining mavsumga bog'liq o'zgarishini tasdiqladi. Virusli holatlar qish oylarida nisbatan yuqori bo'lib, kuz davrida qayta o'sish tendensiyasi qayd etildi; miks virusli holatlarda ham kuz oylariga to'g'ri keluvchi ko'tarilishlar kuzatilishi virusli etiologiyaning mavsumiy aylanishi bilan mos keladi.*

Kalit so'zlar: *harbiy xizmatchi, virusli diareya, bakterial diareya, epidemiologiya*

Аннотация: *Анализ острых диарей по месяцам показал наличие сезонных «пиков». Бактериальные диареи резко увеличиваются в конце жаркого сезона, особенно в августе. Смешанные бактериальные случаи достигают относительно высоких значений в июле и октябре, что подтверждает сезонные колебания доли смешанных инфекций. Вирусные случаи относительно высоки в зимние месяцы, с тенденцией к повторному росту осенью; в смешанных вирусных случаях также наблюдаются всплески, совпадающие с осенними месяцами, что соответствует сезонной динамике вирусной этиологии.*

Ключевые слова: военнослужащий, вирусная диарея, бактериальная диарея, эпидемиология

Introduction. Diarrheal syndrome in military personnel can significantly impair their ability to perform various duties, while epidemic outbreaks can rapidly reduce the effectiveness of military operations. Military personnel are at increased risk due to their geographical deployment, the nature of their missions, and, in many cases, altered sanitary conditions. Although acute diarrhea occurring among military personnel was considered for many years to be associated with *Trichinella*, modern epidemiological data make it possible to consider it as a distinct category [1–4].

According to a recent expert analysis, the method of assessing the severity of Tréitz diarrhea should be revised from the traditional approach based solely on the number of episodes toward an outcome-based classification. This change has influenced research into the analysis of Tréitz diarrhea. During military operations conducted under challenging conditions, moderate-severity diarrhea can significantly interfere with the performance of assigned duties.

Studies have shown that antibiotic treatment reduces the duration and severity of diarrhea. At the same time, a recently published systematic review reported that antibiotics are not significantly effective in the treatment of mild and moderate cases of travelers' diarrhea. Investigating the epidemiology and etiology of diarrhea under similarly challenging conditions is complicated by logistical difficulties, including the need to perform microbiological testing and maintain comprehensive documentation [5–7]

Materials and Methods: The study was conducted among 1,046 patients aged 19–45 years who were undergoing treatment with a diagnosis of "Acute Diarrhea" in the Department of Infectious Diseases of the Central Military Hospital, Military Medical Institute, University of Military Security and Defense of the Republic of Uzbekistan. Questionnaire-based survey, clinical examination, epidemiological, and statistical methods were employed.

Discussion and Results. During our study, the epidemiological characteristics of acute diarrheal cases among the patients under observation were assessed based on two indicators: seasonality and the source of the causative agent. During the observation period, the transmission routes of the etiological agents of acute diarrhea were not analyzed, as this aspect has already been comprehensively studied by researchers.

The results obtained demonstrated that acute diarrheal diseases occurred among patients throughout all seasons of the year. During the summer months (June, July, and August), diarrhea caused by bacterial agents was observed more frequently, including

monobacterial and mixed-bacterial diarrhea. In spring and autumn, mixed-viral, mixed-bacterial, and viral-bacterial diarrhea were more frequently recorded. During the winter season, viral diarrhea predominated, particularly monoviral and mixed-viral forms.

In addition, Pearson's correlation coefficient (r) was used to assess the relationship between the monthly dynamics of the different categories. In all analyses, the level of statistical significance was set at $p < 0.05$.

The distribution of infection types by month throughout the year was found to be non-uniform. The results of Pearson's χ^2 test based on the contingency table demonstrated a statistically significant association between month (season) and infection type:

χ^2 (33) = 203.49, $p = 1.93 \times 10^{-26}$, N = 399.

The Cramér's V value, used to assess the strength of the association, was 0.412, indicating a moderate-to-high seasonal effect on the structure of infection etiology. Analysis of the expected frequencies demonstrated that the assumptions required for the application of the χ^2 test were adequately met: among 48 cells, 4 had expected frequencies <5; however, no cell had an expected frequency <1.

Correlation analysis revealed a statistically significant positive correlation between viral and mixed-viral cases (r = 0.704, $p = 0.0106$), indicating that monthly changes in the number of viral cases followed a parallel pattern with the dynamics of mixed-viral cases. Correlations between viral-bacterial, bacterial-mixed-bacterial, and other pairs did not reach statistical significance ($p > 0.05$).

Analysis of the monthly dynamics revealed the presence of seasonal "peaks." A sharp increase in bacterial cases was observed toward the end of the warm period of the year, particularly in August. Mixed-bacterial cases reached relatively high levels in July and October, confirming seasonal variations in the proportion of mixed infections. Viral cases were relatively more frequent during the winter months, with a renewed upward trend observed during the autumn period. Similarly, increases in mixed-viral cases during the autumn months were consistent with the seasonal circulation of viral etiologies.

The findings demonstrated a statistically significant association between month (season) and infection type ($\chi^2(33) = 203.49$, $p < 0.001$). The Cramér's V value of 0.412 indicates that seasonality has a substantial effect on the etiological structure of infections. Furthermore, the statistically significant positive correlation between viral and mixed-viral cases ($r = 0.704$, $p < 0.05$) supports the assumption that the dynamics of cases involving a viral component change in the same direction under the influence of common seasonal factors.

From a practical perspective, during periods of increased seasonal risk—particularly in the months when bacterial and mixed-bacterial cases increase—it is advisable to optimize laboratory diagnostic algorithms, plan healthcare resources accordingly, and strengthen preventive measures.

In general, while food products represented the predominant route of transmission of intestinal infections in the general population, the VD and MVD groups demonstrated a higher proportion of contact transmission and transmission routes that could not be identified. In the BD and MBD groups, however, contamination through food products was found to be predominant.

Thus, several important epidemiological characteristics of acute diarrhea were identified among the patients. First and foremost, seasonality was observed: viral diarrhea predominated in winter, bacterial diarrhea in summer, and mixed diarrhea in autumn and spring. In addition, patients with catarrhal symptoms were identified as the likely source of infection in cases of viral diarrhea, whereas food products were the predominant source of infection for bacterial diarrhea, and water was identified as a potential source in cases involving microbial associations.

At the subsequent stage of our study, the clinical characteristics of acute diarrhea of various etiologies, including viral and bacterial infections and their associations, were investigated using contemporary approaches. Among the 747 patients under observation, the disease had an acute onset in 78.9% (590 patients), while 21.1% (157 patients) presented with a subacute onset.

No statistically significant differences were identified between the groups with regard to disease onset ($p > 0.05$). However, a statistically significant difference was observed between acute and subacute forms of disease onset ($p < 0.05$).

Among the patients included in our study, mild and moderate dehydration were observed at nearly similar rates (36.8% and 32.4%, respectively). At the same time, signs of severe dehydration were recorded in 3.8% of patients. In the remaining 27% of patients, no signs of dehydration were observed, owing to the timely, adequate, and appropriate provision of initial medical care in outpatient or home settings.

Moderate dehydration was most frequently observed in patients with acute diarrhea caused by bacterial and viral pathogens. When the presence and absence of vomiting were compared, the results of the χ^2 analysis revealed statistically significant differences in the BD (42.9%), VVD (10.1%), and BBD (2.4%) groups, with the differences being statistically significant ($p < 0.001$). In patients with VD (32.7%), however, no statistically significant difference was found between the presence and absence of vomiting ($p > 0.05$).

Furthermore, analysis using the χ^2 criterion revealed a statistically significant difference between the groups ($\chi^2 = 81.33$; df = 3; $p < 0.001$). This finding indicates that the observed parameter differs significantly depending on the etiology of diarrhea.

Conclusion: The monthly analysis of acute diarrhea demonstrated the presence of seasonal "peaks." A sharp increase in bacterial diarrhea was observed toward the end of the warm season, particularly in August. Mixed-bacterial cases reached relatively high levels in July and October, confirming seasonal variations in the proportion of mixed infections. Viral cases were relatively more frequent during the winter months, with a renewed upward trend observed during the autumn period. Similarly, increases in mixed-viral cases during the autumn months were consistent with the seasonal circulation of viral etiologies.

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