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SOCIODEMOGRAPHIC AND CLINICAL FEATURES OF COMPLICATED INTRA-ABDOMINAL INFECTIONS IN LABOR MIGRANTS IN A NORTHERN INDUSTRIAL REGION OF RUSSIA

O.K. Safarov[1], A.H. Sultonaliev[1]; F.T. Khalimova[2]
[1]*Lyantor City Hospital, Russian Federation*
[2]*Medico-Social Institute of Tajikistan, Tajikistan*

Corresponding Author: Fariza Tursunbaevna Khalimova

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ANNOTATION

Purpose of the study. To investigate the sociodemographic and clinical characteristics of complicated intra-abdominal infections in patients admitted to a surgical hospital in a northern industrial region of Russia, with special emphasis on labor migrant status and timing of hospitalization.

Material and methods. A single-center prospective descriptive study included 75 adult patients hospitalized with complicated intra-abdominal infections requiring surgical treatment. The study was conducted at the surgical department of Lyantor City Hospital. Eligible patients were older than 18 years and had peritonitis or intra-abdominal abscess with at least one positive intraoperative bacteriological culture obtained from the infectious focus. The analysis included sex, age, migration status, clinical form of infection, underlying nosological structure, and timing of hospital admission. Statistical processing included descriptive statistics and comparative analysis of categorical data using Pearson's chi-square test. Quantitative variables are presented as mean ± standard deviation. Differences were considered statistically significant at $p < 0.05$.

Results. The mean age of the patients was 48.1 ± 5.3 years. Men predominated and accounted for 68.0% of the cohort. Labor migrants working on a rotational basis constituted the majority of the study population, 68.0%, whereas local residents accounted for 32.0%. Peritonitis was the dominant clinical form and was diagnosed in 82.7% of patients, while intra-abdominal abscess was identified in 17.3%. The leading causes of complicated intra-abdominal infections were acute destructive appendicitis, 33.3%, acute destructive pancreatitis, 28.0%, and perforated gastric or duodenal ulcer, 17.3%. Delayed hospitalization, defined as admission more than 24 hours after symptom onset, was observed in 60.0% of patients. Among labor migrants, delayed hospitalization occurred significantly more often than among local residents, 68.6% versus 41.7%, respectively ($\chi^2 = 4.94$; $p = 0.026$).

Conclusion. In a northern industrial region, labor migrants working on a rotational basis represent a high-risk group for delayed access to medical care in the setting of complicated intra-abdominal infections. These findings highlight the need to improve patient routing, early detection of urgent surgical pathology, and locally adapted protocols for high-risk migrant populations.

KEYWORDS: *complicated intra-abdominal infections, labor migration, rotational workers, peritonitis, intra-abdominal abscess, delayed hospitalization, emergency surgery*

INTRODUCTION

Complicated intra-abdominal infections remain among the most severe forms of emergency surgical pathology and are associated with a high risk of septic complications, multiple organ dysfunction, prolonged hospitalization, and considerable treatment costs [1-5]. Despite advances in surgical techniques, antimicrobial therapy, and intensive care, peritonitis and intra-abdominal abscesses continue to impose a substantial clinical and organizational burden on surgical departments [2-6].

This issue is especially relevant in northern industrial regions, where a considerable proportion of the adult population consists of labor migrants employed on a rotational basis. Such patients often work at remote industrial sites, have limited access to primary medical care, and may delay seeking professional help because of organizational, geographic, and social barriers. As a result, surgical diseases may progress to complicated forms before hospital admission.

Although the literature extensively addresses microbiological, therapeutic, and surgical aspects of complicated intra-abdominal infections [1-6], insufficient attention has been paid to the sociodemographic characteristics of patients, particularly in regions with a large population of rotational workers. This gap justifies further study of the clinical profile of these patients, taking into account their labor migration status.

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PURPOSE OF THE STUDY

To investigate the sociodemographic and clinical characteristics of complicated intra-abdominal infections in patients admitted to a surgical hospital in a northern industrial region of Russia, with special emphasis on labor migrant status and timing of hospitalization.

RESEARCH MATERIALS AND METHODS

A single-center prospective descriptive study was conducted at the surgical department of Lyantor City Hospital, Khanty-Mansi Autonomous Okrug - Yugra, Russian Federation. The study included 75 patients older than 18 years with complicated intra-abdominal infections requiring surgical treatment. Complicated intra-abdominal infections were represented by peritonitis and intra-abdominal abscesses. Inclusion required at least one positive bacteriological culture obtained intraoperatively from the infectious focus.

Inclusion Criteria: age older than 18 years; complicated intra-abdominal infection requiring surgery; positive bacteriological culture from the abdominal infectious focus.

Exclusion Criteria: negative bacteriological culture; incomplete medical records; infections associated with a foreign body as the primary source.

The following variables were analyzed: age, sex, migration status, clinical form of infection, nosological structure of the disease, and time from symptom onset to hospital admission.

Patients were divided into two major social groups, local residents and labor migrants employed on a rotational basis. Hospitalization timing was categorized as admission within the first 24 hours or later than 24 hours after disease onset.

Statistical analysis was performed using descriptive statistical methods. Quantitative variables are presented as mean ± standard deviation, whereas categorical variables are shown as absolute numbers and percentages. Pearson's chi-square test was used to compare proportions between groups. Differences were considered statistically significant at $p < 0.05$.

RESEARCH RESULTS

To provide a general characterization of the study sample, the main sociodemographic and clinical parameters of patients with complicated intra-abdominal infections were analyzed. Particular interest was focused on sex distribution, migration status, clinical form of the infectious process, and timing of hospitalization, since these indicators provide an integral view of the patient profile in a surgical hospital of a northern industrial region. The main clinical and demographic characteristics of the cohort are presented in Table 1.

Table 1. Clinical and demographic characteristics of the study cohort

Variable	n	%
Male patients	51	68.0
Labor migrants (rotational workers)	51	68.0
Local residents	24	32.0
Peritonitis	62	82.7
Intra-abdominal abscess	13	17.3
Hospitalization within first 24 hours	30	40.0
Hospitalization later than 24 hours	45	60.0

As shown in Table 1, the cohort was dominated by working-age men and by patients who were labor migrants employed on a rotational basis. Peritonitis predominated in the clinical structure of complicated intra-abdominal infections, indicating a high frequency of diffuse and clinically more severe forms of the infectious process. Attention should also be paid to the considerable proportion of patients hospitalized later than 24 hours after disease onset, which already at the stage of general cohort characterization suggests the presence of organizational and social factors contributing to delayed admission.

For a more detailed assessment of the structure of complicated intra-abdominal infections, patients were analyzed according to the main nosological forms and the type of infection. This approach made it possible to identify the most frequent underlying diseases and to determine the relationship between peritonitis and intra-abdominal abscesses, as well as between community-acquired and nosocomial infections. The corresponding data are presented in Table 2.

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Table 2. Distribution of patients according to nosological form and infection type

Nosological Form	Total, n (%)	Peritonitis, n (%)	Abscess, n (%)	Community-acquired, n (%)	Nosocomial, n (%)
Acute Destructive Appendicitis	25 (33.3)	23 (92.0)	2 (8.0)	24 (96.0)	1 (4.0)
Acute Destructive Pancreatitis	21 (28.0)	17 (81.0)	4 (19.0)	12 (57.1)	9 (42.9)
Perforated Gastric/Duodenal Ulcer	13 (17.3)	12 (92.3)	1 (7.7)	10 (76.9)	3 (23.1)
Malignant Tumors With Complications	5 (6.7)	2 (40.0)	3 (60.0)	3 (60.0)	2 (40.0)
Acute Intestinal Obstruction	4 (5.3)	3 (75.0)	1 (25.0)	3 (75.0)	1 (25.0)
Acute Destructive Cholecystitis	3 (4.0)	2 (66.7)	1 (33.3)	2 (66.7)	1 (33.3)
Abdominal Injuries	2 (2.6)	2 (100.0)	0	2 (100.0)	0
Mesenteric Vessel Thrombosis	2 (2.6)	1 (50.0)	1 (50.0)	1 (50.0)	1 (50.0)

According to Table 2, the leading causes of complicated intra-abdominal infections were acute destructive appendicitis, acute destructive pancreatitis, and perforated gastric or duodenal ulcer. In most nosological categories, peritonitis predominated, confirming the high frequency of generalized inflammatory forms. It should be noted that patients with malignant tumors and complications demonstrated a relatively higher proportion of intra-abdominal abscesses, which may reflect features of pathogenesis, delayed diagnosis of the underlying disease, and the complexity of clinical course. In addition, some nosological forms, especially acute destructive pancreatitis, were characterized by a substantial proportion of nosocomial infections, which is important for antimicrobial management and evaluation of risk factors for unfavorable outcomes.

One of the key aspects of the present study was the assessment of hospitalization timing, since delayed admission to a surgical department may contribute to worsening of the infectious process, progression of peritonitis, and abscess formation. Therefore, a separate analysis of delayed hospitalization indicators was performed, including comparison between labor migrants and local residents with regard to the frequency of delayed medical care seeking. The results of this analysis are presented in Table 3.

Table 3. Delayed hospitalization indicators and statistical significance of differences

Variable	Value
Patients Admitted Later Than 24 Hours	45 of 75 (60.0%)
Rotational Workers Among Those Admitted Late	35 of 45 (77.8%)
Delayed Hospitalization Among Rotational Workers	35 of 51 (68.6%)
Delayed Hospitalization Among Local Residents	10 of 24 (41.7%)
Statistical Significance of Differences	$\chi^2 = 4.94$; $p = 0.026$
Most Frequent Conditions in Delayed Admission	Tumor-related complications, appendicitis, pancreatitis

As shown in Table 3, delayed hospitalization was characteristic of a substantial proportion of patients and was observed in 60.0% of cases. Importantly, rotational workers predominated among patients admitted later than 24 hours after symptom onset. Comparative analysis demonstrated that delayed hospitalization occurred significantly more often among labor migrants than among local residents, 68.6% versus 41.7%, respectively ($\chi^2 = 4.94$; $p = 0.026$). These findings suggest that labor migration should be regarded as a substantial social and organizational risk factor for delayed surgical care. Most likely, remoteness of the workplace, limited medical accessibility, routing issues, and delayed referral to hospital contribute significantly to the more severe clinical condition at the time of admission.

DISCUSSION

The present study demonstrates that in a northern industrial region, patients with complicated intra-abdominal infections are predominantly working-age men, and a substantial proportion of them are labor migrants employed on a rotational basis. This gives the problem not only clinical but also marked social and organizational relevance.

The predominance of peritonitis in the structure of complicated intra-abdominal infections is consistent with current understanding of the clinical profile of this pathology [3-5]. At the same time, the high proportion of delayed hospitalization indicates that in many patients the disease had already progressed to an advanced stage by the time of admission to the surgical department.

Particular attention should be paid to the fact that delayed hospitalization among rotational workers was significantly more frequent than among local residents, 68.6% versus 41.7%, respectively ($\chi^2 = 4.94$; $p = 0.026$). Possible explanations include the remoteness of work sites from medical institutions, limited access to primary care, attempts at symptomatic self-treatment, and delays in routing

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at the prehospital stage. Therefore, labor migrant status in northern regions should be regarded as an important factor associated with an unfavorable organizational and clinical profile.

The distribution of nosological forms is also practically important. Delayed presentation was most common in patients with appendicitis, pancreatitis, and tumor-related complications. For these categories of patients, timely recognition of early symptoms and rapid referral to a specialized surgical unit are especially important. In this context, both clinical and administrative solutions are required, including better routing systems, training of healthcare personnel working at remote industrial sites, and increased surgical alertness regarding workers from rotational settlements.

Thus, the results indicate that sociodemographic characteristics, primarily migration and employment status, should be taken into account when planning surgical care and when analyzing factors contributing to complicated forms of intra-abdominal infection.

PRACTICAL SIGNIFICANCE

The practical significance of the study lies in identifying labor migrants employed on a rotational basis as a specific high-risk group for delayed hospitalization and complicated clinical course of intra-abdominal infections. The findings may be used to improve routing of patients from remote industrial facilities, develop local algorithms for early referral to surgical departments, increase clinical alertness toward abdominal surgical pathology among rotational workers, and optimize organizational approaches in surgical hospitals of northern regions.

STUDY LIMITATIONS

This study has several limitations. First, it was conducted in a single center, which restricts the generalizability of the findings to other regions. Second, the sample size was relatively small. Third, the study was descriptive in nature and did not include multivariable statistical analysis, which limits the ability to establish causal relationships between migration status and disease severity. In addition, only patients with positive bacteriological cultures were included, which may have influenced the composition of the study cohort.

CONCLUSION

In a northern industrial region of Russia, complicated intra-abdominal infections were most commonly observed in working-age men, with a predominance of labor migrants employed on a rotational basis. Peritonitis was the main clinical form, while the leading underlying causes were acute destructive appendicitis, acute destructive pancreatitis, and perforated gastric or duodenal ulcer. More than half of the patients were hospitalized later than 24 hours after symptom onset, and delayed hospitalization was significantly more frequent among labor migrants than among local residents. These findings underline the need for improved early diagnosis, more efficient transport and referral pathways, and adaptation of local surgical care protocols to the specific characteristics of migrant labor populations in northern industrial regions.

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AUTHOR INFORMATION

1. O.K. Safarov - Head of the Surgical Department, Lyantor City Hospital, Russian Federation.
2. A.H. Sultonaliev - Surgeon, Lyantor City Hospital, Russian Federation.
3. F.T. Khalimova - Professor, Medico-Social Institute of Tajikistan, Tajikistan. E-mail: farizakhalimova@gmail.com