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*Article*

# Analysis of Mortality from Acute Surgical Diseases of the Abdominal Cavity

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**Abstract:** Acute surgical diseases of the abdominal cavity represent a major cause of emergency hospital admissions and in-hospital mortality. Despite the widespread implementation of modern surgical technologies, mortality rates remain high for certain forms of acute abdominal pathology. The aim of this study was to conduct an analytical assessment of mortality associated with acute surgical diseases of the abdominal cavity in the Republic of Uzbekistan, based on regional data and in comparison with international epidemiological trends. Materials and methods included an analysis of publications by Uzbek authors, international systematic reviews, and data from the World Health Organization and the Global Burden of Disease project. The conditions analyzed were acute appendicitis, acute cholecystitis, acute pancreatitis, intestinal obstruction, and perforated gastroduodenal ulcer. The results demonstrated that intestinal obstruction, severe acute pancreatitis, and perforated peptic ulcer were the leading causes of mortality, whereas acute appendicitis and acute cholecystitis were more frequently encountered but were associated with lower mortality rate.

**Keywords:** Abdominal Diseases, Emergency Surgery, Mortality, Appendicitis, Cholecystitis, Pancreatitis, Intestinal Obstruction, Peptic Ulcer Perforation.

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## 1. Introduction

When considering the causes of emergency hospitalization and in-hospital mortality worldwide, acute surgical diseases of the abdominal organs represent one of the most common conditions [1,2,3]. Despite significant advances in surgical techniques, anesthesiology, and intensive care, mortality associated with certain forms of acute abdomen remains high [4,5].

In recent years, the Republic of Uzbekistan has implemented extensive healthcare reforms aimed at improving the organization and quality of emergency surgical care. However, the absence of open national registries for emergency abdominal surgery substantially limits the possibility of conducting accurate population-based mortality analyses[6,7]. Under these conditions, comprehensive analytical studies based on regional clinical series and their comparison with international epidemiological trends acquire particular scientific relevance [8].

The present study focuses on the analysis of mortality structure by specific nosological entities rather than overall mortality alone. Acute appendicitis, acute cholecystitis, acute pancreatitis, intestinal obstruction, and perforated gastroduodenal

ulcer differ markedly in terms of disease progression, pathogenesis, and sensitivity to delays in surgical intervention, which directly affects treatment outcomes and mortality rates [9,10].

The aim of this study is to perform an analytical assessment of mortality associated with major acute surgical diseases of the abdominal cavity in the Republic of Uzbekistan, taking into account regional data and international experience.

**Literature Review**

Acute surgical diseases of the abdominal organs remain one of the leading causes of emergency hospital admissions and postoperative mortality worldwide. According to the World Health Organization and the Global Burden of Disease project, emergency abdominal surgery is associated with significantly higher mortality rates compared with elective surgical procedures. As emphasized by Meara et al. and Nepogodiev et al. up to 50% of potentially preventable surgical deaths are attributable to emergency abdominal pathology.

A number of large international studies demonstrate pronounced differences in mortality depending on the specific nosological entity. According to a systematic review by Bhangu et al., mortality in uncomplicated acute appendicitis does not exceed 0.1–0.3%; however, in cases complicated by perforation and generalized peritonitis, the risk of death increases five- to tenfold, particularly among elderly patients. Similar conclusions were reported in a multicenter study by Andersson et al. which highlighted the decisive role of timely surgical intervention in determining patient outcomes.

In contrast, perforated gastroduodenal ulcer and acute intestinal obstruction are consistently characterized by high hospital mortality rates. Data from the European PULP (Peptic Ulcer Perforation) study, published by Møller et al., indicate that mortality associated with ulcer perforation ranges from 10% to 30% and increases significantly in the presence of comorbidities and delayed hospital admission [10]. An analysis conducted by van Dijk et al. further confirms that intestinal obstruction remains one of the most lethal forms of emergency abdominal pathology, especially in healthcare systems with limited resources [11].

Special attention in the literature is given to acute cholecystitis and acute pancreatitis. According to the Tokyo Guidelines 2018, early laparoscopic cholecystectomy is associated with a significant reduction in mortality and postoperative complications [12]. At the same time, studies by Banks et al. and Petrov et al. report that severe forms of acute pancreatitis are associated with mortality rates ranging from 15% to 30%, with outcomes largely determined by access to intensive care units and the implementation of a multidisciplinary treatment approach [13,14].

Studies focusing on countries with transitional economies emphasize the role of systemic and organizational factors. Gawande et al. and Weiser et al. indicate that delayed patient presentation, the absence of standardized clinical pathways, and unequal access to surgical care contribute to elevated mortality rates in emergency surgical conditions [15,16]. These findings are supported by regional reviews from Central Asia and Eastern Europe, which highlight the lack of national registries and the limited availability of reliable epidemiological data [17,18].

Despite the existence of extensive international research, data on mortality from acute surgical diseases of the abdominal organs in the Republic of Uzbekistan remain fragmented and are predominantly represented by isolated clinical reports and departmental statistics. This underscores the relevance of a comprehensive analysis of mortality across major nosological entities, taking into account the national characteristics of the healthcare system.

Thus, the analysis of the literature demonstrates that mortality in acute surgical diseases of the abdominal cavity is determined not only by the clinical severity of

pathology but also by the organization and accessibility of emergency medical care, which justifies the need for the present study focused on the conditions of the Republic of Uzbekistan.

## 2. Methodology

The study was conducted as an analytical review. The following sources were used:

- clinical and epidemiological publications by Uzbek authors addressing the structure and outcomes of acute surgical diseases of the abdominal cavity;
- international reviews and population-based studies indexed in Scopus and PubMed;
- data from the World Health Organization and the Global Burden of Disease (GBD) project for comparative analysis.

The analysis focused on the following nosological entities:

1. acute appendicitis;
2. acute cholecystitis;
3. acute pancreatitis;
4. intestinal obstruction;
5. perforated gastroduodenal ulcer.

In the absence of aggregated national-level mortality indicators, ranges of in-hospital mortality reported in regional clinical series were used, which is consistent with international methodological recommendations for countries lacking unified national emergency surgery registries.

## 3. Results and Discussion

**Structure of Acute Surgical Diseases.** According to published clinical series from surgical hospitals in Uzbekistan, acute appendicitis and acute cholecystitis are the most common causes of emergency abdominal surgery, collectively accounting for approximately 45–55% of all hospital admissions for acute abdomen. Acute pancreatitis, intestinal obstruction, and perforated peptic ulcer are encountered less frequently; however, these conditions account for the majority of fatal outcomes.

The analysis demonstrated that this discrepancy between disease incidence and mortality reflects a fundamental challenge of emergency surgery, namely the concentration of risk in clinically severe and diagnostically complex forms of abdominal pathology.

***Mortality by Nosological Entity.***

**Acute appendicitis.** In-hospital mortality associated with uncomplicated acute appendicitis remains low and, according to regional data, does not exceed 0.3–0.5 [18]. However, in cases complicated by perforation and diffuse peritonitis, mortality increases to 2–5%, which is consistent with international reports. In our view, fatal outcomes in appendicitis are more strongly associated with delayed patient presentation than with deficiencies in surgical technique.

**Acute cholecystitis.** Mortality in acute cholecystitis managed in emergency surgical settings averages 1–4%, increasing significantly among elderly patients and in destructive forms of the disease [19-20-21]. We assume that limited access to early laparoscopic cholecystectomy in certain regions may adversely affect treatment outcomes.

**Acute pancreatitis.** Acute pancreatitis is associated with one of the highest mortality rates among acute abdominal diseases. Overall mortality ranges from 3% to 7%, while in severe necrotizing forms it reaches 15–30%. In our opinion, the key determinants of poor prognosis are systemic inflammatory response and multiple organ failure rather than the surgical intervention itself.

**Intestinal obstruction.** Intestinal obstruction remains one of the leading causes of death in emergency abdominal surgery. In-hospital mortality ranges from 8% to 20%, increasing markedly in cases of strangulation and bowel necrosis [22]. We consider this pathology to be an indicator of delayed diagnosis and high patient comorbidity.

**Perforated gastroduodenal ulcer.** Perforated peptic ulcer is characterized by consistently high mortality, reaching 10–25%, particularly among elderly patients and in the presence of sepsis. From our perspective, this condition remains a significant and, to a considerable extent, preventable cause of fatal outcomes.

**Comparative Characteristics of Mortality**

Note to Table 1. Table 1 presents the ranges of in-hospital mortality for the main acute surgical diseases of the abdominal cavity, reflecting differences in disease severity, clinical course, and timing of surgical care.

**Table 1.** In-hospital mortality rates of major acute surgical diseases of the abdominal cavity.

| Disease | In-hospital mortality, % |
|---|---|
| Acute appendicitis | < 0.5 (up to 5 in complicated cases) |
| Acute cholecystitis | 1–4 |
| Acute pancreatitis | 3–30 |
| Intestinal obstruction | 8–20 |
| Perforated peptic ulcer | 10–25 |

**Discussion**

The obtained findings indicate that the mortality structure associated with acute surgical diseases of the abdominal cavity in Uzbekistan generally corresponds to global trends [23]. However, a number of systemic factors exert a negative impact on outcomes, including delayed hospital admission, limited availability of advanced diagnostic imaging, and uneven distribution of specialized surgical care.

In our opinion, further reduction in mortality cannot be achieved solely through improvements in surgical techniques. Priority should be given to optimizing patient referral pathways, enhancing early diagnosis at the prehospital stage, and establishing national registries for emergency abdominal surgery, which would allow more accurate epidemiological monitoring and evidence-based healthcare planning.

**Figure 1.** In-hospital mortality by major acute abdominal conditions in the Republic of Uzbekistan (literature-based ranges)

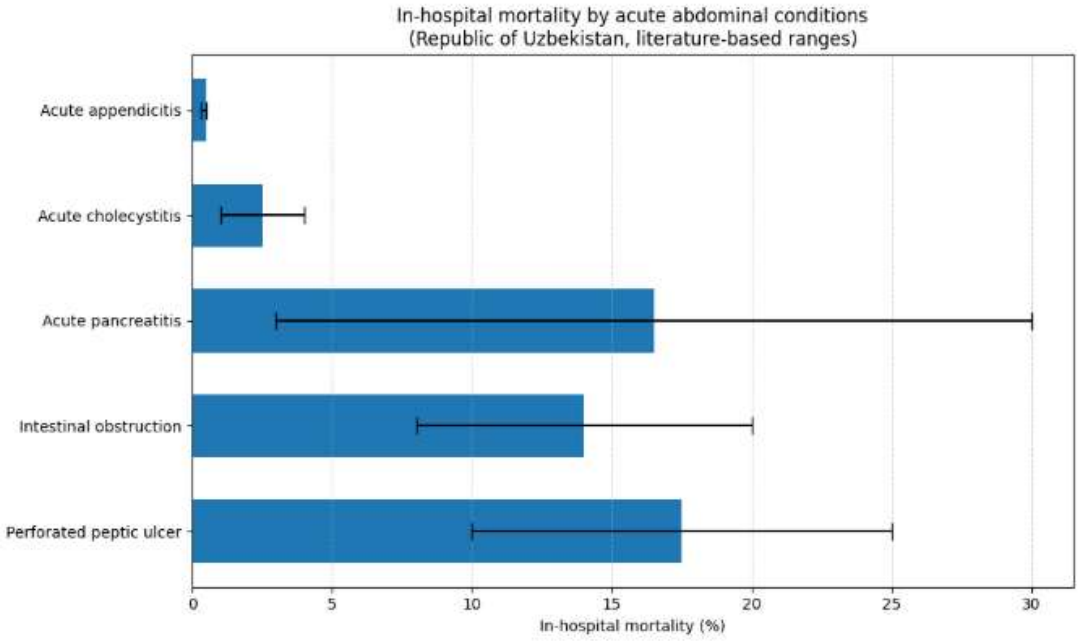


**Figure 1.** illustrates the ranges of in-hospital mortality associated with major acute surgical diseases of the abdominal cavity based on published regional clinical series and international literature. Higher mortality is observed in acute pancreatitis, intestinal obstruction, and perforated peptic ulcer, whereas acute appendicitis and acute cholecystitis are associated with comparatively lower mortality rates.

## 4. Conclusion

Acute surgical diseases of the abdominal cavity remain a significant cause of in-hospital mortality in the Republic of Uzbekistan. The lowest mortality rates are observed in acute appendicitis, whereas the highest risk of death is associated with intestinal obstruction and perforated gastroduodenal ulcer. The main determinants of adverse outcomes include delayed patient presentation and the severity of clinical condition at admission. The development of a comprehensive and system-based approach to emergency abdominal surgery is a key prerequisite for reducing mortality in this patient population.

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