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Diagnosis and early prediction of the outcome of generalized peritonitis

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Objective: To study of etiological factors that determine unfavorable treatment outcomes in patients with generalized peritonitis.

Patients and Methods: A total of 188 patients with widespread peritonitis were examined. The diagnosis was established clinically by objective examination, confirmed radiologically by detecting free air under the diaphragm and/or free fluid in the abdominal cavity by ultrasound, as well as by the results of additional research methods.

Results: Most patients 137 (72.9%) were hospitalized within 24 hours of illness. Abdominal pain as the most common symptom was diagnosed in 180 (95.7%) patients with peritonitis. Shock was recorded in 11 patients (5.8%) with systolic blood pressure below 90 mmHg and heart rate above 100 beats per minute. Fever was detected in 39 patients (20.7%). The average length of hospital stay was 11.5 days; the longest hospital stay was 37 days and the shortest was 1 day.

The most common etiologic factors of secondary widespread peritonitis are perforation of gastroduodenal ulcers (n=70; 37.2%), acute intestinal obstruction (n=54; 28.7%), destructive appendicitis (n=46; 24.5%). Among the many clinical and laboratory factors that influence mortality, the authors highlight the most significant ones: severe concomitant diseases, the stage of peritonitis and postoperative complications that cause death.

Conclusion: Severe concomitant diseases and postoperative complications cause death and, therefore, upon admission of patients, a thorough anamnesis must be collected to identify severe concomitant diseases in order to take timely measures to prevent postoperative complications and death.

Key words:
generalized peritonitis, perforation of gastroduodenal ulcers, acute intestinal obstruction, destructive appendicitis, fatal outcome, prognostic factors

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Диагностика и раннее прогнозирование исхода распространённого перитонита

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Цель исследования – изучение этиологических факторов, обуславливающих неблагоприятный исход лечения пациентов с распространённым перитонитом.

Пациенты и методы. Были обследованы 188 пациентов с распространённым перитонитом. Диагноз устанавливался клинически при объективном исследовании, подтверждался рентгенологически при обнаружении свободного воздуха под диафрагмой и/или свободной жидкости в брюшной полости на УЗИ, а также по результатам дополнительных методов исследования.

Результаты. Большинство пациентов 137 (72,9%) были госпитализированы в течение 24 часов с момента заболевания. Боль в животе как наиболее частый симптом была диагностирована у 180 (95,7%) пациентов с перитонитом. У 11 (5,8%) пациентов был зафиксирован шок с систолическим артериальным давлением ниже 90 мм рт. ст. и частотой сердечных сокращений выше 100 ударов в минуту. У 39 (20,7%) пациентов была выявлена лихорадка. Средняя продолжительность пребывания в больнице составила 11,5 дней; самая большая продолжительность пребывания в больнице составила 37 дней, а самая короткая — 1 день.

Наиболее частыми этиологическими факторами вторичного распространённого перитонита являются перфорация гастродуоденальных язв (n=70; 37,2%), острая кишечная непроходимость (n=54; 28,7%), деструктивный аппендицит (n=46; 24,5%). Среди множества клинических и лабораторных факторов, влияющих на летальность, авторы выделяют наиболее значимые: тяжёлые сопутствующие заболевания, стадию перитонита и послеоперационные осложнения, которые обуславливают летальный исход.

Заключение. Тяжёлые сопутствующие заболевания и послеоперационные осложнения обуславливают летальный исход и, следовательно, при поступлении больных необходим тщательный сбор анамнеза для выявления тяжёлых сопутствующих заболеваний с тем, чтобы своевременно принимать меры для предотвращения послеоперационных осложнений и летального исхода.

Ключевые слова:

распространённый перитонит, перфорация гастродуоденальных язв, острая кишечная непроходимость, деструктивный аппендицит, летальный исход, прогностические факторы

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Relevance. Generalized peritonitis is a severe pathological condition and is conventionally divided into three large groups: primary, secondary and tertiary depending on the source and nature of microbial contamination [1].

Secondary peritonitis, which develops against the background of purulent-inflammatory diseases of the abdominal organs and perforation of hollow organs, is one of the most common and dangerous complications worldwide, and this is associated with a high level of morbidity and mortality [2-5]. Due to the violation of the epithelial integrity of the peritoneum, bacterial pathogens move into the abdominal cavity, provoking, in the absence of adequate therapeutic measures, a cascade of inflammatory reactions, multiple organ failure, sepsis and death [1, 6]. Intensive care and timely surgical intervention are essential links in the treatment process designed to improve the outcome of treatment of such a formidable pathology [1, 5-7].

In recent years, the length of hospital stay of patients with secondary generalized peritonitis has increased, as well as the number of complications such as intestinal fistulas, surgical infections, and sepsis. Despite certain advances in surgery, antibacterial treatment, and intensive care, treatment of peritonitis remains an extremely difficult and complex task [2, 8]. Early prediction of the outcome of generalized peritonitis provides an objective assessment of the severity of the disease and the selection of high-risk patients for more intensive therapeutic procedures [3, 9]; and this is especially true for patients who seek medical attention late, who are the majority, and it should be remembered that in this situation, the management of such patients is fraught with unpredictable consequences [9, 10].

Objective research – To study of etiological factors that determine unfavorable treatment outcomes in patients with generalized peritonitis.

Patients and Methods. A total of 188 patients with generalized peritonitis were examined in the surgical departments of the State Institution "Central Emergency Medical Care Center" of Dushanbe from the beginning of 2014 to the end of 2024.

Before the operation, all patients received preoperative preparation in the intensive care unit, which included: infusion therapy, intravenous correction of water and electrolyte disorders; nasogastric intubation and urethral catheterization, administration of broad-spectrum antibiotics according to the protocol of the State Institution "Central Emergency Medical Care Center" of Dushanbe. Additional research methods included determining the level of hemoglobin, red blood cells, white blood cells, blood group and Rh factor, biochemical blood test, plain radiography of the abdominal cavity and chest, as well as ultrasound of the abdominal cavity. When clinical and hemodynamic parameters were stabilized, patients underwent laparotomy under general anesthesia.

The diagnosis of generalized peritonitis was established clinically by objective examination, confirmed radiologically by detection of free air under the diaphragm and/or free fluid in the abdominal cavity by ultrasound. During surgery, pathological contents of the abdominal cavity were taken for histopathological analysis.

Results and discussion. A total of 188 patients were diagnosed with generalized peritonitis. The female to male ratio was 1:1.5. There were 75 women (40%) and 113 men (60%). The average age of the patients was 38.5 years (range, 15–81 years).

Most patients 137 (72.9%) were hospitalized after 24 hours from the

moment of illness. Abdominal pain as the most common symptom was diagnosed in 180 (95.7%) patients with peritonitis. 11 (5.8%) patients were in shock with systolic blood pressure below 90 mm Hg and heart rate above 100 beats per minute; 39 (20.7%) patients had fever (Table 1).

The average length of hospital stay was 11.5 days; the longest length of hospital stay was 37 days and the shortest was 1 day (Table 2).

The etiological components of secondary generalized peritonitis in the State Institution "Central Emergency Medical Care Center" of Dushanbe are perforation

of a hollow organ (usually gastroduodenal ulcers) - 70 (37.2%), acute intestinal obstruction - 54 (28.7%), destructive appendicitis - 46 (24.5%) patients and are considered by us as the most common causes of secondary generalized peritonitis.

Ulcer perforation may be caused by poor sanitary conditions, which makes patients susceptible to *Helicobacter pylori* infection, which in turn can lead to perforation.

Acute intestinal obstruction occurs as an adverse consequence of adhesive disease of the abdominal cavity, dolichosigma, hernias. The strangulation form of acute intestinal obstruction is more common.

Table 1. Data from a study of patients with generalized peritonitis

Characteristic			Quantity (%) or average (range)
Symptoms	Vomit	Yes	81 (43)
		No	107 (57)
	Stomach ache	Yes	180 (95,7)
		No	8 (4,3)
	Diarrhea	Yes	7 (3,7)
		No	181(96,3)
	Constipation	Yes	31 (16,5)
		No	157 (83,5)
	Dehydration	Yes	4 (2,1)
		No	184 (97,9)
Signs	Systolic blood pressure	≤90 mmHg	40 (21,3)
		>90 mmHg	148 (78,7)
	Pulse	≤100 bpm	66 (35,1)
		>100 bpm	122 (64,9)
	Respiratory rate	Below 25 dd/min	170 (90,4)
		Above 25 dd/min	18 (9,6)
	Body temperature	36-38 C	174 (92,6)
		Above 38 C	14 (7,4)
Associated diseases	Yes		57 (30,3)
	No		131 (69,7)
Leukocytosis			9.3(4-16,8)
X-ray of the abdominal cavity	Norm		101 (53,7)
	Pathology		87 (46,3)
Ultrasound of the abdominal cavity	There is free liquid		182 (96,8)
	There is no free liquid		6(3,2)

Table 2. Treatment outcomes of patients with generalized peritonitis

Parameters		Quantity (%) or average (range)
Complications	Yes	56 (29,8)
	No	132 (70,2)
Types of complications	Wound suppuration	36 (19,1)
	Divergence of the edges of the p/o wound	11 (5,9)
	Septicemia	9(4,)
Survivors	Yes	150(79,8%)
	No	38 (20,2%)
Length of hospital stay		11,5(1-37)

Note: Premorbid comorbidities and postoperative complications significantly influence mortality rate (p values <0.005 and <0.001, respectively).

Destruction and subsequent perforation of the appendix usually occurs when using incorrect tactics in outpatient medical institutions or self-medication.

But in almost all cases, late referral (later than 24 hours from the onset of the disease) of patients to the hospital is recorded, which is an important factor in increasing the severity of the patient's condition by the time of admission to the hospital.

In our study, severe comorbidities, peritonitis stage and postoperative complications could statistically predict mortality. This may be the case when the severity of the patient's surgical status may give less importance to comorbidities and thus these premorbid diseases may be missed, which in turn may cause an unfavorable outcome.

Thus, based on the results of this study, we emphasize the need for careful history taking to identify potential premorbid comorbidities, and responsible surgeons should make every effort to prevent postoperative complications. The development of complications in the postoperative period, particularly abdominal sepsis, contributes to an increase in mortality. Sociodemographic factors such as age, gender, and clinical symptoms such

as vomiting and fever did not significantly predict adverse outcome in our study.

Conclusion. The most common etiologic factors of secondary generalized peritonitis are perforation of gastroduodenal ulcers, acute intestinal obstruction, destructive appendicitis. Severe concomitant diseases and postoperative complications cause death and, therefore, upon admission of the patient, a thorough anamnesis is necessary to identify severe concomitant diseases in order to take timely measures to prevent postoperative complications and subsequent death. In addition, it is advisable to conduct a study to study the remote results in patients with secondary generalized peritonitis.

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