ABDOMINAL HYPERTENSION AND THE ABDOMINAL COMPARTMENT SYNDROME IN PATIENTS WITH SECONDARY PERITONITIS

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The dynamic of intra-abdominal pressure in the postoperative period was studied in 97 patients with generalized peritonitis. The dependence between the severity of intra-abdominal hypertension, the cause and severity, and the defining the nature of changes in intra-abdominal pressure in relation to clinical manifestations and laboratory studies has been established. The possibility to use indicators of abdominal pressure has been shown as a category of assessment and prediction of postoperative course.

Keywords: generalized peritonitis, intra-abdominal hypertension, multiple organ failure syndrome and abdominal compartment syndrome

The treatment of patients with peritonitis remains an urgent problem in surgery despite the development of new surgical technologies and the success of pharmacology. Great attention has been paid lately to intra-abdominal hypertension (IAH) and abdominal compartment syndrome (ACS) in common peritonitis as factors of multiple organ failure syndrome (MOFS) [1-8]. However, there are no data on the performance of intra-abdominal hypertension at different pathology and the frequency of ACS. There are not enough studies on the relationship between the severity of ACS with endogenous intoxication and MODS.

The purpose: we have to study the data of intra-abdominal hypertension and the frequency of in ACS patients with acute abdominal pathology.

Materials and methods of research

We have studied the course of disease in 97 patients with widespread peritonitis who were treated in the Civil Emergency Care Hospital in Krasnodar in 2011. The average patient age was 55,9 ± 16,7 years. The severity of the state of the patients and the dynamics of infectious-toxic process in the abdominal cavity was evaluated on the scale of APACHE II, SAPS II, Mannheim peritonitis index (MPI). The integral scale of SOFA was used to dynamically determine the severity of multiple organ dysfunctions and the effectiveness of therapeutic interventions. The dynamics of intra-abdominal pressure (IAP) was determined indirectly by the change of pressure in the cavity of the bladder through a catheter with apparatus Uno Meter Abdo Pressure® Kit.

Results of research and their discussion

Perforated duodenal ulcer – 32 (%) and acute intestinal obstruction – 27 (%) are a common cause of diffuse peritonitis. Strangulated hernia with necrosis of entrapment and perforation of the colon, respectively, were identified in 15 and 9 (%) cases. Other causes of diffuse peritonitis were abdominal injuries – 6 (%), perforation of the small intestine – 5 (%), and acute appendicitis – 3 (%). The increasing levels of IAH preoperatively were detected in all the patients. High levels of IAP were reported in patients with acute intestinal obstruction – 25,6 ± 2,4 mm Hg and the perforation of the colon – 22,2 ± 3,9 mm Hg (Table 1). It can be stipulated by the peculiarities of the disease in a pronounced paresis of the small intestine, and enteric insufficiency in the case of acute intestinal obstruction. In patients with colon perforations the high level of IAP was determined by the severity of peritonitis, with the predominance of fecal forms. This phenomenon is confirmed by the fact that the severity of abdominal hypertension correlates with the indices of the integral scales of APACHE II, SAPS II, as well as the IAP (Table 2). The worst performance of gravity of the infectious-toxic process is obtained in patients with acute intestinal obstruction and perforation of the colon. In other observations, the level of IAP corresponds to the hypertension of moderate severity in the range of 11,7 ± 1,6 to 19,9 ± 2,8 mm Hg.

The symptoms of multiple organ dysfunction before surgery were detected only at 11 (11,3%) patients, 7 (4,1%) of them with acute intestinal obstruction, and 4 with perforations of the colon. At the same time, the data of SOFA proved the development of MOFS in the postoperative period in most patients with generalized peritonitis. The patients were divided in 2 groups in the postoperative period. The first group consisted of 79 (81,4%) patients with uncomplicated postoperative period. The second group included 14 (14,4%) patients with intra-abdominal complications in the form of failure of the intestinal suture and 4 (4,2%) patients with progression of peritonitis in the postoperative period.

In the first group IAP decreased significantly on the first day after surgery ($p < 0,05$). The positive changes of the postoperative course were characterized by lower estimates of APACHE II and SAPS II. Over the next 2-3 days after surgery, % of patients had a small increase in IAP due to the paresis of the intestine, but these figures do not exceed 15 mm Hg (Figure). In a few patients with the longer postoperative paresis after 2-3 days of IAH there appeared some signs of multiple

organ dysfunction in the form of increased levels of creatinine, urea, AST, ALT. The content of middle weight toxins in the blood has also increased. Within 3-4 days, however, the level of IAP gradually decreased. The level of IAP was close to 0-5 mm by the 6-7 day of the postoperative period in 73 (92,4%) patients. There wasn't any noticeable development of ACS with MOFS in this group of patients. Any significant decrease of IAP was not registered in the second group of patients with advanced peritonitis.

Table 1

Indicators of IAP, depending on the cause of peritonitis and the nature of pleural effusion in the abdominal cavity

The cause ofperitonitis	Nature of the effusion				Average IAP, mmHg
	Serous (n = 13)	Fibrinous (n = 40)	Purulent (n = 35)	Fecal (n = 9)	
Perforation of ulcer (n = 32)	-	8,7 ± 1,1	17,4 ± 1,8	-	11,7 ± 1,6
OKH(n = 27)	23,7 ± 2,3	25,2 ± 2,4	28,4 ± 2,5	33,0	25,6 ± 2,4
Strangulated hernia (n = 15)	8,8 ± 1,4	11,4 ± 1.0	17,6 ± 2,5	-	14,7 ± 2,8
Perforation of the colon (n = 9)	11,0	14,0	23,7 ± 2,3	25,5 ± 2,2	22,2 ± 3,9
Injury to abdominal organs (n = 6)	-	12,0	19,5 ± 1,6	22,7 ± 2,4	19,9 ± 2,8
Perforation of small intestine (n = 5)	9,0	11,0	17,3 ± 1,3	-	14,4 ± 2,5
Acute appendicitis (n = 3)	-	-	13,3 ± 1,2	-	13,3 ± 1,2
Average IAP, mmHg	13,1 ± 1,7	13,7 ± 1,7	19,6 ± 1,9	27,0 ± 1,8	17,4 ± 1,6

Table 2

The dependence of the severity of the condition on the level of intra-abdominal hypertension and the cause of peritonitis

The cause ofperitonitis	The indicators				
	APACHE II (points)	SAPS II (points)	SOFA (points)	MPI (points)	IAP (mmHg)
Perforation of ulcer	7,7 ± 1,8	20,4 ± 2,1	2,4 ± 0,6	16,7 ± 2,2	11,7 ± 1,6
Acute intestinal obstruction	14,2 ± 1,3	40,7 ± 3,5	3,7 ± 0,8	22,6 ± 1,5	25,6 ± 2,4
Strangulated hernia	10,3 ± 1,1	18,8 ± 1,6	3,0 ± 0,7	19,4 ± 1,6	14,7 ± 2,8
Perforation of the colon	13,8 ± 1,2	32,4 ± 2,9	3,4 ± 0,7	24,7 ± 1,8	22,2 ± 3,9
Injury to abdominal organs	-	21,7 ± 2,3	2,1 ± 0,5	20,1 ± 2,2	19,9 ± 2,8
Perforation of small intestine	8,8 ± 0,9	22,5 ± 2,4	2,5 ± 0,6	16,5 ± 1,4	14,4 ± 2,5
Acute appendicitis	8,4 ± 0,9	20,6 ± 2,2	2,6 ± 0,6	16,7 ± 2,0	13,3 ± 1,2
The average estimate	10,5 ± 1,3	25,3 ± 2,3	2,8 ± 0,7	19,5 ± 1,2	17,4 ± 1,6

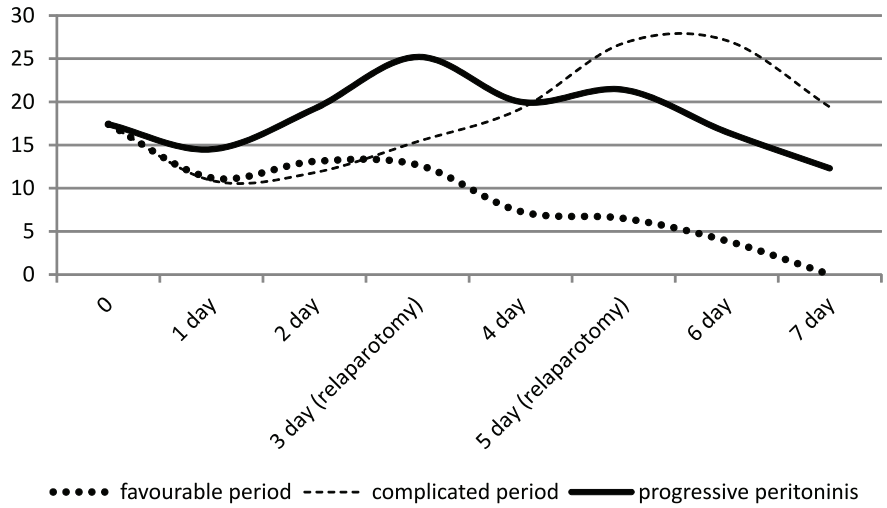
The increase of the abdominal pressure was being registered from the second day of the postoperative period. Meanwhile, the clinical symptoms of purulent-septic process and the progress of endogenous intoxication were affected 3 days after surgery. Repeated sanitation, made within 48-72 hours after the first operation, in 75% of the cases resulted in relief of peritonitis and further favorable course of the postoperative period. Mortality in patients with advanced peritonitis reached 25%.

Complications in the form of failure of the intestinal suture were recorded in 14 patients in 4-5 days after surgery (on average). The dynamics of IAP reflected the favorable postoperative course during the first 3 days. However, from the third day the increase of IAP accompanied by vague clinical symptoms was registered in all the patients. Indicators of IAP reached the critical value (> 35 mm Hg) by the time of diagnosing complications and taking the decision on the implementation of relaparotomy «on demand». The development of ACS with severe MOFS was observed in 4 patients in this group. Mortality reached 28,6%.

Conclusion

The abdominal hypertension is present in most patients. Its severity depends on the na-

ture of primary pathology, the prevalence and severity of peritonitis and other factors. There is the obvious dependence between the severity of abdominal hypertension, the data of integral scales for assessing the severity of the patient and the signs of multiple organ dysfunctions. The increase of IAP is a leading indicator with respect to clinical symptoms and laboratory indicators of the level of endogenous intoxication. ACS occurs in patients with advanced peritonitis on the background of paresis of the intestine and enteric insufficiency. The dynamics of IAP is one of the significant evaluation criteria of the postoperative period.



The dynamics of IAP in patients with secondary peritonitis in the postoperative period

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