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THE ROLE OF ACUTE PHASE PROTEINS IN ASSESSING THE SEVERITY OF THE CONDITION IN PATIENTS WITH PERFORATED GASTRODUODENAL ULCERS

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ABSTRACT — Perforated gastroduodenal ulcers are a serious disease of adults and children requiring emergency surgical care. In this article we consider the role of acute phase proteins in assessing the severity of the condition in patients (adults and children) with perforated gastroduodenal ulcers.

KEYWORDS — gastroduodenal ulcers, children, adults, acute phase proteins, perforated ulcer, C-reactive protein, alpha 2-macroglobulin, pregnancy-associated alpha2-glycoprotein.

INTRODUCTION

In clinical medicine there are problems that remain relevant, despite the achievements of med-ical science and practice.

The urgency of the problem of treatment of perforated gastroduodenal ulcers is due to the high incidence of peptic ulcer disease, frequent complications by perforation of ulcers and a variety of therapeutic and tactical settings [4, 6, 7]. Despite the achievements of pharmacotherapy of peptic ulcer disease, there is little reason to hope for a significant reduction in the number of patients with perforation of ulcers. This is explained, first of all, by the fact that in a significant number of patients with peptic ulcer perforation of the ulcer occurs against the background of asymptomatic course of the disease or when the clinical picture is erased. Among young people and adolescents, this number reaches 50% [4, 5, 7]. Such patients, of course, do not receive preventive treatment. In addition, in some patients with gastroduodenal ulcers, conservative treatment is in-effective and when the courses of drug therapy are interrupted, they develop complications of peptic ulcer disease, including perforation of the ulcer [3, 4]. In some patients, prophylactic treatment courses is difficult due to social reasons. Thus, it can be assumed that surgical treat-ment of perforated ulcers in the near future will occupy a significant place in emergency surgery of the abdominal cavity [1, 3, 5, 7]. It is known that the occurrence of any acute inflammatory process is accompanied by an acute-phase response of the body. Acute phase response is a com-plex of local and systemic reactions mediated by various mediators-cytokines, prostaglandins, kinins, hormones. The amplitude and nature of the response depend on the activity of the process [2, 3, 4, 5, 7]. It is proved that the acute phase response is accompanied by an increase in the content of certain groups of blood proteins (acute phase proteins — APPs), the concentration of which changes in response to inflammation, trauma and other pathological effects [2, 4, 7].

Aim

Determination of diagnostic significance of minor proteins (C-reactive protein — CRP, alpha2-macroglobulin α2M, pregnancy-associated alpha2-glycoprotein α2-PAG) in perforated gastro-duodenal ulcers.

MATERIALS AND METHODS

79 patients (adults and children) with perforated gastroduodenal ulcers were delivered to the surgical Department of *N.N. Silitscheva Regional Pediatric Clinical Hospital* and *S.M. Kirov Municipal clinical hospital № 3* in Astrakhan. Among them, 16 of the patients (20,4%) were admitted up to 24 hours from the onset of the disease, whereas 63 (79,6%) of patients were ad-mitted later than 24 hours. Late admission to the hospital in most cases was explained by the de-lay in patients seeking medical care. More often they were elderly people with atypical clinical picture of ulcer perforation, as well as young people and adolescents with a tendency to subside pain due to covered perforation. 83% of patients with gastroduodenal perforations were 16 to 60 years old. The ratio of males to females is 1:10. Perforations of acute ulcers without a history were noted in 19% of cases. 79 patients with perforated gastroduodenal ulcers aged 16 to 74 years who were on treatment were examined.

The dynamics of the disease was evaluated on the basis of clinical symptoms and objective indicators

of endogenous intoxication. The complex of clinical studies included: General analysis of blood and urine biochemical analyses (residual nitrogen and urea of blood, aminotransferases, creatinine, alkaline phosphatase, amylase of blood and urine, water-electrolyte composition), determined by standard methods.

Concentrations of C-reactive protein (CRP), alpha2-macroglobulin (α2M), pregnancy-related alpha2-glycoprotein (α2-PAG) were studied in the blood serum of patients on admission, immediately on the day of surgery and again 3–5 days after surgery, before discharge, by immuno-diffusion analysis (mg/l). The average donor indicators were determined in 82 healthy individuals aged 16 to 70 years. The obtained results were processed with the help of statistical analysis package Statistica 6, SPSS V 10.0.5, programs "STATLAND", "EXCEL-97", "Basic Statistical" taking into account standard methods of variational statistics, including calculation of the Student's t-criterion to assess the reliability of differences. The data are presented as M±m, signifi-cant differences were discussed at t≤ 0,001.

RESULTS AND DISCUSSIONS

In the serum of patients with perforated gastroduodenal ulcers before treatment, an increase in the level of CRP up to 120 mg/l was noted in 73%, α2-PAG-up to 160.3 mg/l in 56,%, α2M — up to 1280 mg/l in 56,% of patients. At the end of treatment (including surgery), a decrease in the level of these three proteins is recorded. Table 1 clearly shows the difference in the content of α2-PAG, CRP, α2M in serum before treatment and after.

Thus, minor proteins can serve as biomarkers of the intensity of the inflammatory process in a number of pathological conditions. Their determination in patients in critical condition is not only of clinical and diagnostic importance, but also allows to assess the severity of the condition of patients, the adequacy and effectiveness of therapy, as well as timely predict the likelihood of complications.

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Table 1. *Detection and concentration frequency (M±m) CRP, α2-PAG, α2M, in blood serum of donors and patients with perforated ulcer on receipt and discharge*

Reactant protein (identification method)	PU n=42		donors n=80
	before	after	
CRP (IDA)	73,41%	76,34%	3,33%
Serum, mg / l	120±14,5*	20,1±9,4*	0,7±0,4
α2-PAG , (IDA)	56,34%	48,04%*	7,77%
Serum, mg / l	160,3±10,5	40,0±6,67	3,5±1,09
α2M, (IDA)	100%	100%	100%
Serum, mg / l	1280±166	320±52	1033±267

Note: ** — reliability of differences between groups of patients with control (donors).*

Thus, the concentration of CRP is reduced by 6, α2-PAG by 4, α2M by 3 times. The concentration of the studied proteins in serum correlates with their concentration in exudate (Table 2).

Table 2. *Detection frequency and concentration of CRP, α2-PAG, α2M exudate of patients with perforated ulcer on receipt and discharge*

APPs(IDA)	n=42	
	before	after
CRP: frequency of detection. (%)	54,05%	45,94%
concentration, mg / l	160±26,6*	40±19,7*
α2-PAG: frequency of detection. (%)	44,5%	38,3%
concentration, mg / l	160±16,6*	60±19,7*
α2M: frequency of detection. (%)	100%	100%
concentration, mg / l	160±18*	40,2±12

Note: ** — P — reliability of differences before and after treatment.*