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LEVELS OF TNF- α AND IL-8 IN PATIENTS WITH ACUTE AND CHRONIC PANCREATITIS

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Annotation. The aim of the study was to research levels of TNF- α and IL-8 in patients with acute and chronic pancreatitis. The study included 86 patients with a confirmed diagnosis of acute edematous pancreatitis (group 1) and 36 patients with a confirmed diagnosis of chronic pancreatitis (group 2). Control group consisted of 70 conditionally healthy people, in whom laboratory and instrumental indices were determined similar to those in patients with acute and chronic pancreatitis. According to the aim and objectives of the study, we analyzed the levels of amylase, lipase, TNF- α and IL-8. The data was processed using the SPSS 20.0 statistical software package for Windows. Determined that the level of amylase in group 1 was significantly ($p < 0.01$) different from the same indicator in group 2 and in the control group. A similar trend was observed in the study of lipase levels in all groups. At the same time, there was no significant difference between the indicators of group 2 and the control group ($p > 0.05$). Regarding the levels of TNF- α , its highest rates were observed in group 1. In a statistical analysis, it turned out that the level of TNF- α was significantly higher ($p < 0.05$) in group 1 than in group 2 and the control group. The levels of IL-8 both in group 1 and group 2 were significantly higher ($p < 0.01$) than in the control group. At the same time, the value of this indicator also differed significantly in the statistical comparison of groups 1 and 2. Thus, in acute pancreatitis, the levels of TNF- α were significantly higher ($p < 0.05$) than in chronic pancreatitis, but its concentration did not correlate with other studied parameters. IL-8 levels progressively increase with an increase in the degree of activity of the inflammatory process, both in acute and in chronic pancreatitis, and correlates with an increase in such indicators as amylase and lipase in the acute form of the disease.

Key words: acute pancreatitis, chronic pancreatitis, TNF- α , IL-8.

Introduction

One of the most pressing problems of surgery for a long time remains the problem of pancreatitis. Despite the constant development of ideas about the pathogenesis of the inflammatory process in the pancreas, the development and introduction of new methods of diagnosis and treatment in the clinical practice, the problem of acute and chronic pancreatitis does not lose its relevance [1, 2].

The incidence of acute pancreatitis is increasing worldwide, and at present, this disease is one of the most common causes of hospitalization of patients with pathology of the gastrointestinal tract [3, 4].

Although the incidence and prevalence of chronic pancreatitis is lower than acute, it significantly affects the quality of life of patients characterized by chronic abdominal pain, frequent exacerbations of the disease, and also exocrine and/or endocrine insufficiency [5, 6].

The annual incidence of acute pancreatitis varies from 13 to 45 per 100000 people, and chronic - from 5 to 12 per 100000 people. The prevalence of chronic pancreatitis is about 50 per 100000 people [1].

In our opinion, it is of scientific interest to study the levels of inflammatory markers, such as TNF- α and IL-8, in patients with acute and chronic pancreatitis.

The aim of the research was to study the levels of TNF- α and IL-8 in patients with acute and chronic pancreatitis.

Materials and methods

The research was carried out in the clinic of the

Department of Endoscopic and Cardiovascular Surgery at National Pirogov Memorial Medical University, Vinnytsya. The total number of participants in the study was 192. Group 1 included 86 patients with a confirmed diagnosis of acute edema pancreatitis, group 2 - 36 patients with a confirmed diagnosis of chronic pancreatitis. The diagnosis was verified according to the classification of ICD-10 and according to national and local protocols.

The control group consisted of 70 conventionally healthy people, in whom laboratory and instrumental diagnostics were performed similarly to patients with acute and chronic pancreatitis.

In addition to the routine parameters, according to the purpose and objectives of the study, we studied serum TNF- α and IL-8 levels using an ELISA kit (BioSource).

According to the goals and objectives of the study, we analyzed the levels of such parameters as amylase, lipase, TNF- α and IL-8.

The data was processed using the SPSS 20.0 statistical software package for Windows.

Results. Discussion

The average age of patients with acute pancreatitis was 46.2 \pm 16.2 years, in patients with chronic pancreatitis - 45.8 \pm 17.9 years, in the control group - 39.7 \pm 10.5 years. The gender distribution in the groups was uniform, the number of men and women was almost the same.

Thus, the study groups were homogeneous in terms of

gender and age distribution.

The levels of the main laboratory indicators studied are given in Table 1.

As you can see in Table 1, the level of amylase in group 1 was 1664.1 ± 185.2 U/L and was significantly higher ($p < 0.01$) than the same indicator in group 2 (81.2 ± 40.2 U/L) and in the control group (75.2 ± 23.2 U/L). At the same time, there was no significant difference between the group 2 and the control group ($p > 0.05$).

A similar trend was observed in the study of lipase levels in all groups. Thus, the lipase level in group 1 was 1058.5 ± 120.7 U/L and was significantly higher ($p < 0.01$) for the same indicator in group 2 (37.6 ± 22.1 U/L) and in the control group (42.7 ± 13.8 U/L). At the same time, there was no significant difference between the group 2 and the control group ($p > 0.05$).

Regarding levels of TNF- α , the highest rates were observed in the group 1 - 65.2 ± 7.8 pg/ml. In group 2, the level of this indicator was 52.5 ± 6.2 pg/ml, and in the control group - 48.9 ± 5.6 pg/ml. In the statistical analysis, it was found that TNF- α levels were significantly higher ($p < 0.05$) in group 1 than in group 2 and in the control group. Although there was a slight increase in the numerical values of TNF- α in group 2, however, there was no significant difference between this indicator in group 2 and the control group ($p > 0.05$).

In the study of IL-8 levels, the following data were obtained.

IL-8 levels in both group 1 (224.1 ± 10.3 pg/ml) and group 2 (161.5 ± 7.1 pg/ml) were significantly higher ($p < 0.01$) for a similar indicator in the control group (19.1 ± 1.1 pg/ml). At the same time, the value of this indicator also significantly differed from the statistical comparison of groups 1 and 2.

TNF- α is a cytokine that causes undesirable effects in many autoimmune and inflammatory diseases. It is the key regulator of other proinflammatory cytokines and adhesion molecules of leukocytes and is the primary activator of immune cells.

IL-8 is one of the major proinflammatory cytokines produced by macrophages, epithelial and endothelial cells. It also plays an important role in the system of congenital immunity.

In recent years, several studies have hypothesized that TNF- α and IL-8 play a key role in the pathogenesis of acute pancreatitis. Researchers believed that cytokine levels in acute pancreatitis predicted the severity of the disease and the development of complications such as multiple organ

Tabl. 1. Levels of the studied laboratory indicators.

Indicator	Group 1 Acute pancreatitis (n=36)	Group 2 Chronic pancreatitis (n=86)	Control group (n=70)
Amylase (U/L)	$1664,1 \pm 185,2$	$81,2 \pm 40,2$	$75,2 \pm 23,2$
Lipase (U/L)	$1058,5 \pm 120,7$	$37,6 \pm 22,1$	$42,7 \pm 13,8$
TNF- α (pg/ml)	$65,2 \pm 7,8$	$52,5 \pm 6,2$	$48,9 \pm 5,6$
IL-8 (pg/ml)	$224,1 \pm 10,3$	$161,5 \pm 7,1$	$19,1 \pm 1,1$

failure and septic shock. It was concluded that in acute severe pancreatitis pro- and anti-inflammatory cytokine response occurs at an early stage and remains in the systemic circulation for several days. There was also a correlation with the dynamics of the severity of the disease. But it was concluded that the concentration of cytokines in the plasma can not accurately predict the death in some patients.

In our study, we aimed to determine the levels of TNF- α and IL-8 in acute and chronic pancreatitis and to assess the relationship between levels of these parameters and the concentration of pancreatic enzymes in both forms of the disease.

Our results have shown that levels of TNF- α were significantly higher in acute pancreatitis than in chronic pancreatitis. However, there was no significant increase in TNF- α production in chronic disease compared to healthy individuals. In determining correlations between pancreatic enzyme levels such as amylase and lipase levels, and TNF- α , we did not find any significant dependencies.

Instead, in the study of IL-8 levels, it turned out that this inflammation marker progressively increases with increasing activity of the inflammatory process, both in acute and chronic pancreatitis, and correlates with the growth of such parameters as amylase and lipase in acute form of the disease.

Conclusions and perspectives of further developments

1. In acute pancreatitis, TNF- α levels were significantly higher ($p < 0.05$) than in chronic pancreatitis, but its concentration did not correlate with other studied indicators.

2. IL-8 levels progressively increase with increasing activity of the inflammatory process, both in acute and chronic pancreatitis, and correlates with increased rates of amylase and lipase in acute form of the disease.

Prospective is the further study of the levels of other proinflammatory cytokines in acute and chronic pancreatitis.

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РІВНІ TNF- α ТА IL-8 У ХВОРИХ НА ГОСТРИЙ ТА ХРОНІЧНИЙ ПАНКРЕАТИТ

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Анотація. Мета дослідження - вивчити рівні TNF- α та IL-8 у хворих на гострий та хронічний панкреатит. У дослідження було включено 86 хворих із підтвердженим діагнозом гострого набрякового панкреатиту (група 1) та 36 хворих із підтвердженим діагнозом хронічного панкреатиту (група 2). Контрольну групу склали 70 умовно здорових людей, у яких визначалися лабораторні та інструментальні показники, аналогічні до таких у пацієнтів із гострим та хронічним панкреатитом. Відповідно до мети та завдань дослідження нами було проаналізовано рівні амілази, ліпази, TNF- α та IL-8. Дані обробляли із використанням статистичного пакету програм SPSS 20.0 для Windows. Встановлено, що рівень амілази у групі 1 достовірно ($p < 0,01$) відрізнявся від аналогічного показника у групі 2 та у контрольній групі. Аналогічна тенденція прослідковувалася і при дослідженні рівнів ліпази у всіх групах. При цьому достовірної різниці між обома показниками групи 2 та контрольної групи виявлено не було ($p > 0,05$). Щодо рівнів TNF- α , то найвищий його показник спостерігалися у групі 1. При статистичному аналізі виявилось, що рівень TNF- α був достовірно вищий ($p < 0,05$) у групі 1, ніж у групі 2 та контрольній групі. Рівні IL-8 як у групі 1, так і у групі 2 були достовірно вищими ($p < 0,01$) за аналогічний показник у контрольній групі. При цьому значення даного показника також достовірно відрізнялися і при статистичному порівнянні груп 1 та 2. При гострому панкреатиті рівні TNF- α були достовірно вищими ($p < 0,05$), ніж при хронічному панкреатиті, але його концентрація не корелювала із іншими досліджуваними показниками. Рівні IL-8 прогресивно зростають зі зростанням ступеня активності запального процесу, як при гострому, так і при хронічному панкреатиті, та корелює зі зростанням таких показників, як амілаза та ліпаза при гострій формі захворювання.

Ключові слова: гострий панкреатит, хронічний панкреатит, TNF- α , IL-8.

УРОВНИ TNF- α И IL-8 У БОЛЬНЫХ ОСТРЫМ И ХРОНИЧЕСКИМ ПАНКРЕАТИТОМ

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Аннотация. Цель исследования - изучить уровни TNF- α и IL-8 у больных острым и хроническим панкреатитом. В исследование было включено 86 больных с подтвержденным диагнозом острого отёчного панкреатита (группа 1) и 36 больных с подтвержденным диагнозом хронического панкреатита (группа 2). Отдельную контрольную группу составили 70 условно здоровых людей, у которых определялись лабораторные и инструментальные показатели аналогичны таковым у пациентов с острым и хроническим панкреатитом. Согласно цели и задач исследования нами были проанализированы уровни амилазы, липазы, TNF- α и IL-8. Данные обрабатывали с использованием статистического пакета программ SPSS 20.0 для Windows. Установлено, что уровень амилазы в группе 1 достоверно ($p < 0,01$) отличался от аналогичных показателей в группе 2 и в контрольной группе. Аналогичная тенденция прослеживалась и при исследовании уровней липазы во всех группах. При этом достоверной разницы между обеими показателями группы 2 и контрольной группы выявлено не было ($p > 0,05$). Относительно уровней TNF- α , то самые высокие его показатели наблюдались в группе 1. При статистическом анализе оказалось, что уровень TNF- α был достоверно выше ($p < 0,05$) в группе 1, чем в группе 2 и контрольной группе. Уровни IL-8 как в группе 1, так и в группе 2 были достоверно выше ($p < 0,01$) аналогичного показателя в контрольной группе. При этом значение данного показателя также достоверно отличались и при статистическом сравнении групп 1 и 2. Таким образом, при остром панкреатите уровни TNF- α были достоверно выше ($p < 0,05$), чем при хроническом панкреатите, но его концентрация не коррелировала с другими исследуемыми показателями. Уровни IL-8 прогрессивно растут с ростом степени активности воспалительного процесса, как при остром, так и при хроническом панкреатите, и коррелирует с ростом таких показателей, как амилаза и липаза при острой форме заболевания.

Ключевые слова: острый панкреатит, хронический панкреатит, TNF- α , IL-8.