

ISSN 2509-4327 (print)
ISSN 2510-4780 (online)

Inter
GING



Deutscher Wissenschaftsherold German Science Herald

№ 2/2020

Die Zeitschrift „Deutscher Wissenschaftsherold“ ist eine Veröffentlichung mit dem Ziel ein breites Spektrum der Wissenschaft allgemeinverständlich darzustellen. Die Redaktionsleitung versteht sich als Vermittler zwischen Wissenschaftlern und Lesern. Durch die populärwissenschaftliche Bearbeitung wird es möglich unseren Lesern neue wissenschaftliche Leistungen am besten und vollständigsten zu vermitteln. Es werden Untersuchungen, Analysen, Vorlesungen, kurze Berichte und aktuelle Fragen der modernen Wissenschaft veröffentlicht.

Impressum

Deutscher Wissenschaftsherold – German Science Herald

Wissenschaftliche Zeitschrift

Herausgeber:

InterGING

Wiesenwinkel 2,
31785 Aerzen

Inhaber: Marina Kisiliuk

Tel.: + 49 5154 567 2017

Fax.: +49 5154 567 2018

Email: info@dwherold.de

Internet: www.dwherold.de

Chefredakteur:

Prof. Zamiatin P.M.

Korrektur:

O. Champela

Gestaltung:

N. Gavrilets

Auflage: № 2/2020 (September) – 20

Redaktionsschluss September, 2020

Erscheint vierteljährlich

Editorial office: InterGING

Wiesenwinkel 2,

31785 Aerzen

Tel.: + 49 5154 567 2017

Fax.: +49 5154 567 2018

Email: info@dwherold.de

Deutscher Wissenschaftsherold – German Science Herald is an international, German/English language, peer-reviewed journal and is published quarterly.

№ 2/2020

Druck: WIRMachenDRUCK GmbH

Mühlbachstr. 7

71522 Backnang

Deutschland

Der Abdruck, auch auszugsweise, ist nur mit ausdrücklicher Genehmigung der InterGING gestattet. Die Meinung der Redaktion oder des Herausgebers kann mit der Meinung der Autoren nicht übereinstimmen. Verantwortung für die Inhalte übernehmen die Autoren des jeweiligen Artikels.

INDEXING: Index Copernicus, Google Scholar, Ulrich's Periodicals Directory, Fachzeitschriften, MIAR.



UNIVERSITAT DE BARCELONA **MIAR**
<http://miar.ub.edu/issn/2509-4327>

© InterGING

© Deutscher Wissenschaftsherold – German Science Herald

Naboychenko Ya.V.

Kharkiv National Medical University, Ukraine

Zamiatin P.M.

DU "Institute of General and Emergency Surgery named after V.T. Zaitsev to NAMS of Ukraine"

PECULIARITIES OF DEVELOPMENT OF FREE-RADICAL PROCESSES IN PATIENTS WITH PSEUDOCYST OF THE PANCREAS DEPENDING ON THE DEGREE OF THEIR FORMATION

Abstract. *The aim. Improving the results of surgical treatment of patients with pseudocysts of the pancreas by conducting a comparative analysis of the development of free radical processes in the body depending on the degree of formation of pseudocysts of the pancreas. Materials and methods. The analysis of examination and treatment of 101 patients was performed. All patients with SCI were divided into 2 clinical groups - the main and the comparison group. The main group includes 39 (48.43%) patients who were treated in the surgical department of the city clinical hospital №17 from 2015 to 2020. The comparison group included 62 (51.57%) patients who in the period 2009-2014, traditional medical and diagnostic tactics were used. Results and discussion. A comparative analysis of the peculiarities of the development of free radical processes of the organism depending on the degree of formation of the pseudocyst of the pancreas. Conclusions. The value of glutathione reductase and malonic dialdehyde (MDA) at different degrees of cyst wall formation was established. It has been observed that the toxic effect of free radical oxidation products helps to maintain the inflammatory reaction and tissue ischemia in patients with unformed pseudocysts of the pancreas.*

Key words: *pancreatic pseudocysts, glutathione, malonic dialdehyde, free radical oxidation.*

Pseudocysts of the pancreas are the most common variant of local complications of acute pancreatitis, accounting for 50-92% in destructive forms [1, 2]. In 81% of cases, pseudocysts have a complicated course [3]. This is due to insufficiently developed diagnosis and lack of criteria for choosing tactics of treatment of these patients. The question of treatment of patients with pseudocysts of the pancreas is considered complex and unresolved [4]. Traditionally, patients with pseudocysts of the pancreas use waiting tactics [5], but it is during this time there are life-threatening complications [6] in the form of suppuration of the cyst, bleeding, violation of the integrity of the cyst wall, compression of hollow organs, gastric obstruction tract and portal hypertension [7].

The aim of the work is to study the peculiarities of the development of free radical processes of the organism depending on the degree of formation of the pseudocyst of the pancreas.

Materials and methods of research. The analysis of examination and treatment of 101 patients was performed. All patients with SCI were

divided into 2 clinical groups - the main and the comparison group. The main group includes 39 (48.43%) patients who were treated in the surgical department of the city clinical hospital №17 from 2015 to 2020. The comparison group included 62 (51.57%) patients who in the period 2009-2014, traditional medical and diagnostic tactics were used. To conduct a comparative analysis and obtain more reliable results of the study, a control group consisting of 25 conditionally healthy examined volunteers, residents of the Kharkiv region, was additionally introduced. Groups of patients were representative by sex, age, baseline clinical and laboratory parameters. The localization and average size of the pseudocyst are presented in table. 1.

The set of diagnostic measures included fibroesophagogastroduodenoscopy (FEGDS), ultrasound (US), computed tomography (CT), endoscopic retrograde cholangiopancreatography (ERCP), as well as biochemical examination of cysts. Diagnosis of the disease was performed on the clinical symptom complex, according to instrumental and laboratory tests. Studies in

Table 1

Localization and average size of pseudocysts of the pancreas (M ± σ)

Indicator	Localization of pseudocysts in the pancreas			
	Head	Body I	Body-Tail I	Tail
Number of patients	30	4	10	32
The average size of the pseudocyst, mm	44,8±5,6	45,2±9,8	55,4±9,8	66,1±9,4

patients were performed with informed consent in accordance with the ethical standards regulated by the Declaration of Helsinki in 2000. The content (MDA) in mmol / l was evaluated by color reaction with 2-thiobarbituric acid in the presence of trichloroacetic acid by the method of ID Steel (1977). The glutathione content was determined in mmol / l by the method of S. Sedlak, R. Lindsey (1968). The activity of glutathione reductase was evaluated (in mmol / h • l) by its ability to oxidize NADPH at a wavelength of 340 nm E. Racker (1955). The activity of glucose-6-phosphate dehydrogenase (in μmol / h • l) was evaluated according to the method of Yu.Ya. Zechariah. The uric acid content (in μmol / l) was determined by the method of G. Oteta et al. (1976).

The results of the study and their discussion.

In order to identify the clinical features of pseudocysts of the pancreas of varying degrees of formation and their complications, we conducted a comparative assessment of the symptoms

observed in patients seeking medical attention (Tab. 2).

The presence of any of these symptoms, taking into account the anamnestic data on the episode of acute pancreatitis was an indication for diagnostic measures to clarify the diagnosis. All patients with pseudocysts of the pancreas underwent esophagogastroduodenoscopy (EGDS). Extrahepatic portal hypertension syndrome, which was detected in 10 (15.4%) patients, was manifested by varicose veins of the stomach and esophagus, and in 4 cases - ascites. The reason for this was the compression of the veins of the portal system by a cyst, as well as thrombosis of the splenic artery in unformed pseudocysts (SA Starostin, 1999). In 4 (6.15%) patients during ERCP biliary hypertension was detected, of which two (3.08%) patients had mechanical jaundice. Compression deformation of the lumen of the stomach and duodenum of varying severity was observed in 47 (50.8%) patients with pseudocysts of the pancreas.

Table 2

Frequency of clinical symptoms in pseudocysts of the pancreas

The studied sign	Unformed pseudocysts (n=45)	Formed pseudocysts (n=39)	Purulent pseudocysts (n=6)	χ ²	p
Pain	39 (96,67%)	36 (89,67%)	6 (100%)	1,689	0,430
Nausea	14 (46,67%)	13 (44,83%)	3 (50%)	0,059	0,971
Vomit	7 (23,33%)	3 (10,35%)	1 (16,67%)	1,770	0,413
Jaundice	3 (10%)	0	1 (16,67%)	0,56	0,613
Subfebrile	11 (36,67%)	4 (13,79%)	5 (83,33%)	12,196	0,002

Table 3

Endoscopic picture of the mucous membrane of the stomach and duodenum in postnecrotic pseudocysts of the pancreas

The nature of the pathology	Unformed pseudocysts (n=45)	Formed pseudocysts (n=39)	χ ²	p
Erythema of the gastric mucosa	45 (100%)	36 (86,67%)	10,824	0,001
Swelling of the gastric mucosa	18 (51,43%)	7 (23,33%)	4,266	0,039
Cyanosis of the mucous membrane	11 (31,43%)	3 (10%)	3,213	0,073
Erosion of the stomach	6 (17,14%)	3 (10%)	0,222	0,638
Duodenitis	34 (97,14%)	20 (66,67%)	8,614	0,003
Papillitis	13 (37,14%)	3 (10%)	5,034	0,025

Irrespective of localization at the size of a pseudocyst of a pancreas more than 45 mm (19 patients) at all patients deformation of a gleam of a stomach due to its compression from outside, explosion of a back wall of a stomach, a hyperplasia of folds of a stomach, deformation of a bulb and narrowing of a descending branch of a duodenum was defined. Changes in the mucous membrane in the areas adjacent to the cyst, had differences depending on the formation of the pseudocyst, and are presented in table. 3.

The study convincingly demonstrated the importance of functional and morphological changes in the stomach and duodenum, which revealed endoscopic methods in the pseudocysts of the pancreas. It was found that the processes of free radical evaluation are more intense in unformed pseudocysts of the pancreas, as evidenced by an increase in MDA in blood plasma and erythrocytes than in groups of people with formed pseudocysts, also in control. It was found that the activity of glutathione reductase in the blood was lowest in people with unformed postnecrotic cysts of the pancreas. There was also significant use of the activity of G-6-FDG - the main cycle of the enzyme pentose phosphates, which catalyzes the formation of reduced equivalents in unformed pseudocysts of pancreatic debt due to the formed pseudocysts of the pancreas. There was an inverse correlation between the content of malonic dialdehyde and glutathione in erythrocytes (Spearman correlation coefficient $r = - 896$, $p < 0,01$). Thus, the intensification of lipid peroxidation processes in unformed pseudocysts of the pancreas occurs against the background of the formation of such components of the endogenous antioxidant system as glutathione and glutathione reductase.

Conclusions. The studied indicators can serve as markers in determining the optimal timing of the formation of the physical strength of the pseudocyst wall, sufficient for the imposition of a cystodegestive anastomosis. Blood glutathione

reductase activity was lowest ($r = 0.883$; $p < 0.05$) in patients with unformed postnecrotic pancreatic cysts, regardless of the thickness of the cyst wall, because it indicates that the cyst wall is not strong enough.

In order to predict infection of the cystodegestive anastomosis area, it is possible to use the determination of G-6-FDG activity, glutathione reductase and glutathione indicators as markers of prognosis of early postoperative complications.

References

1. DiMaio CJ. Management of complications of acute pancreatitis. *Curr Opin Gastroenterol.* 2018 Sep;34(5):36-42.
2. Desyaterik VI, Krikun MS. Zmini klinichnih pidhodiv ta likuval'noi taktiki pri gostromu pankreatiti u svitli pereglyanutoi klasifikacii Atlanta 2012. *Klinichna hirurgiya.* 2017;3:51-5 [In Ukr.].
3. Larrey Ruiz L, Luján Sanchis M, Peño Muñoz L, Barber Hueso C, Cors Ferrando R, Durá Ayet AB, et al. Pseudoaneurysm associated with complicated pancreatic pseudocysts. *J. Rev Esp Enferm Dig.* 2016;108(9):583-5.
4. Santhi Swaroop Vege, David C. Whitcomb, Shilpa Grover. Management of acute pancreatitis. Literature review current through:2018. This topic last updated: Apr 12, 2018, 12-14.
5. Pidgirnij BYA. Perekhresni mekhanizmi zapalennya i gemostazu v likuvanni hvorih na gostrij pankreatit [disertaciya]. *Uzhgorod: Uzhgorods'kij nac. un-t;*2017.21 s. [In Ukr.].
6. Rajendran P., Nandakumar N., Rengarajan T., Palaniswami R., Gnanadhas E. N., Lakshminarasiah U. Antioxidants and human diseases. *Clinica Chimica Acta.* 2014;436:332–347. 32-34.
7. Deponte M. Glutathione catalysis and the reaction mechanism of glutathione-dependent enzymes. *Biochimica et Biophysica Acta.* 1830;2013:317–326.

CONTENT:

Pohorielova O.O., Shevchenko O.S. DEPENDENCE OF HUMAN-BETA-DEFENSIN-1 LEVEL ON DRUG-RESISTANCE SPECTRUM AND TREATMENT REGIMENS IN PATIENTS WITH PULMONARY TUBERCULOSIS	3
Fridman R. A COMPARISON OF DEEP NEURAL NETWORK ARCHITECTURES FOR ARRHYTHMIA CLASSIFICATION	8
Sahan V. TOWARDS THE ECG-BASED BIOMARKERS OF HUMAN AGING	16
Yuzko R.V., Slobodian O.M. PECULIARITIES OF PERINATAL TOPOGRAPHY OF THE HEPATODUODENAL LIGAMENT COMPONENTS	23
Malynovskyi A. MOBILE SYSTEM FOR ECG SIGNALS COLLECTION AND PROCESSING IN REAL-TIME	28
Burianov O.A., Prozenko V.V., Obada Muhammad Bishtawi, Solonizyn J.O., Solovyov I.O. ANALYSE VON ASEPTISCHEN PERIPROTHETISCHEN KOMPLIKATIONEN BEI KNIEGELENKSTUMOREN JE NACH ART DER KNIEGELENKSENDOPROTHESE	36
Naboychenko Ya.V., Zamiatin P.M. PECULIARITIES OF DEVELOPMENT OF FREE-RADICAL PROCESSES IN PATIENTS WITH PSEUDOCYST OF THE PANCREAS DEPENDING ON THE DEGREE OF THEIR FORMATION	45