



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2019; 8(7): 398-400

© 2019 TPI

www.thepharmajournal.com

Received: 01-05-2019

Accepted: 03-06-2019

## Droniak MM

Ivano-Frankivsk National Medical University, Department of Surgery 2 and Cardiosurgery (Head of the Department-Prof. Shevchuk IM) Ukraine, Ivano-Frankivsk, Galitska, Ukraine

## Application of extranil for lavage of abdominal cavity in patients with postoperative peritonitis

Droniak MM

### Abstract

Application of lavage of the abdominal cavity with extranil in patients with postoperative peritonitis promotes regression of the inflammatory process in the abdominal cavity and manifestations of endotoxemia and systemic inflammation. Depending on the curative tactics of the postoperative period, all patients were divided into two groups: - observation group (OG) - 26 patients with postoperative peritonitis where in the postoperative period was used lavage of the abdominal cavity with a solution for peritoneal dialysis extranil; - control group (CG) - 30 patients with postoperative peritonitis, in complex treatment of which extranil was not used.

The severity of condition in patients with PP was rated with the SAPS II scale. The presence and severity of manifestations of MOF in patients with PP was determined by the SOFA scale. The level of endogenous intoxication was evaluated by the amount in blood of serum middle-mass molecules, C-reactive protein, and leukocyte index of intoxication. During relaparotomy lavage of abdominal cavity was done twice with 2-3 liters of a 0, 02% solution of decamethoxin at a temperature of 30-35 ° C. After removal of the remains of the drug from the abdominal cavity, 2 liters of Extranil with a temperature of 37,0C, the active substance of which is icodextrin, but not glucose, so it is not a nutrient for microorganisms, but has an antimicrobial effect due to hyperosmolarity and influence on the peritoneum by increasing its adsorption properties. After that the abdominal cavity was drained from four points by polychlorinated biphenyl tubes, which were fixed to the skin and closed for 6 hours.

The use of the proposed method in patients with postoperative peritonitis can reduce the frequency of postoperative complications and reduce the mortality rate by 1,5 times. The total mortality rate among all patients with peritonitis was 13, 2% in the control group and 7, 6% in the observation group.

**Keywords:** Postoperative peritonitis, multiple organ failure, extranil.

### Introduction

In the structure of surgical morbidity, one of the first places takes postoperative peritonitis (PP). One of the most difficult problems of modern abdominal surgery remains the treatment of severe forms of PP and its complications. In recent years we observe increase of number of patients with severe course of PP, high percentage of postoperative complications because it occurs after already performed surgical interventions. Mortality at PP is from 19 to 30%, and with progression of multiple organ failure (MOF) reaches 80% and, unfortunately, does not have a tendency to decrease and leads to large economic and medical-social expenses <sup>[1, 2]</sup>. Abdominal sepsis with multiple organ failure is the main factor in fatal cases in patients with PP, condition of which directly depends on the severity of endotoxemia <sup>[3]</sup>. Treatment of endotoxemia has direct influence on the result of treatment of patients with PP <sup>[4, 5]</sup>. The inability to remove the infection's source in the abdominal cavity in one operation served as the basis for the development of the concept of stage surgical treatment of severe forms of PP. However, the therapeutic effect of a single lavage of the abdominal cavity is short, which dictates the need for repeated, traumatic for patients, relaparotomy. Modern methods of extracorporeal detoxification in patients with PP, when the patient has already damaged all systems of physiological detoxification and there is severe endotoxemia and MOF, can remove toxins from blood <sup>[6]</sup>. In this regard, there is an interest in the study of known and development of new methods of detoxification, which will help to prevent the exit of toxins into the bloodstream from the source of inflammation <sup>[7]</sup>.

### Material and methods

We performed analysis of the results of the examination and surgical treatment of 56 patients with postoperative peritonitis, who were treated at the Ivano-Frankivsk Regional Hospital due to various diseases and injuries of the abdominal cavity. Depending on the characteristics of

### Correspondence

Droniak MM

Ivano-Frankivsk National Medical University, Department of Surgery 2 and Cardiosurgery (Head of the Department-Prof. Shevchuk IM) Ukraine, Ivano-Frankivsk, Galitska, Ukraine

the used therapeutic tactics of the postoperative period, all patients were divided into two groups:

-Observation group (OG)-26 patients with postoperative peritonitis who in the postoperative period underwent the abdominal cavity lavage with a solution for peritoneal dialysis extranil;

-Control group (CG)-30 patients with postoperative peritonitis, in the complex treatment of which extranil was not used.

To assess the condition of patients at the beginning and in the process of treatment were used a complex of modern clinical and laboratory and instrumental research methods. To assess the severity of the condition of patients with PP was used the SAPS II scale. The presence and severity of manifestations of MOF in patients with PP initially and in dynamics were determined on the SOFA scale. For the intraoperative evaluation of the severity of PP was used the Mannheim Peritonitis Index (MPI). The level of endogenous intoxication was evaluated by amount of middle weight molecules (MWM) in blood serum. The concentration of MWM was determined by express method proposed by Gabrielyan MI. Their accumulation in the blood is accompanied by the progression of PP and MOF. The C-reactive protein (CRP) in blood serum was determined by using a set of reagents. Today CRP is one of the main markers of sepsis. The leukocyte index of intoxication (LII) by Calf-Calif is highly sensitive and easy to determine parameter of the systemic inflammatory response and the degree of toxemia, indicator of the effectiveness of the treatment of PP. LII in healthy people is  $1,0 \pm 0,5$ . An increase LII to 3, 5 and more was considered as a sign of severe endogenous intoxication. Statistical processing of data obtained was carried out using the methods of variation statistics on a personal computer using the application package of Statistica for Windows 6,1 (StatSoft, USA). To determine the type of distribution of the values of the studied characteristics was used W-criterion of Shapiro-Whilk. Non-parametric data are given in the form of the median (Me) and the interquartile scale (25th and 75th

quartiles): Me (25%, 75%). Mann-Whitney's U-criterion was used to compare unbound groups by quantitative features. In order to compare the related groups in quantitative terms was used the Wilcoxon criterion for pair comparisons. To compare the qualitative characteristics of the groups was used classic Pearson  $\chi^2$  criterion. The critical level of significance (p) in checking statistical hypotheses in this study was 0, 05. The assessment of the indicators was carried out initially (during admission to the hospital, before operation), and in the 1-st, 3-rd, 5-th, 10-th day after the operation. Patients of both groups were comparable by age, sex, characteristics of the main and concomitant pathology and severity of condition.

All necessary surgical intervention was performed to the patients in full size. In the postoperative period all patients received standard treatment, including rational antibiotic therapy. During relaparotomy, after mechanical purification of the abdominal cavity from the feces, bile, blood clots, fibrin layers, the lavage of abdominal cavity was done twice with 2-3 liters of a 0, 02% solution of decamethoxin temperature of 30-35 ° C. After removal of the remnants of the drug from the abdominal cavity, 2 liters of solution for the peritoneal dialysis Extranil with a temperature 37, 0 C, the active substance of which is iododextrin, but not glucose, so it is not a nutrient medium for microorganisms, but has an antimicrobial effect because of hyperosmolarity and has an influence on the peritoneum by increasing its adsorption properties. After that the abdominal cavity was drained from four points by polychlorinated biphenyl tubes, which were fixed to the skin and closed for 6 hours. The procedure was repeated 4 times a day.

**Results of treatment and their discussion**

The main factor of the adverse outcome in postoperative peritonitis is the MOF, so the greatest attention during the assessment of the patients' condition was given to indicators of endotoxycosis and systemic inflammation. In tabl. 1 is shown the dynamics of some indicators of endotoxycosis and systemic inflammation in patients with CG and OG.

**Table 1:** Dynamics of indicators of endotoxycosis and systemic inflammation in patients with CG and OG.

Indicator	Group	Time after operation (day)				
		Initially Me (25%; 75%)	1-st day Me (25%; 75%)	3-rd day Me (25%; 75%)	5-th day Me (25%; 75%)	10-th day Me (25%; 75%)
Sofa, point	CG	6 (5; 8)	7 (5; 8)	6 (4; 7)	4 (1; 5)	1 (0; 3)
	OG	7 5; 8	5 (3; 7)	3 (2; 5)	1 (2; 5)	0 (0; 1)
LII (1,0±0,5)	CG	3,9 (3,5; 4,9)	4,0 (3,2; 5,2)	4,7 (3,4; 6,3)	3,2 (2,3; 4,0)	2,3 (1,3; 2,9)
	OG	4,3 (3,4; 5,0)	4,2 (3,2; 5,0)	3,7 (3,0; 5,2)	1,9 (1,6; 2,9)	1,3 (1,0; 2,1)
CRP (<10 mg/l)	CG	64 (30; 117)	75 (49; 115)	65 (36; 111)	29 (9; 53)	13 (9; 22)
	OG	76 (27; 115)	84 (48; 128)	39 (26; 85)	9 (8; 21)	8 (6; 15)
MWM (0,215 – 0,282)	CG	0,483 (0,426; 0,559)	0,596 (0,512; 0,691)	0,613 (0,429; 0,686)	0,461 (0,377; 0,540)	0,295 (0,258; 0,334)
	OG	0,481 (0,424; 0,557)	0,587 (0,527; 0,628)	0,479 (0,416; 0,549)	0,322 (0,286; 0,390)	0,245 (0,224; 0,284)

In the analysis of the dynamics of the MOF it was found that initially indicators of the SOFA scale in CG were 6 (5; 8) points and in the OG-7 (5; 8) points (p=0,354). On the background of the progression of endotoxycosis and systemic inflammation on 1-st day, the indicators of the SOFA scale in the CG remained high compared with the basic level and amounted to 7 (5; 8) points (p = 0,972). From the 3-rd day in CG indicators of the SOFA scale fell to 7 (5; 8) points (p <0,001). During the 5th and 10th days in patients from CG have steady decline in the SOFA scale to 4 (1; 5) and 1 (0; 3) points (p <0,001) respectively. In patients with OG, who used extranil, on the 1-st, 3-rd, 5-th, 10-th days of the postoperative

period there was a decrease in the indicators of the SOFA scale to 5 (3; 7), 3 (2; 5), 1 (0; 4), 0 (0; 1) points (p <0,001) respectively. It was found that in patients with OG, starting from the 1-st day of the postoperative period, was noted faster decrease of the indicators of the SOFA scale than in CG: on the 1-st day - p<0,001, on the 3-rd day-p<0,001, on the 5-th day - p<0,001, on the 10-th day - p = 0,005.

Initially, the LII in the blood serum of patients with PP was much higher than normal range (1,0 ± 0,5) and was equal to CG 3,9 (3,5, 4,9 and to OG – 4,3 (3,4; 5,0) (p = 0,110). On the 1-st and 3-rd days in the CG was noted further growth of LII to 4,0 (3,2, 5,2) and 4,7 (3,4; 6,3) respectively (p <0,001). At

the 5th and 10th days in patients from CG there was a decrease of LII to 3,2 (2,3; 4,0) and 2,3 (1,3; 2,9) respectively ( $p < 0,001$ ). In patients from OG on the 1-st day also was noted the growth of LII in comparison with the initial level, which equaled 4,2 (3,2; 5,0) ( $p < 0,001$ ). Starting from the 3-rd day in the OG LII decrease to 3, 7 (3,0; 5,2) ( $p < 0,001$ ). At the 5-th and 10-th days in patients with OG there was a steady decline of LII to normal indicators – 1,9 (1,6; 2,9) and 1,3 (1,0; 2,1) respectively ( $p < 0,001$ ) It was found that in patients from OG was a faster decrease in LII than in KG, starting from the 3rd day of the postoperative period: on 3-rd day -  $p < 0,001$ , on the 5-th day -  $p < 0,001$ , on the 10-th day -  $p < 0,001$ .

Initially, the concentration of CRP in blood serum of patients with PP was much higher than normal values (up to 10 mg/l) and was in CG 64 (30; 117) mg/l; in OG - 76 (27; 115) mg/l ( $p = 0,643$ ). At the first day in the CG was noted further increase of CRP concentration to 75 (49; 115) mg/l ( $p < 0,001$ ). Starting from the 3rd day in CG the CRP concentration decreased to 65 (36; 111) mg/l ( $p = 0,571$ ). On the 5-th and 10-th days in patients with CG there was steady decline of CRP to 29 (9; 53) and 13 (9; 22) mg/l respectively ( $p < 0,001$ ). In patients from OG on 1-st day was noted an increase in CRP concentration to 84 (48; 128) mg/l ( $p < 0,001$ ). Starting from the 3-rd day in the OG the concentration of CRP decreased to 39 (26; 85) mg/l ( $p < 0,001$ ). On the 5-th and 10-th days in patients from OG there was steady decrease of CRP to normal values - up to 9 (8; 21) and 8 (6; 15) mg/l respectively ( $p < 0,001$ ). It was found that in patients with OG, starting from the 3-rd day of the postoperative period, was noted faster decrease of the concentration of CRB, than in CG: on 3-rd day -  $p < 0,001$ , on the 5-th day -  $p < 0,001$ , on the 10-th day -  $p < 0,001$ .

Initially, the concentration of MWM in the blood serum of patients with PP was much higher than normal values (0,215-0,282) and amounted to 0,483 (0,426; 0,559) in the CG and in the OG – 0, 49 (0,416; 0,549) ( $p = 0,477$ ). On the 1-st and 3-rd days in the CG was noted further increase in the concentration of MSM to 0,596 (0,512; 0,691) and 0,613 (0,429; 0,686) respectively ( $p < 0,001$ ). On the 5-th day in patients with CG there was a decrease in the concentration of MWM to 0,461 (0,377; 0,540) ( $p = 0,228$ ). And only on the 10-th day there was a decrease in the concentration of MWM to almost normal values – 0,295 (0,258; 0,334) ( $p < 0,001$ ). In patients from OG on the 1-st day was noted an increase in the concentration of MWM to 0,587 (0,527; 0,628) ( $p < 0,001$ ). Starting from the 3-rd day the concentration of MSM in the OG decreased to 0,479 (0,416; 0,549) ( $p < 0,001$ ). On the 5-th and 10-th days in patients with OG there was a steady decrease in the MWM to normal values – 0, 32 (0,286; 0,390) and 0,245 (0,224; 0,284) respectively ( $p < 0,001$ ). It was found that in patients from OG was observed more rapid decrease in the concentration of MSM, than in CG from the 3rd day of the postoperative period: on the 3-rd day -  $p < 0,001$ , on the 5-th day -  $p < 0,001$ , on the 10-th day -  $p < 0,001$ . So, the results of the analysis of intoxication markers SOFA, LII, SRP, MWM suggest that in the majority of patients from both groups the disease were accompanied by severe forms of sepsis with signs of MOF initially and after surgical treatment. In addition, despite the complex treatment, signs of systemic inflammation and MOF in the majority of patients from CG progressed or persisted on the first 5 days after surgery. In patients from OG in the complex treatment for the rehabilitation of the abdominal cavity was used extranal, was

noted regression of systemic inflammation and MOF from the 3rd day of the postoperative period. Despite adequate surgical treatment and intensive complex treatment, some patients had lethal end because of progressive manifestations of endogenous intoxication and MOF. Total mortality among all patients with peritonitis was in CG 12, 2% and in the OG-7, 6%. So, the mortality in the OG was 1, 5 times lower than in the CG.

## Conclusion

Application of the solution for peritoneal dialysis Extranil for the rehabilitation of the abdominal cavity in patients with postoperative peritonitis contributes to accelerating the regression of the inflammatory process in the abdominal cavity and manifestations of endotoxemia and systemic inflammation, make frequency of cases of postoperative complications and mortality 1,5 times lower, from 13,2% to 7,6%.

## References

1. Reinhart K, Daniels R, Kissoon N, Machado FR, Schachter RD, Finfer S *et al.* Recognizing Sepsis as a Global Health Priority-A WHO Resolution. *The New England Journal of Medicine.* 2017; 377:414-417.
2. Vincent JL, Moreno R, Takala J, Willatts S, de Mendonca A, Bruining H *et al.* The SOFA (Sepsisrelated Organ Failure Assessment) score to describe organ dysfunction/failure. *Intensive Care Medicine.* 1996; 22:707-710.
3. Rivers EP, Jaehne AK, Nguyen HB, Papamtheakis DG, Singer D, Yang JJ *et al.* Early biomarker activity in severe sepsis and septic shock and a contemporary review of immunotherapy trials: not a time to give up, but to give it earlier. *Shock.* 2013; 39:127-137.
4. Kiewiet JJS, van Ruler O, Boermeester MA, Reitsma JB. A decision rule to aid selection of patients with abdominal sepsis requiring a relaparotomy. *BMC Surgery.* 2013; 13:28.
5. van Ruler O, Mahler CW, Boer KR, Reuland EA, Gooszen HG, Opmeer BC *et al.* Comparison of on-demand vs planned relaparotomy strategy in patients with severe peritonitis: a randomized trial. *Journal of the American Medical Association.* 2007; 298:865-872.
6. Koperna T, Schulz F. Relaparotomy in peritonitis: prognosis and treatment of patients with persisting intraabdominal infection. *World Journal of Surgery.* 2000; 24:32-37.
7. Kirkpatrick AW, Coccolini F, Ansaloni L, Roberts DJ, Tolonen M, McKee JL *et al.* Closed or open after source control laparotomy for severe complicated intraabdominal sepsis (the COOL trial): study protocol for a randomized controlled trial. *World Journal of Emergency Surgery.* 2018; 13:26.