The Pharma Innovation

ISSN: 2277- 7695
CODEN Code: PIHNBQ
ZDB-Number: 2663038-2
IC Journal No: 7725

Received: 14-02-2014
Accepted: 07-05-2014

Vol. 3 No. 4. 2014
Online Available at www.thepharmajournal.com

THE PHARMA INNOVATION - JOURNAL

The Functional Status of Liver as Factor of Early Polyorganic Insufficiency in Patients With Acute Small Intestine Obstruction

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Complex examination and surgical treatment of patients with the acute intestinal obstruction was conducted. It was established that both during the preoperative period and after the surgery for restoring the permeability of the small intestine there is a significant violation of the functional state of the liver. It was the basis for prescribing the antioxidant therapy to the commonly accepted treatment.

Using of the drug Reamberine promotes the effective correction of the protein synthetic function of the liver, the decreasing of inflammation and stagnation in the hepatocytes, the reduction of the endogenous intoxication and postoperative complications.

Keyword: intestinal obstruction, hepatocytes, Reamberine, endogenous intoxication.

1. Introduction

One of the actual problems of urgent surgery, which plays an important role in the structure of morbidity and mortality in surgical hospitals, is an acute small intestine obstruction (ASIO) [1]. The unsuccessful treatment outcomes in patients with ASIO primarily associated with the syndrome of endogenous intoxication (EIS), which runs the complex nonspecific mechanisms [2, 3]. As a result of the rapid development of EIS caused depletion and inhibition of hepatocyte function. This allows pathological "metabolic cascade", formed as a result of the destruction of cell membranes by release of lysosomal mitochondrial enzymes, move from organ to systemic level, accompanied by inhibition of autoregulation homeostasis, which has bad life prognosis [4]. In terms of toxicity and hypoxic respiratory chain of mitochondria lose the property to accept electrons from substrates other than succinic acid, which is one of the intermediates of the Krebs cycle and the second substrate complex of the respiratory chain of mitochondria. Because of this, many energy-dependent processes in cells occur during the oxidation of succinic acid [5]. Additional admission of exogenous succinic acid significantly adds to the energy shortage in the body [6].

General clinical and biochemical parameters which characterize of liver failure, are often sings of decompensated liver function [7,8]. Therefore, an important task is to search for new methods of assessment of the early development of liver failure in patients with ASIO which will allow time to apply of adequate measures of intensive therapy for correcting of the pathological changes in the liver and prevention of the formation of

multiple organ failure and the development of complications after treatment [8].

The purpose of study was to investigate of correction of early liver insufficiency by Reamberine solution in patients with ASIO.

2. Material and Methods

We observed of 232 persons, including 202 patients with ASIO, aged from 30 to 80 years hospitalized in Central City Clinical Hospital of Ivano-Frankivsk in 2008-2012 period. Among the patients were 98 men (48.5%), 104 women (51.4%) and 30 almost healthy individuals. Reasons of ASIO were: strangulated hernia - 56 (27.7%) patients, including postoperative 22 (10.8%) patients, strangulated intestinal obstruction - 44 (27.7%) patients, adhesive intestinal obstruction - 63 (31%) patients, intestinal obstruction with blockage - 17 (8.4%) patients. All patients were divided into 2 groups: basic and control. Patients of basic group additionally used Reamberine solution ("Polisanum") for 400-800 ml (depends of illness grade), twice a day intravenous (infusion speed – 90 gtt per min) before operation and 5 days after operation.

The functional status of liver was detected by organ-specific enzymes activity detection: arginase (Arg) by I. Chiparo method with V.A. Khramov modification, cholinesterase (CE) by G.G. Listopad method, alkaline phosphatase (AP) by spectrophotometry method (with Lachema test-systems, Czech Republic), ceruloplasmine (C) by G.A. Babenko method.

Statistical analysis of the survey results was performed using MS Excel 07 based on MS Windows 98 and analysis program Analys+Soft, 2007. Inspection of the distribution of samples for normality was performed with the number of variations using the criterion of the Shapiro-Wilke. To test the hypothesis of equality of the average values Student-Fisher criterion was used for normal distributed samples and Wilcox-Mann-Whitney criterion for samples which distribution is different from the normal.

3. Results and Discussion

Before and after operation the changes of functional liver probes were observed, which correlated with stage of ASIO and its duration (see table).

The activity of Arg was significant increased to 0,530±0,014 mcmol/0, 1 ml (normal range - 0,293±0,017 mcmol/0, 1 ml), what is result of hepatocytes membranes penetrability disturbance. During treatment in patients of basic group this values decreased to 0, 46±0, 04 mcmol/0, 1 ml for 4-5 days. At the end of treatment period activity of Arg was 0, 30±0,005 мкмоль/0, 1 mcmol/0, 1 ml and didn't return to the normal levels.

The activity of CE, as protein-synthetic marker of liver, was significant lower in patients before treatment: 54, 2±0, 95 mccat/l, compare normal range - 84, 45±1, 54 mccat/l. In control group this value increased during treatment: 68, 4±0, 2 mccat/l – at 5-th day and 70, 5±1, 55 mccat/l at end of treatment. In patients with additional using of Reamberine this activity increased more significant: 77, 2±1, 80 mccat/l at 5-th day, and was normalized at the end period of treatment.

At hospitalization the AP activity significant increased to 2, 12± 0,026 mccat/l compare normal level 1, 58 mccat/l. This enzyme shows the liver congestion. In control group patients at 5-th day we didn't see the significant dynamics: 2, 06 ± 0,025 mccat/l. This value was normalized at the end treatment period: 1, 88± 0, 02 mccat/l.

Management by Reamberine caused more significant decrease of AP acivity at 5-th day: 1, 70± 0,025 mccat/l.

Analyses of combined surgical treatment of patients with ASIO showed that additional use of Reamberine caused to decrease of postoperative complications frequency for 1.2 times and purulent-septic for 2.3 times. Postoperative mortality was 17.21% in control group and 8.92% in basic group. The in-hospital period was reduced from 19.2 bed-days to 17 bed-days.

4. Conclusions.

1. Reperfusion of small intestine which are result of renew of passability caused of functional liver

status disturbances which need of intensive therapy.

2. Use of Reamberine solution which have antioxidative and liver-protection properties caused of stabilization of cytoplasmatic membranes of hepatocytes and normalizing of its function.

Table: The dynamics of the functional status of liver values in patients with ASIO

Period after operation	Groups of patients	CE activity (mccat/l)	AP activity (mccat/l)	Arg activity (mcmol/0,1 ml)	CP conv. un
Norma		84,45±1,54	1,58±0,02	0,29±0,01	29,4 ±0,88
Before operation		60,0±0,95**	2,16±0,02	0,53±0,014	22,1± 0,78
1st Day	Control	60,2±0,92**	2,12±0,02	0,54±0,01	19,25± 0,29
	Basic	59,8±1,0	2,22± 0,03	0,55±1,012	19,48± 0,26
5th Day	Control	68,4±1,80*	2,08± 0,02	0,46±0,04*	22,26 ±0,23
	Basic	77,2±1,80*	1,94± 0,01*	0,35±0,02*	25,9 ±0,26
14 th Day	Control	70,5±1,55**	1,98 ±0,02*	0,39±0,14*	26,56 ±0,26
	Basic	83,2±1,34	1,69 ±0,01*	0,30±0,005*	27,18± 0,21

Remarks: significance before and after treatment *-p<0, 05; **p<0, 01

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