

Comparative Analysis of Intestine Microflora During Peritonitis by Application of Proposed Method and Decompression of Three-channel Tube

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ABSTRACT

Application of a three-channel tube for correcting of intra-intestine status during peritonitis enables us to obtain data on pathological changes at different levels of intubated gastro-intestine tract and elaborate effective method for stage-by-stage correction of the revealed disturbances with medications. The investigation of quantitative and qualitative contents of the small intestine microbial flora via a three-channel tube in patients with peritonitis strongly confirmed serious failures in vegetation processes of microbes. The study results were consistent with the data of available literature, that points out that naso-gastro-intestine intubation without relevant inter-intestine drug treatment fails to appropriately correct a number of pathological processes that are likely to develop in gastro-intestinal tract during enteral insufficiency. In addition, we determined substantial differences in quantitative and qualitative contents of microflora. These data confirm that elaboration and application of intra-intestine status stage-by-stage correction method have proved its value pathogenetically. The method enables us to prevent with maximal effect further development of enteral insufficiency by rational selection of medications.

KEYWORDS: *peritonitis, microflora*

It is believed that endogenous intoxication syndrome is admitted as one of the most important factor in determining of severity and case-fatality of peritonitis [1,2,3]. The follow up course of such kind of operations is heavily affected by so-called "intestine insufficiency" syndrome that promotes endogenous intoxication and actually transfers the small intestine into impassable pustule.

Considering that the toxic intestine content substantially contributes to the formation of endotoxemia level in an organism, it is appropriate to refine and accomplish such methodologies that enable us to diminish the magnitude of "intestine factor" in formation of endogenous intoxication [4,5,6].

Three-channel tube of original construction was used for decompression of intestine. One channel of the tube drains stomach and duodenum, the second one - jejunum and the third - ileum. The apparatus provides adequate compression of all parts of the small intestine and contributes to equal distribution of administered preparations.

The goal of our study was to analyze and assess clinical effectiveness of intra-intestine status correction complex schemes during post operation period.

The proposed method consists of the following three components:

1. To affect abundant bacterial colonies in intubated parts of gastro-intestinal tract by hypochlorit NaOCl.

In selecting of NaOCl concentration to be administered into intubated parts we relied on the results of Maistrenko's [8] experimental and clinical investigations, according to which the optimal concentration of the preparation that provides bactericide effect and doesn't induce toxic effect on epithelial structures, constitutes 0.06-0.09%. The preparation of 0.9% concentration in the amount of 100 ml was administered into each channel of tube twice a day with a 12-hour interval between the administrations. In order to ensure curative effect of NaOCl, a tube was turned off for 30-40 minutes and administration of the preparation was initiated at an operation table.

2. To bound up (fix) microbes and toxic substances by means of starch-stabilized substances of carbon enterosorbent "Belosorb II".

100 ml starch gel (2 kg starch per 100 ml water) of 0.3 t. sorbent was administered into jejunum and ileum (50-50 ml into second and third channels) twice a day per 1 kg of a patient. Enterosorption was started an hour following NaOCl administration.

3. To colonize the small intestine with physiological strains of microbes. Bacterial preparation "Bactolakt" suspension was used for this purpose. It presents lyophilized mass of lactobacillus acidophilus lactic acid bacteria.

Bactolakt was administered into the second and third channels of a tube (into jejunum and ileum intestines) twice a day in 5 - 5 portions (50×10^{18} microbial cells).

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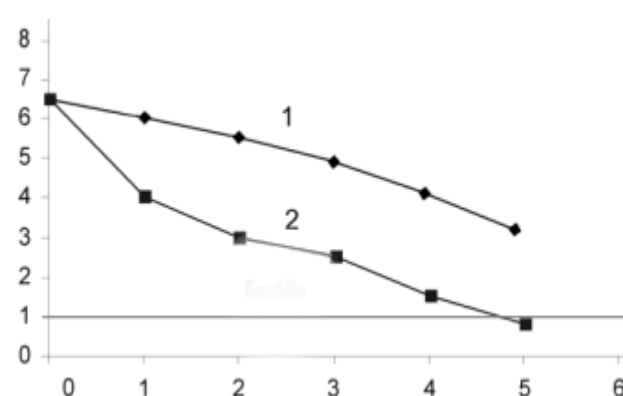


Fig.1 Number of microbes in stomach and duodenum intestine during decompression (1) and the application of the proposed method (2).

In order to study the effectiveness of the proposed intra-intestine status correction we conducted comparable analysis in two groups of patients. The control group was composed of 44 patients, who underwent only decompression via a three-channel tube. The study group was composed of 38 patients, to whom the proposed

method of enteral insufficiency syndrome correction was applied.

The patterns of pathology, surgical intervention and medical treatment in these two groups of patients were almost similar.

Of 44 control patients aged 21-78, 38 patients were men, 26 - women. Toxic stage of peritonitis was noted in 46 cases, terminal - in 18 (II). Of 38 patients of the study group aged 19-70, who underwent the intra-intestinal correction, 36 developed toxic stage, 12 - terminal.

Considering that abundant colonization of intubated part of gastro-intestinal tract and toxic intestine content impact on post-operation course in terms of complication, we conducted comparable analysis of contents (on toxicity) taken from different parts of the gastro-intestinal tract and analyze quantitative content of microflora among the control and study groups of patients.

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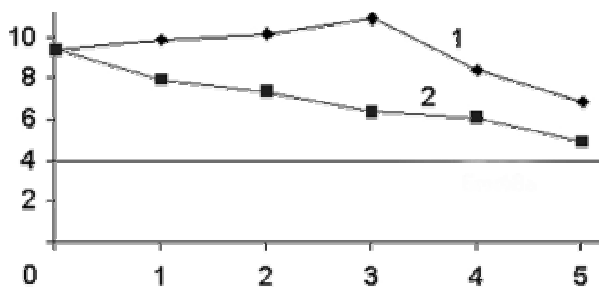


Fig.2 Number of microbes in jejunum during decompression (1) and the application of the proposed method (2).

Our investigations showed that during operation the number of microbes in 1 ml of the content of stomach and duodenum intestine in control and study groups 1000-fold exceeded the normal level.

During the post-operation course the number of microbes gradually decreased in both groups. The indicator did not reach the normal level in controls at the moment of removing tube whilst the number of colony-induced

microbes in 1 ml of the content reached the permissible level on the fourth day of operation.

The investigation of the given indicator in the content of jejunum and ileum showed that during the intra-operational period number of microbes exceeds the norm by 4-5 order units.

In the control group the growth of colonies in 1 ml of the intestine contents of both intestines was not observed on the second and third days of operation. Later on the trend reversed but at the moment of removing tube, the number of microbes in the jejunum and ileum intestines exceeded the norm. An apparent decline in the general number of microbes in 1 ml of intestine content in the study group was observed from the first day of operation. The trend further remained unchanged and at the moment of removing tube the number of microbes approached the normal indicator characteristic for this time-span of operation.

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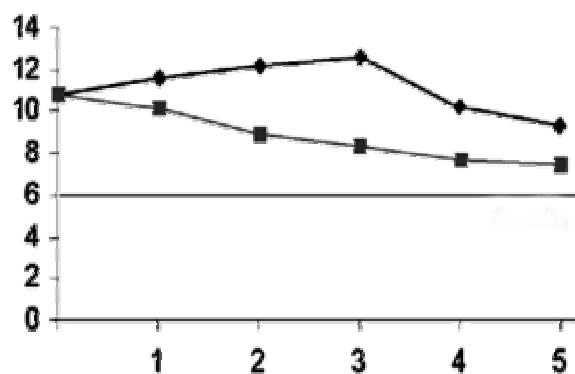


Fig.3 Number of microbes in ileum during decompression (1) and the application of the proposed method (2).

The results demonstrate that the elaborated method of inter-intestinal status correction enables us to obtain considerably greater effect in correcting of pathological changes during peritonitis in contrast with compression.

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Сравнительный анализ кишечной микрофлоры при перитоните с использованием декомпрессии трехпросветного зонда

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Р Е З Ю М Е

Применение для коррекции внутрикишечного статуса при перитоните трехпросветных желудочно-кишечных зондов позволило не только получить данные о патобиологических изменениях на различных уровнях интубированного желудочно-кишечного тракта, но и разработать эффективную методику поэтапной медикаментозной коррекции выявленных нарушений. Проведенные исследования количественного состава кишечной микрофлоры при использовании трехпросветного зонда достаточно убедительно свидетельствуют о грубых расстройствах процессов вегетации интестинальных микроорганизмов у больных перитонитом. Они характеризуются резким возрастанием их количества, качества и колонизацией проксимальных отделов пищеварительного тракта микрофлорой терминальных отделов кишечника. Полученные результаты соответствовали данным литературы, согласно которым назогастроинтестинальная интубация без соответствующей внутрикишечной медикаментозной терапии не позволяет адекватно корригировать многообразные патобиологические изменения, происходящие в желудочно-кишечном тракте в процессе развития синдрома энтеральной недостаточности. Вместе с тем, нами установлены существенные различия количественного и качественного состава микрофлоры. Эти данные свидетельствуют о том, что разработка и использование методики поэтапной коррекции интраинтестинального статуса патогенетически оправданы и при рациональном выборе лекарственных препаратов позволят наиболее эффективно купировать синдром энтеральной недостаточности у этой категории больных.

Ключевые слова: перитонит, микрофлора