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Immunological Changes In Patients Operated On Peritonitis

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Restoration of cellular and humoral immunity observed in patients with local peritonitis, which shows the activeness and adequateness of the immune system, which is capable to localize inflammatory process that does not require additional immunological correction. Adverse of immunological profile and its dynamics in patients with diffuse and diffuse peritonitis, which is defined by the following trends : low rates phagocytosis (phagocytic number < 3, phagocytic index < 40) during treatment, low CD3 lymphocytes (>50%) at the beginning of the disease and no tendency to increase their number to the 7-th day, low immunoregulatory index (< 1,5%) at the onset that no increases to 7-th day (N = 2-2,5); poor CD4 in combination with increased levels of CD8 on the 3-rd, 7-th day, lack of CD22 (< 20%) with no increase in their level on the 3-rd day,7-th , low IgG (< 9,0 gm \ l) in combination with high IgA, IgM (so-called scissors) that do not change on the 3-rd and 7-th day and tend to decrease its level during treatment - it is urgent to show immunoglobulin replacement therapy.

Keyword: Peritonitis, Immunologia.

1. Introduction

According to modern ideas, important role in the etiopathogenesis of peritonitis plays endogenous intoxication, leading to high mortality 20 - 45% and in terminal patients to 50 - 95%[1, 2]. Disadvantages in the treatment of patients with postoperative peritonitis are the slow recovery of cellular and humoral immunity, slower regeneration processes at the expense of immune status , which increases as far as the duration of intoxication and the transition process from the stage of toxic reactive, and toxic to the terminal. The immune system in end-stage can be regarded as a "paralysis" of her as a dramatic inhibition (immunosuppression), or even the lack of immune protection in the body. This indicates the need of treatment of substitution and stimulating immunotherapy in patients with peritonitis[3, 4].

The aim was to study the changes in the immune system in patients operated on peritonitis.

2. Materials and methods

We examined 245 patients with peritonitis. The age of patients ranged from 18 to 93 years. Men were - 116 women - 129. As part of comorbidities frequently encountered diseases of the cardiovascular system - 215 (87,7%), varicose veins of the lower extremities - 136 (55,5%), diseases of the respiratory system - 71 (28,9%), neuro- endocrine disorders - (diabetes - 26 (10,6%), obesity - 64 (26,1%), a history of liver disease - 37 (15,1%).

There were 80 patients with local, 65 with diffusive peritonitis, 100 with spilled peritonitis.

To study the immunological reactivity in patients with various forms of peritonitis we investigated cellular and humoral immunity, nonspecific resistance of the organism. The study was conducted in patients with local, diffuse and spilled peritonitis before surgery on the 3rd and the 7th day after surgery. In particular it was

defined level of CD3, subpopulation of CD4 and CD8, natural killer CD16. Immunoregulatory index (CD4/CD8), the level of CD22, the level of total IgG, IgA were determined. Nonspecific resistance was studied by determining the number of phagocytes (SF) and phagocytic index (FI) in the latex test. Also there were studied indicators of endotoxin immunity: antiendotoxin level of antibodies IgG was defined.

Before surgery the patients were underwgone preoperative preparation: infusion therapy to reduce toxicity, correction of fluid and electrolyte balance, eliminating hypovolemia. To reduce toxicity and decompression of the gastrointestinal tract were injected nasogastric tube, gastric was lavage performed, treatment and siphon enemas.

3. Results of the study and their discussion.

Established that the various forms of peritonitis at the time of admission there were changes in cellular immunity. There was not a high initial level of CD3, and probably lower in diffuse and spilled peritonitis (53,04±1,63 % 52,3±0,97%), low CD4 (40,45±1,24%, 40,21±1,13 % 39,16±1,11%) and immunoregulatory index CD4/CD8, (1,68±1,21%, 1,62±1,01%, 1,66±0,48%), low levels of CD22, are not sufficient indicators of phagocytic activity: phagocytic number (3,46±0,51, 3,34±0,21, 3,31±0,72), FI (38,86±0,96%, 38,51±0,74% 38,44±0,6%). However, with local peritonitis shifts of Immunogram were less expressed authentically profound changes are observed in diffuse and especially in spilled peritonitis ($p1<0.05$, $p2< 0,05$).

Such deviations are associated with pain syndrome and induced him stress as a result of the release of catabolic hormones that block the migration of immune cells from the thymus of the one part, and the redistribution of circulating lymphocytes from the vasculature into damaged tissue from the other side. Subsequently, in the next 7th days in the normal course of inflammation under the influence of cytokines will activate cell maturation in the thymus, activation, bonuses and proliferation of blood lymphocytes and as a consequence, the total number of lymphocytes in the peripheral blood will increase. Clinically, in the normal course of the process of inflammation and adequate immune response is a positive trend observed.

In our study, on the 3-rd day there was further decrease in CD3 (49,20±1,29%, 47,31±1,21%, 45,35±0,28%), with all types of peritonitis, but spilled peritonitis, and this level was significantly lower ($p1<0,05$, $p2<0,005$) than with local peritonitis. In diffuse peritonitis on the 7th day of CD3 remained low (42,63±1,15%) - this is not a favorable prognostic trend. At the local and diffuse peritonitis contrast, the level of CD3 (62,3±1,21%, 54,31±1,31%) increased on the 7th day, which is a positive prognostic sign. When the local peritonitis increase was 21%, while diffuse only 12,9%. Initial level of CD4 on admission was determined as the lower limit of normal. At the onset of the disease CD4 count was at local peritonitis 40,45±1,24%, with diffuse 40,21±1,13%, spilled at 39,16±1,11%, respectively, was in the lower limit of normal in all versions of peritonitis.

Reliably number of CD4 continued to decline on the 3rd day in all patients (39,31±2,53% 35,3±1,83%, 36,41±1,49%), which is natural. On the 7th day with local peritonitis increased number of CD4 (41,7±1,21%) with diffuse, especially spilled did not return to baseline (39,7±1,10%, 35,02±129%). The dynamics of CD4 level is poor prognosis, sign not sufficient activation of protective regulation of specific immunity.

Dynamics of CD8 cytotoxic lymphocytes is the following: the first day in diffuse peritonitis and spilled their blood was significantly higher (26,32±1,36%, 28,2±1,04%) than local (23,40±2,39%). Later on the 3-rd and 7-th days with spilled peritonitis, their number decreased (34,3±1,56% 21,7±2,74%), and in diffuse remained at the same level (24,3±1,83%, 26,7±1,41%), indicating a stable active inflammation and no tendency to fade.

CD4/CD8 Ratio called immunoregulatory index is a reliable criterion which reflects the level of activation of cellular immunity in inflamed. With the active inflammatory process, he should be in the range of 2–2,5. In patients with peritonitis immunoregulatory index was low at the beginning (1,68±1,21%, 1,62±1,01%,

1,66±0,48%), critically low on day 3 (1,55±0,99%, 1,51±1,26%, 1,49±0,72%) and slightly increased on the 7th day but did not reach the level of 2,0 or with one embodiment of peritonitis. It is also a marker of inflammation and flow criterion immunotropic destination therapy.

Humoral immunity in patients with peritonitis on admission was characterized by low baseline levels of immunoglobulins IgG and IgM and IgA normal levels. In particular, the level of IgG was 9,57±1,53 gm/ l at local, 9,43±1,47 gm/ l in diffuse and 9,31±1,22 gm/ l in diffuse peritonitis at onset. These figures are lower limit of normal in all three groups and were not significantly different. Later, when local peritonitis, adequately IgG levels increased. In diffuse and spilled it decreased to a critical level (below 9 gm/l) 3-rd (8,17±1,31 gm/l 6,29±1,34 gm/l) and 7th day (7,71±1,29, 6,11±1,41), respectively, which is extremely unfavorable and requires urgent maintenance immunotherapy in the form of intravenous immunoglobulin. Thus patients with diffuse and spilled peritonitis beginning from the 3rd day, a steady increase in IgM, IgA (1,10±0,12 gm/l, 1,01±0,31 gm/l) in all longitudinal control measurements. IgM and IgA are immunoglobulins of acute phase, have sufficient specificity for localization of aerial activity and efficient completion of the inflammation, but in low levels of IgG are partly in compensation may assume its functions.

The dynamics of the 3rd to the 7th day level of IgG in the local peritonitis (9,20±1,63 gm/l, 10,96±2,1 gm/l) increased, while during diffuse (8,17±1,31 gm/l, 7,71±1,29 gm/l) and spilled (7,79±1,34 gm/l, 7,11±1,41 gm/l) decreased. Since IgG is highly specific immunoglobulin, the level of which depends on the effectiveness of the immune response and protection against infection, it is in the normal course of the inflammatory process should increase its level at least twice. Therefore, low levels of IgG is a direct sign of profound immune deficiency and prerequisite complicated course of peritonitis and clear criteria for prognosis of immunological inflammation.

The demonstration proved the growth dynamics of CD22, which is typical of the producers of immunoglobulins. These data correlate with the state -specific humoral immunity - the level of antibodies in the respective groups of patients. Thus, in patients with local peritonitis set a clear tendency to increase their number of CD22 8,31±1,53% in early disease 1,12 to 16,4% by day 7th. In contrast, patients with diffuse peritonitis, which marked decrease in the number of CD22 8,33 8,12±1,2% to 1,10% and further. In patients with diffuse peritonitis, the level of CD22 is from 8,4±1,6% at admission, and continued to decline progressively to 7,34±1,21% on the 7th day. This means that the body reserves are exhausted in relation to the production of antibodies, and in this case the only urgent replacement of immunoglobulin therapy is possible for effective treatment.

A similar trend was found in the analysis of indicators of nonspecific immunity. Low levels of phagocytosis in the onset and during treatment clearly indicate severe intoxication, not perfection processes destroy antigens, which creates preconditions to profound disorders of the immune responses and predicts the development of complications. In patients with local peritonitis rates of phagocytosis: upgraded to 3-rd and maximum on the 7th day: SF phagocytic number (from 3,46±0,51 to 6,30±042) and phagocytic index FI (38,86±0,96, 52,12% to 0,27%) with diffuse peritonitis did not change significantly (38,51±0,74%, 43,31±1,04%, 48,31±0,38%), while diffuse peritonitis continued to decline (35,4±0,94%, 34,1±0,31%) and remained so in 85% of patients and this is another prerequisite to an unfavorable prognosis.

4. Conclusions

1. Restoration of cellular and humoral immunity observed in patients with local peritonitis, which shows the active and adequate the immune system capable of localized inflammatory process that does not require additional immunological correction.

2. Adverse immunological profile and its dynamics in patients with diffuse and diffuse peritonitis, which is defined by the following

trends: low of rates phagocytosis (phagocytic number < 3, phagocytic index < 40) during treatment, low CD3 lymphocytes (> 50%) at the beginning of the disease and no tendency to increase their number to the 7th day, low immunoregulatory index (< 1,5%) at the onset that no increases to 7th day (N = 2-2,5); poor CD4 in combination with increased levels of CD8 on the 3-rd, 7-th day, lack of CD22 (< 20%) with no increase in their level on the 3rd day,7th , low IgG (< 9,0 gm\l) in combination with high IgA, IgM (so-called scissors) that do not change on the 3rd and 7th day and tend to decrease its level during treatment it is urgent to show immunoglobulin replacement therapy.

5. References

1. Сепсис и полиорганная недостаточность / Саенко В.Ф., Десятерик В.И., Перцева Т.А и др. – Кривой Рог: Минерал, 2005,466с.
2. Полянський І.Ю. Лікувальна тактика при гострому перитоніті / І.Ю.Полянський // Шпитальна хірургія. 2004; 4С:28-30.
3. PD-1 expression by macrophages plays a pathologic role in altering microbial clearance and the innate inflammatory response to sepsis /X.Huang *et al.* Proc Natl Acad Sci USA 2009; 14(106):6303-6308.
4. Рамн ВИ. Чиссов ОА, Якубовская РИ .Лечение тяжелых послеоперационных гнойно-воспалительных и септических осложнений с использованием антиоксидантных препаратов. Хирургия 2008; 11С:14.