

OPTIMIZATION OF DIAGNOSTICS AND TREATMENT OF A SYNDROME OF ENTERAL INSUFFICIENCY AND SYNDROME OF THE SYSTEM INFLAMMATORY RESPONSE IN THE ACUTE PERIOD OF BURN DISEASE

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ABSTRACT — This work is devoted to studying of dynamics of the maintenance of sCD14, as a potential marker of early diagnostics of development of syndrome of enteral insufficiency and syndrome of the system inflammatory response at a burn disease at children.

KEYWORDS — sCD14, enteral insufficiency, burn disease.

Patients with burn pathology represent a certain interest in the contest of studying of changes of permeability of intestinal canal and risk of development of polyorgan insufficiency as according to various authors from 3,3 to 22% of adult patients have various complications from a gastrointestinal tract, the part of patients among children is even higher [3, 6, 7]. On some evidence, the burning injury can result also in incompetence of barrier mechanisms of a gastro-intestinal tract, with the subsequent invasion of pathogenic and opportunistic microorganisms in blood. Also, intestinal canal is given one of the leading roles in development of the systemic inflammation response syndrome and polyorgan insufficiency [1, 2]. The lethality from polyorgan insufficiency takes a dominating position among other reasons of mortality at a burning injury at children, and makes more than 50% from total number of cases [11]. It should be noted that, according to many researchers at the heart of sepsis development including burning, the complex of the reactions developing in an organism of the patient in reply to a microbic invasion are placed. The main starting factor of development of systemic inflammation response syndrome is considered release by endotoxin by gram-negative microorganisms, main active principle is liposaccharide (LPS) [5, 10].

The aim of the research is improvement of results of treatment of children with a heavy burning injury by means of effective diagnostics of a syndrome of intestinal insufficiency and a syndrome of the system inflammatal response syndrome and optimization of performed therapies.



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MATERIALS AND METHODS.

The results of treatment of 24 injured children with the burning injury, passing treatment in anesthesiology and intensive care department No. 1 of Regional children's clinical hospital named after Silishcheva N.N. in the city of Astrakhan are studied in the work. All observations were made during the prospective study carried out from 2009 to 2012. The clinical methods of research including an assessment of complaints of the injured child, the general condition, detailed, physical examination were used in the work. The area of burn wounds determined by rules of "nine" and "palm". Depth of burnings was defined according to classification of the 27 congress of surgeons in the USSR (1961). For an objectification of an assessment of weight of a burning injection the area and severity index, offered by H. Frank (1960) was used. The assessment of weight of burning shock, was carried out on A.A. Popova's classification (in modification of N.P. of Shen) [9]. In total 24 injured children had a shock-producing, burning injury of the I–II degree, with an index of Frank from 25 to 45 c.u. The age of the surveyed children made from 1 year to 3 years. Damaging thermal factor in all cases is boiled water. As criteria of an exception the patients having accompanying diseases of the gastro-intestinal tract before

receiving a burning injury. Circumstances of an injury and localization of burnings weren't considered in the work. From injured children 2 groups on 12 children were created groups (basic and control), similar on age, sex, the area and depth of damages (Table 1). The domestic enterosorbent of "Polisorb MP" was included in the scheme of treatment of the early period of a burning disease to children from the main group.

Table 1. Characteristics of injured children ($M \pm m$)

index	Basic group	Control group
Area of burning injury	18,2 ± 2,5%	20,5 ± 1,5%
Index Frank	28,6 ± 3,4 c.u.	29,2 ± 2,2 c.u.
age	1,5 years ± 1,3 month	1,7 years ± 1,2 month

As a perspective marker, for studying of violation of permeability of intestines at a burning disease at children, we chose sCD14 definition (dissolved CD14 of a receptor) in serum of blood of the patient. The research sCD14 was conducted with the help of a "sandwich" method of the solid-phase immunoferrmental analysis. Research was conducted by means of "Hbt human sCD14 ELISA" set (HyCult biotechnology b.v. Netherlands). Also it was carried out microbiological researches of excrements of children with a burning injury. Microbiological researches of quantitative and qualitative composition of excrements were carried out according to methodical recommendations in the Russian Federation [8].

RESULTS OF THE RESEARCH AND THE DISCUSSION

The analysis of the conducted research showed that throughout the early period of a burning disease the sCD14 level in serum of patients of control group exceeded the sCD14 level in serum of patients of the basic group against enterosorbition application. At the end of the first days average values of indicators of sCD14 of the basic and control groups exceeded the limit of standard parameters specified by manufacturing firm of a laboratory set (2–4 ng/ml). In the basic group average sCD14 value made 4,17 ± 0,29 ng/ml that was reliable below, in comparison with control group where this indicator equaled to value 6,65 ± 0,64 ng/ml ($P < 0,05$). At the end of 3 days, the sCD14 levels reached the peak values in both groups and made 7,57 ± 0,78 ng/ml (the basic group) and 9,71 ± 1,57 ng/ml (control group). Further, gradual decrease in indicators of sCD14 is noted, for the 5th days after the got burning injury average values basically and control groups made 5,2 ± 0,27 ng/ml and 7,03 ± 0,52 ng/ml respectively. For the 7th day of a burning disease the

maintenance of sCD14 in the basic group (5,4 ± 0,2 ng/ml) was authentic less ($p < 0,05$), in comparison with control group (6,79 ± 0,72 ng/ml), however both indicators considerably exceeded laboratory standards (Fig. 1).

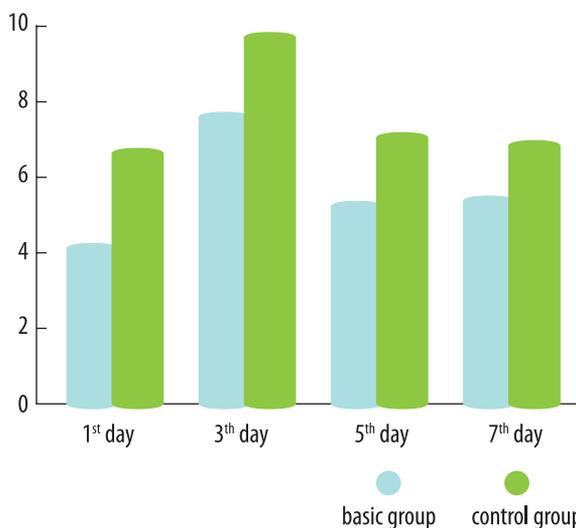


Fig. 1. Change of the level sCD14 in dynamics

Results of microbiological researches revealed the following changes. By the end of the first day after the got burning injection in the basic group it wasn't noted violations of a fecal microbiocenosis, in comparison with control group where at 16,6% of patients changes in a microbiocenosis were recorded. These changes were shown, in the form of reduction of quantity of an coliform organism with normal properties (10^5 – 10^6) that corresponded to dysbacteriosis of the I degree. In the researches which have been carried out on the 10th days, in the basic group 16,6% of patients with changes of a microbic landscape of intestines characteristic for dysbacteriosis of the 1 degree are recorded, for comparison the number of patients with similar violation in control group made 33,3% from number of patients in the group. Dysbacteriosis of the II degree was noted at 8,3% of patients from the basic group and 25% of patients from control group respectively. Violations were shown in the form of decrease in quantity of lactobacilli (10^5) and bifid bakterium (10^7), a coliform organism with normal properties, increase in quantity of a coliform organism possessing hemolytic properties. Half of patients of control group with dysbacteriosis of the II degree had moderate increase of representatives of the sort Proteus (10^4 – 10^5). Dysbacteriosis of the 3 degrees was diagnosed only in control group for 8,3% of patients. Violations of a fecal

Table 2. Comparison of the statement of microbiocenosis of intestinal canal at the children

Day of a burning disease	Group	Number of injured people	Degree of disbacteriosis			
			I	II	III	IV
1 st day	Basic group	12	0	0	0	0
1 st day	Control group	12	2	0	0	0
10 th day	Basic group	12	2	1	0	0
10 th day	Control group	12	4	3	1	0

microbiocenosis were shown in the form of considerable decrease in lactobacilli ($<10^5$) and bifidobacterium (10^5), increase of quantity of a coliform organism with the reduced enzymatic activity (10^8), a coliform organism possessing hemolytic activity (10^7). Increase of representatives of the genus *Pantoea*, *Citrobacter*, *Proteus* (10^5 – 10^6) was noted, emergence of mushrooms of the genus *Candida* was noted at these patients (Table 2).

CONCLUSION

- 1) On the basis of the undertaken research, we suppose that increase of the concentration of sCD14 in serum of blood can be used as a test for identification of "a translocation syndrome" and intoxication of an organism of LPS of gram-negative bacteria at a burning disease at the children.
- 2) Studying of dynamics of the concentration of sCD14, showed that the greatest body burden from LPS of gram-negative bacteria falls on the third day after receiving a burning injection.
- 3) Inclusion in therapy of the early period of a burning disease of an enterosorbent of "Polisorb MP" showed the efficiency in the form of sCD14 level reduction in blood serum, and also severity of violation of a fecal microbiocenosis.

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