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DIAGNOSTICS AND EMERGENCY CARE FOR SEPTIC SHOCK IN CHILDREN

Resume: Sepsis is one of the complex problems of modern medicine, the relevance of which is determined by the growing number of patients, high mortality and high economic costs associated with treatment and rehabilitation.

The problem of sepsis is multifaceted and includes issues of etiology and pathogenesis of severe infections proper, pathogenesis of multiple organ failure, antibacterial therapy, methods of temporary organ substitution, intensive care of emergency conditions.

This article presents the features of the clinical course of septic shock in children, their consequences and issues of emergency care, which are one of the urgent problems today.

Keywords: septic shock, emergency care, diagnosis and treatment.

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ДИАГНОСТИКИ И НЕОТЛОЖНОЙ ПОМОЩИ ПРИ СЕПТИЧЕСКОМ ШОКЕ У ДЕТЕЙ

Резюме: Сепсис — одна из сложных проблем современной медицины, актуальность которой определяется ростом количества пациентов, высокой летальностью и большими экономическими затратами, связанными с лечением и реабилитацией.

Проблема сепсиса многогранна и включает в себя вопросы этиологии и патогенеза собственно тяжелых инфекций, патогенеза полиорганной

недостаточности, антибактериальной терапии, методов временного органозамещения, интенсивной терапии неотложных состояний.

В данной статье представлены особенности клинического течения септического шока у детей, их последствия и вопросы оказания неотложной помощи, которые сегодня являются одной из актуальных проблем.

Ключевые слова: септический шок, неотложная помощь, диагностика и лечение

The relevance of the problem. Sepsis is the leading cause of death in children, resulting in approximately 7.5 million deaths per year[2]. The most severe manifestation of sepsis is septic shock, a condition accompanied by severe disorders of systemic hemodynamics, tissue perfusion and cellular metabolism[3]. Refractory septic shock is the main cause of the development of multiple organ failure syndrome, which occurs in 100% of patients and is the direct cause of death[1].

According to the World Health Organization, sepsis is the cause of deaths in diseases such as pneumonia, gastrointestinal infections, malaria and measles, which are characterized by a severe course[5]. One of the most dangerous pathogens of community - acquired sepsis and septic shock is meningococcus . Mortality in the generalized form of meningococcal infection (GFMI) remains high - 8-15%, reaching 40-80% with septic shock[4].

In the USA alone, 72000 children are hospitalized with sepsis every year. At the same time, the mortality rate is 25%, and the economic costs of treatment are estimated at \$ 4.8 billion[6].

One of the promising therapeutic strategies for the treatment of septic shock in children is extracorporeal hemocorrection (ECG), however, currently it is rarely used in routine clinical practice, and most of the publications are devoted to adult patients, which was the basis for this study[1].

The purpose of the study. Evaluation of the role of systemic inflammatory reaction syndrome in the pathogenesis of septic shock complicating the process in children, observation of the relationship between treatment tactics and severity of systemic inflammatory reaction syndrome, its effect on the clinical course and prognosis of the disease.

Materials and methods of research. During the study, 46 of these children were hospitalized in the intensive care unit within the first 3 hours after the shock, no later than 6 hours after the development of cardiogenic shock.

The results of the study and their discussion. All patients had an infection of various localization. When identifying the causes of the development of CS, it turned out that in children with burns, the deterioration of the condition occurred after necroectomy of the burn wound sites. The expanded toilet of the burn wound and the removal of necrosis sites carried out under anesthesia, as well as the use of enzymes for lysis of these sites could serve as a "breakthrough factor" of toxins into the bloodstream. The same "trigger mechanism" of the development of CS could occur in a child with peritonitis after repeated surgery to sanitize the abdominal cavity from the remaining purulent areas.

A 10-year-old child with a boil of the upper lip had a "breakthrough" of infection at home after self-squeezing out the focus of infection. The patient was admitted to the hospital with the phenomena of pronounced SH. In 2 children with pneumonia, CS could develop due to the prolonged presence of a subclavian catheter (more than 6 days). In these cases, infection may have developed in the catheter lumen, and infusion of solutions or manipulation of the catheter could serve as a "breakthrough factor".

In all patients, the deterioration of the condition occurred with the appearance of signs of septic syndrome or CVD. They had hyperthermia of more than 38 °C, leukocytosis of more than $12 \cdot 10^9/l$. In 1 child with a boil of the upper lip, leukopenia ($3.9 \cdot 10^9/l$) was detected in the blood test. Also, in all

patients, septic syndrome was accompanied by tachypnea exceeding the norm by 25% or higher, and tachycardia.

SH was accompanied by impaired consciousness, hypoxemia, oliguria. In all but one of the children, CS developed in the hospital, which is consistent with the literature data on the iatrogenic nature of this complication.

It was revealed that not all children had severe sepsis (sepsis with signs of organ dysfunction) before the development of SS. In most cases (n=8), SH began suddenly after surgical and medical manipulations ("breakthrough factors"), and was later regarded as severe sepsis. The diagnosis of SS was made if the following signs appeared in patients with septic syndrome or sepsis: 1) systolic blood pressure did not rise above the lower value of the norm, despite the high rate of infusion or the use of vasopressors; 2) oliguria (less than 0.5 ml / kg / hour), despite adequate administration of fluids; 3) respiratory failure; 4) severe metabolic acidosis.

In most cases (n=6), the diagnosis of CS was made in the II late stage (cold hypotension), when the skin was pale, blood pressure was low.

In the early stage of SH (warm normotonia or hypotension), 3 children were admitted to the ICU, whose skin was hyperemic due to a decrease in peripheral vascular tone, an increase in cardiac output. At the same time, there was relative hypovolemia (CVD below 50 mmHg). The diagnosis of SS was made mainly when hypotension developed.

Conclusion. The algorithm of ECG application, including prolonged veno-venous hemodiafiltration and hemoperfusion with polymyxin as part of complex intensive therapy of septic shock in children, has been substantiated and put into practice.

It has been shown that the use of prolonged veno-venous hemodiafiltration and hemoperfusion with polymyxin in the complex intensive therapy of septic shock in children provides the fastest possible regression of acute cardiovascular and respiratory insufficiency, improving patient survival.

The indications were clarified and an algorithm for the application of ECG methods in children with septic shock was developed.

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