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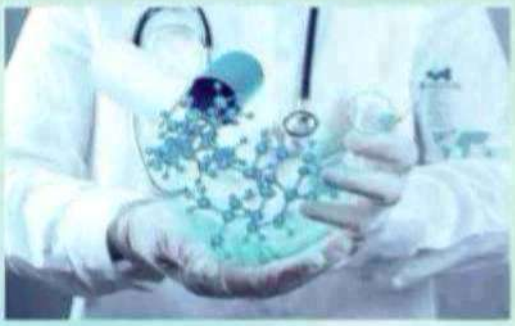

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PROGNOSTIC METHOD OF PREDICTING THE DEVELOPMENT OF SYSTEMIC INFLAMMATORY RESPONSE IN CHILDREN OF THE FIRST YEAR OF LIFE

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✓ ***Resume***

Systemic inflammatory response syndrome (SIRS) is a life-threatening condition with nonspecific symptoms. As a result, identifying targeted therapies for SIRS in children and adults remains a challenge. In children of the first year of life, due to anatomic-physiologic and immunologic peculiarities, SIRS proceeds according to special clinical and laboratory scenarios, different from those in adults and even in older children.

The problem of early diagnosis and appropriate correction of SIRS in infants is of high clinical significance, as this condition may be the first manifestation of sepsis, necrotizing enterocolitis, congenital infections and other life-threatening diseases. At the same time, nonspecificity of symptoms, limited severity of fever and other signs of inflammation complicate early diagnosis.

Key words: systemic inflammatory response syndrome,D-dimer test, sepsis.

Relevance

Actual issues include the search for acceptable diagnostic definitions of the generalization of the infectious process and the possibility of predicting the course of the disease, as well as the search for methods to evaluate the effectiveness of treatment for young children with sepsis from the perspective of evidence-based medicine.

The standard examination (medical history, physical examination, complete blood count, and urinalysis) does not always allow for a diagnosis, especially in the early stages of an acute illness. Currently, leukocytosis and C-reactive protein (CRP) are used as markers of inflammation, confirming the bacterial origin of the disease. However, in pediatric practice, an increase in these indicators does not always indicate a bacterial infection, which leads to unjustified antibiotic treatment. In addition, CRP is a marker with moderate sensitivity and insufficient specificity, which requires further research.

The aim of the study. To establish clinical and laboratory risk factors for the development of a systemic inflammatory response and to develop prognostic criteria in infants during their first year of life.

Materials and methods

To solve the tasks set, we examined 110 children aged from 5 days to 1 year, of which 1 group consisted of 60 children with SIRS and 2 group consisted of 50 children with pneumonia.

The clinical examination included: a thorough medical history to identify risk factors for sepsis. An objective examination was performed, taking into account anthropometric data: body weight, height, and their ratio.

Among all those surveyed, the ratio of boys to girls was 1.7:1. In both observed groups, boys outnumbered girls.

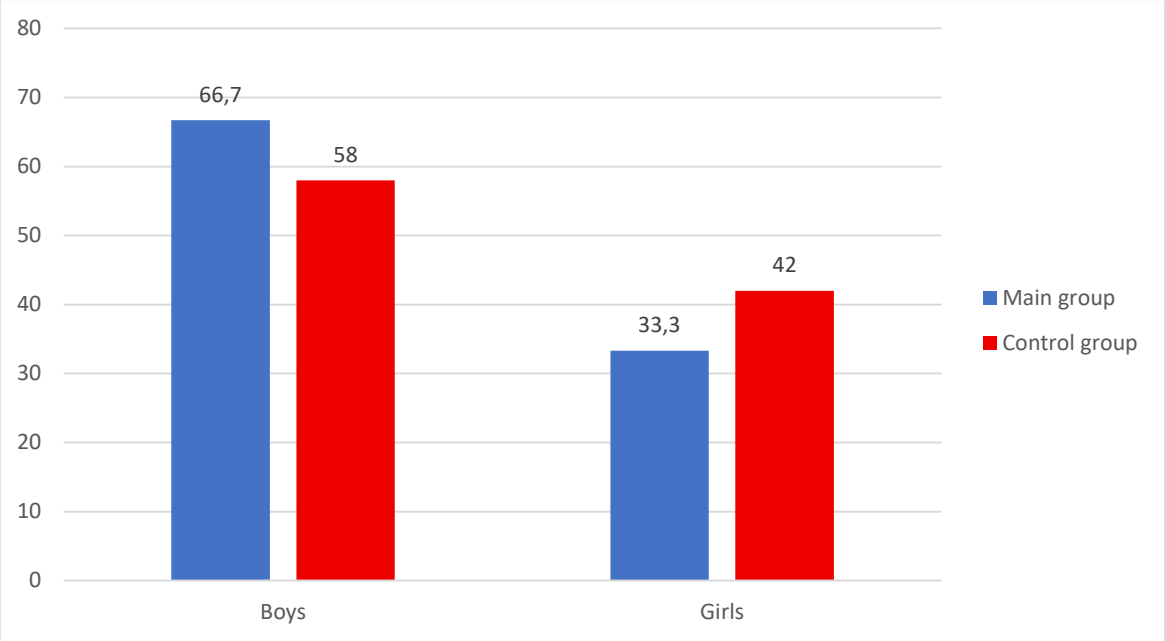

Figure 1. Gender distribution of children surveyed in groups.

The diagnosis of SIRS in children and infants was established in the presence of at least two of the criteria listed below, one of which was a change in temperature or white blood cell count.

- central temperature above 38.5 °C (in premature infants - above 38.0 °C) m or below 36 °C.
- tachycardia in the absence of external stimulation, ongoing therapy, or painful irritants; idiopathic increase in heart rate for 0.5-4 hours in children younger than one year of age.
- bradycardia in the absence of external vagal stimulation or congenital heart disease without the use of β-blockers, as well as idiopathic bradycardia lasting 30 minutes or longer.
- tachypnea or mechanical ventilation caused by an acute pathological condition in the absence of neuromuscular diseases and post-anesthesia respiratory depression.
- increase or decrease in the number of leukocytes for a specific age, the ratio of immature neutrophils exceeds 10% (in premature infants - 20%) with a C-reactive protein concentration of more than 10 mg/L.

Result and discussions

The study included 60 children who developed SIRS against a background of pneumonia (main group) and 50 children (comparison group) with acute pneumonia without clinical signs of SIRS.

Systemic inflammatory markers have prognostic significance for the development of cardiovascular complications in infants with pneumonia.

It has been established that a D-dimer level above 1500 ng/mL, combined with C-reactive protein (CRP) levels exceeding 7.0 ng/mL and procalcitonin levels above 2.0 ng/mL, is associated with a high risk of developing cardiovascular complications.

Table 1. Clinical characteristics of patients included in the study

Clinical parameters of the children examined	**Main group (n=60)**	**Control group (n=50)**
Extragenital pathology: total	55 (91,7%)	36 (72,0%) **
Anemia in mothers	42 (70,0%)	22 (44,0%)*
Acute infectious diseases during pregnancy	50 (83,3%)	22 (44,0%) **

Pregnancy toxicosis	42 (70,0%)	26 (52,0%) *
Preeclampsia	10 (16,7%)	1 (2,0%) *
Character of labor: rapid, protracted Caesarean section	18 (30,0%) 4 (6,7%) 8 (13,3%)	0 (0%) 0 (0%) 7 (14,0%)
Asphyxia during childbirth	43 (71,7%)	3 (6,0%)***
Gestational age (weeks)	39,2±0,3	38,2±0,3*
Birth weight (g)	3348±50,5	3406,7±68,7
Actual weight (g)	7882,5±327,8	9740,4±254,3***
Height at birth (cm)	51,4±0,22	51,6±0,28
Frequency of occurrence of pneumonia with bronchial obstruction Complications Cardiovascular (Heart) Failure 1 degree 2 degrees	19 (31,7%) 12 (20,0%) 2 (3,3%)	3 (6,0%) ** 8 (16,0%) 0 (0,0%)
Anemia 1 degrees 2 degrees 3 degrees	36 (60,0%) 14 (23,3%) 1 (1,7%)	32 (64,0%) 21 (35,0%) 1 (2,0%)
Rickets	25 (41,7%)	8 (16,0%) *
Allergic diathesis	3 (5,0%)	2 (4,0%)
Lymphatic-hypoplastic diathesis	15 (25,0%)	9 (18,0%)

Table 2. Indicators of systemic inflammation in children in the compared groups

	Main group	Control group	Control
D-dimer	3284,7±494,7*	1734,7±239,6*^	352,3±124,3
procalcitonin	7,6±0,9*	1,9±0,3*^	0,5±0,02
CRP	12,7±2,4*	7,4±0,5*^	3,4±0,12

Conclusion

Early recognition and prediction of the course of SIRS, which is a serious emergency condition in childhood, is of great importance for preventing infant mortality. Diagnosis and prediction of its development using a pathometric method based on this approach allows for the timely implementation of adequate emergency measures, preventing the development of an unfavorable outcome.

LIST OF REFERENCES:

1. Markwart, R.; Saito, H.; Harder, T.; Tomczyk, S.; Cassini, A.; Fleischmann-Struzek, C.; Reichert, F.; Eckmanns, T.; Allegranzi, B. Epidemiology and burden of sepsis acquired in hospitals and intensive care units: A systematic review and meta-analysis. // Intensive Care Med. 2020;46:1536–1551.
2. Agnello, L.; Bivona, G.; Parisi, E.; Lucido, G.D.; Iacona, A.; Ciaccio, A.M.; Giglio, R.V.; Ziino, O.; Ciaccio, M. Presepsin and Midregional Proadrenomedullin in Pediatric Oncologic Patients with Febrile Neutropenia. // Lab. Med. 2020;51:585-591.
3. Velissaris, D.; Zareifopoulos, N.; Karamouzos, V.; Karanikolas, E.; Pierrakos, C.; Koniari, I.; Karanikolas, M. Presepsin as a Diagnostic and Prognostic Biomarker in Sepsis. // Cureus 2021;13: e15019.
4. Bone, R.C.; Balk, R.A.; Cerra, F.B.; Dellinger, R.P.; Fein, A.M.; Knaus, W.A.; Schein, R.M.; Sibbald, W.J. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. The ACCP/SCCM Consensus Conference Committee. American College of Chest Physicians/Society of Critical Care Medicine. // Chest 1992;101:1644–1655.
5. Singer, M.; Deutschman, C.S.; Seymour, C.W.; Shankar-Hari, M.; Annane, D.; Bauer, M.; Bellomo, R.; Bernard, G.R.; Chiche, J.D.; Coopersmith, C.M.; et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). // JAMA 2016;315:801-810.
6. Brady, J.; Horie, S.; Laffey, J.G. Role of the adaptive immune response in sepsis. // Intensive Care Med. Exp. 2020;8:20.
7. Shashikumar, S.P.; Stanley, M.D.; Sadiq, I.; Li, Q.; Holder, A.; Clifford, G.D.; Nemati, S. Early sepsis detection in critical care patients using multiscale blood pressure and heart rate dynamics. // J. Electrocardiol. 2017;50:739-743.
8. Kataria Y.; Remick D. Sepsis Biomarkers. Methods Mol. Biol. 2021; 2321:177-189.
9. Bellia, C.; Agnello, L.; Lo Sasso, B.; Bivona, G.; Raineri, M.S.; Giarratano, A.; Ciaccio, M. Mid-regional pro-adrenomedullin predicts poor outcome in non-selected patients admitted to an intensive care unit. Clin. Chem. // Lab. Med. 2019;57:549-555.
10. Yipp, B.G.; Winston, B.W. Sepsis without SIRS is still sepsis. // Ann. Transl. Med. 2015;3:294.

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