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Bogutska N.K.

DIAGNOSTIC SIGNIFICANCE OF MARKERS OF SEVERE COURSE OF NEONATAL SEPSIS ACCORDING TO DIFFERENT CLINICAL SCALES

Department of Pediatrics and Pediatric Infectious Diseases
Bukovinian State Medical University

Introduction. Neonatal sepsis is a common disease with a prognostic high mortality rate, even in highly developed countries. The severity of the disease during hospitalization is a recognized factor in predicting morbidity and mortality, therefore, in order to standardize the severity of the condition of newborns in neonatal departments special clinical scales are used that take into account different degrees of dysfunction of organs and systems. A comparative analysis of eight different clinical scales for assessing the severity of the neonatal sepsis and hypothetical laboratory markers of its severity is relevant.

The aim of the study was to determine the diagnostic value of markers of severe course of neonatal sepsis in order to improve its diagnosis and treatment.

Material and methods: by the method of simple random sampling a cohort of 60 children of neonatal age with verified early or late neonatal sepsis were examined. The severity of the course of the disease was assessed comprehensively according to eight different clinical scales (CRIBII (Clinical Risk Index for Babies II); SNAP (Score for neonatal acute physiology); SNAPII, SNAPPEII (Score for neonatal acute physiology with Perinatal Exrension); PEMOD (Pediatric Multiple Organ Dysfunction); PELOD (Pediatric Logistic Organ Dysfunction); NEOMOD (Neonatal Multiple Organ Dysfunction Score); SOFA (Sequential Organ Failure Assessment): the main clinical group was formed by patients with higher than average scores on clinical scales for assessing the severity of the condition, and the control group included children with lower than average scores.

Results. Very low birth weight (≤ 1500 g) significantly increased the risk of severe neonatal sepsis according to the CRIBII, SNAP, SNAPII, SNAPPEII, PEMOD, PELOD, NEOMOD, SOFA severity assessment scales, and extremely low birth weight – according to the CRIBII and SNAPPEII scales.

Table.

Diagnostic value of the laboratory markers of the severe course of early and/or late neonatal sepsis in subgroups according to different clinical scales

Clinical scales and markers	Diagnostic value, %		Risk indices	
	Sensitivity	Specificity	Odds ratio (95% CI)	Relative risk (95% CI)
An increase in interleukin 6 > 60 pg/ml as a marker of severe course of sepsis in newborns				
SNAP	63 (35-85)	69 (48-86)	3,8 (1,0-13,9)	2,2 (1,1-4,4)
SNAPII	63 (35-85)	78 (56-93)	6 (1,5-25)	2,7 (1,1-6,3)
SOFA	58 (28-84)	63 (42-81)	2,4 (0,6-9,5)	1,8 (0,9-3,6)
An elevation of presepsin > 1000 ng/ml as a marker of severe course of sepsis in newborns				
SNAP	60 (33-84)	73 (52-88)	4,1 (1,1-15,7)	2,3 (1,1-5,0)
SNAPII	60 (33-84)	80 (56-94)	6 (1,3-27)	2,5 (1,0-6,7)

The chances of a severe course of neonatal sepsis significantly increased by 1.8-2.7 times if the severity of the condition was assessed according to the SNAP, SNAPII or SOFA scales when the interleukin-6 content in the blood serum of newborn children increased to more than 60 pg/ml. An elevation of presepsin > 1000 ng/ml in blood serum significantly increased the chances of a severe course of neonatal sepsis by 2.3-2.5 times when assessing the severity of the condition according to the SNAP, SNAPII scales (see table). Due to higher specificity and negative predictive value, presepsin and interleukin-6 within normal ranges are recommended to be used as markers for excluding severe neonatal sepsis.

Conclusions. Very low birth weight significantly increased the risk of severe course of neonatal sepsis according to all clinical scales. A comprehensive epidemiological analysis of the diagnostic significance of inflammatory biomarkers of neonatal sepsis (presepsin and interleukin-6) allows to predict a more severe course of the disease using the SOFA, SNAP or SNAPII clinical scales.