

Issued since 1920

2019

VOLUME 55 SUPPLEMENT 1

MEDICINA

- ABSTRACTS

International Scientific Conference
on Medicine

77th International Scientific Conference
of the University of Latvia

February 22, 2019
Riga, Latvia

ISSN 1648-9233

Forecasting of kidney damage in neonates with asphyxia

Andrii Loboda

Sumy State University, Sumy, Ukraine

Background. The frequency of newborn asphyxia varies from 1 to 1.5%. A disturbance of kidney function in neonates with asphyxia occurs in 45-50%.

Aim. The aim of the work is create a system of prognosis kidney damage in newborns with asphyxia.

Methods. Investigation included 200 full-term newborns with disturbance of kidney function: 100 infants who had severe asphyxia, and 100 – with moderate asphyxia. Comparison group consisted of 20 healthy children without asphyxia. Clinical and anamnesis data, as well as laboratory parameters (level of biomarkers, enzymes, cytokines, etc.), parameters of macro- and microelement homeostasis on 1-2 days of life were analyzed. Mathematical prediction performed using Wald-Genkin's sequential procedure of statistical analysis with calculation the informative level for each sign.

Results. Most indicators of obstetric anamnesis showed a high predictive informativeness ($3.0 \geq I(x_i) \geq 1.0$) and may play role as risk factors of kidney damage in newborns with asphyxia. The three signs had the high level: the fetal distress ($I(x_i) = 2.19$), the threat of abortion ($I(x_i) = 1.77$) and entanglement an umbilical cord around the neck ($I(x_i) = 1.75$). Moderate predictive significance ($1.0 > I(x_i) \geq 0.50$) was typical for urinary tract infections in the mother during pregnancy. Among the neonatal indicators, respiratory distress demonstrated the highest informative level ($I(x_i) = 6.71$). High informativeness was associated with a low Apgar score on the 1st ($I(x_i) = 4.36$) and the 5th minute ($I(x_i) = 3.62$), with male gender ($I(x_i) = 1.82$), peripheral ($I(x_i) = 1.55$) or brain edema ($I(x_i) = 1.10$). Kidney damage is also associated with: low blood pH < 7.25 ($I(x_i) = 3.00$), reduced partial pressure of oxygen in blood < 50 mm Hg ($I(x_i) = 7.06$), serum neuron-specific enolase > 56.2 ng/ml ($I(x_i) = 8.17$), serum cystatin C > 2600 ng/ml ($I(x_i) = 8.63$), urinary IL-18 > 25 pg/ml ($I(x_i) = 1.76$), serum IL-6 > 35 pg/ml ($I(x_i) = 4.13$), serum TNF α > 8.5 pg/ml ($I(x_i) = 7.21$), serum IL-10 > 10 pg/ml ($I(x_i) = 7.25$), serum gamma-glutamyl transpeptidase (GGT) > 120 nmol/l ($I(x_i) = 4.08$) urinary GGT > 47 nmol/(sec*1) ($I(x_i) = 2.20$), as well as serum K > 4.5 mmol/l ($I(x_i) = 2.68$), urinary Ca > 0.8 mmol/l ($I(x_i) = 5.69$), serum Pb > 0.200 mmol/l ($I(x_i) = 7.08$).

Conclusions. The most informative factor for prognosis of kidney damage in newborns with asphyxia is serum cystatin C. Among non-invasive markers for confirm kidney injury in newborns in critical condition due to asphyxia should recommended urinary interleukin-18, gamma-glutamyl transpeptidase and calcium.

Acknowledgements. There is no conflict of interests. This study was performed with financial support from the Sumy State University.