THE ROLE OF VASCULAR ENDOTHELIUM AND HEMOSTASIS IN THE DEVELOPMENT OF HYPOXIC CENTRAL NERVOUS SYSTEM INJURIES IN NEWBORNS

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***Objective**: The aim of the study was to investigate the state of the hemostasis system and vascular endothelium in newborns with hypoxic lesions of the nervous system.*

Materials and methods: A total of 35 newborns of varying gestational ages with hypoxic nervous system injuries were under observation. Blood samples for assessing the parameters were collected from umbilical cord blood in a volume of 5.0 mL. The distribution of the newborns into groups was as follows: - Group I consisted of healthy newborns. - Group II included 10 infants who had experienced acute asphyxia during childbirth and were born to healthy mothers. The third group consisted of 13 newborns who had experienced chronic intrauterine hypoxia. Several hemostatic parameters were examined, including Prothrombin Time (PT), Prothrombin Index (PI) according to Quick, International Normalized Ratio (INR), Activated Partial Thromboplastin Time (APTT), fibrinogen, Thrombin Time (TT), and the specific marker of endothelial dysfunction, endothelin 1.

Results and discussion. When examining the hemostatic parameters, including PT, INR, APTT, TT, in the umbilical cord blood of newborns with acute and chronic hypoxia, changes were identified. However, these changes did not show statistically significant differences. Among the hemostatic parameters, only the fibrinogen level in the examined newborns showed a statistically significant difference between healthy newborns and those who had experienced chronic intrauterine hypoxia, with a difference of up to 3.96±0.58 g/L, $p1 < 0.01$. This difference was not statistically significant in newborns with acute asphyxia and chronic hypoxia, with $p2 > 0.2$. Meanwhile, both newborns who had experienced chronic and acute hypoxia showed an increase in the level of endothelin-1, with values of 1.24±0.36 pg/mL and 1.06±0.24 pg/mL, respectively, which was statistically significant ($p < 0.001$).

Conclusion. Thus, as a result of the conducted research, it was found that in cases of hypoxic damage to the nervous system in newborns, the vascular endothelium is the primary responder, leading to the activation of hemostatic and cerebral blood flow disturbances.