

**isuog2026.31c03a4 PERINATAL FACTORS ASSOCIATED WITH HYPOXIC-ISCHEMIC BRAIN LESIONS
IN NEWBORNS WITH CONGENITAL HEART DISEASE (CHD)**

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Objectives

To study perinatal risk factors for preoperative hypoxic-ischemic changes in the brain in children with various hemodynamic types of congenital heart defects (CHD).

Methods

In a prospective observational study of a cohort of 116 "pregnant mother - child" pairs, divided into groups of 42/116 (36.2%) CHD with depleted systemic blood flow; 38/116 (32.8%) - with hypervolemia of the pulmonary circulation; In 30/116 (25.8%) cases with hypovolemia of the pulmonary circulation and 6/116 (5.2%) cases with the presence of vascular rings around the trachea and esophagus, without disturbances of systemic or pulmonary blood flow, an analysis of maternal, fetal, and placental factors was performed, as well as the results of preoperative ultrasound neurosonography and multispiral computed tomography (MSCT) of the brain of newborns with CHD.

Results

In the overall study cohort, fetal biparietal diameter <10th percentile was observed in 18.1% of fetuses, estimated fetal weight (EFW) <10th percentile – in 17.2% of cases, decreased cerebroplacental ratio (CPR) <5th percentile – in 16.4% of cases, 9.5% of infants were small for gestational age, placental weight <10th percentile was noted in 13.8% of cases, without statistically significant difference between the groups.

According to the results of neurosonography, pathological changes were detected in 23.9% of children, according to the results of MSCT, hypoxic-ischemic changes in the brain were detected in 83.3% of newborns.

A significant increase in the risk of hypoxic-ischemic brain injury in neonates with CHD (relative risk 1.32-1.36; 95% CI 1.09-1.69) was associated with decreased placental mass, cerebral perfusion, and placental weight

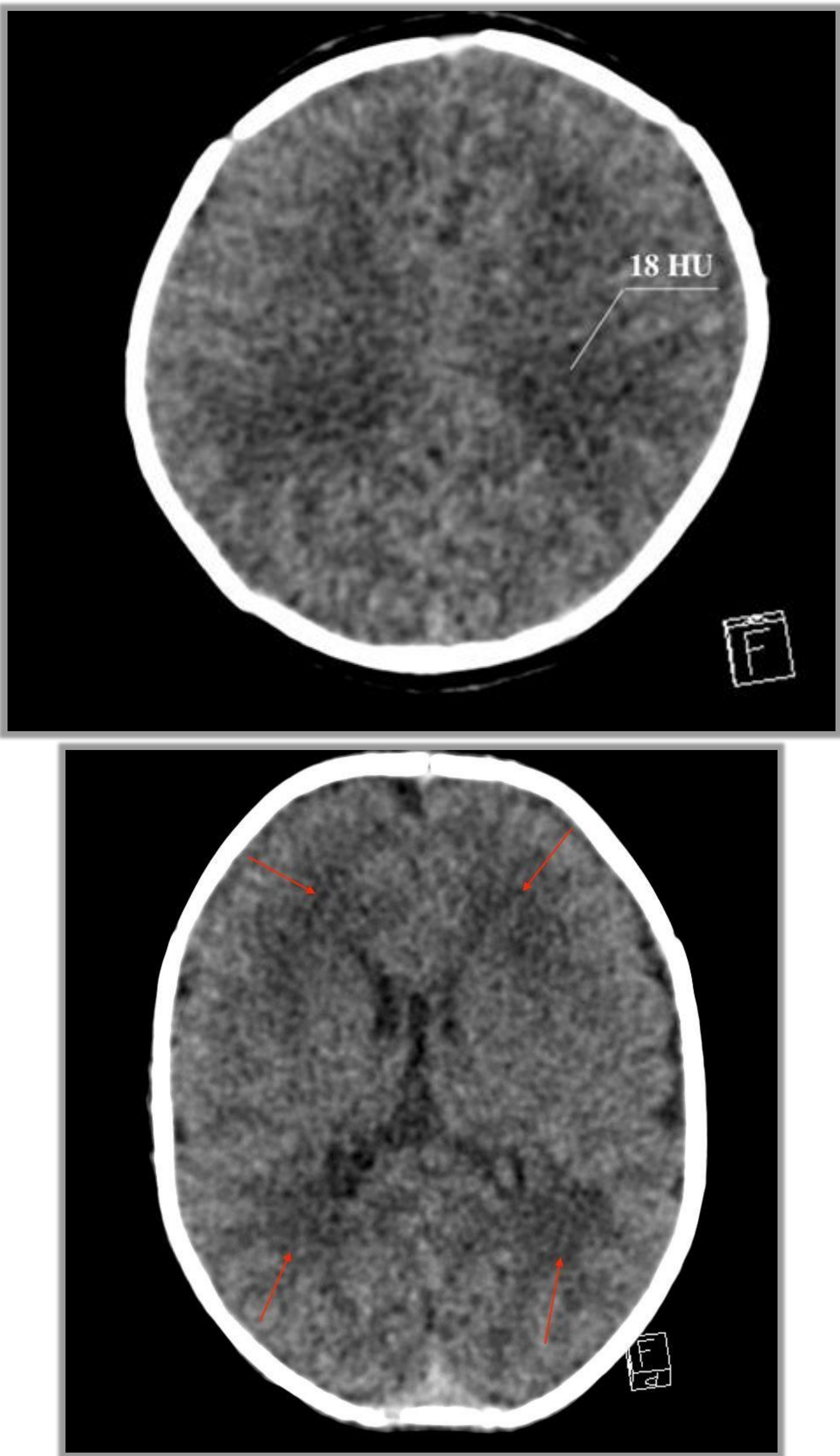


Figure 1 - CT scan of the brain of a child with congenital heart disease at the age of 1 day: diffuse decrease in white matter density.
Figure 2 - CT scan of the brain of a 7-day-old child with congenital heart disease (CHD): diffuse decreased white matter density periventricularly on both sides. Indicated by red arrows.

CONCLUSION:

The high frequency of hypoxic brain injury detection in neonates with CHD at the preoperative stage indicates the need for combined models for the diagnosis, prediction, and prevention of fetal cerebral hypoxia.