

The improvement of Echo Criteria to determine the hemodynamic significance of PDA among premature neonates

*Kulikova D.A., Buchneva O.V., Safonova I., Pisklova Y.V., Krylova O.S., Shafer Y.V.
Institute of General and Urgent Surgery, Department of Cardiac surgery, Kharkiv, Ukraine*

Introduction: Annually the number of premature labors grows, causing urgent need to improve diagnostics and treatment of premature infants in a neonatal ICU. The PDA is one of the most common conditions among such children. It is diagnosed in more than 40% of infants with weight less than 1500 gr. The PDA considerably aggravates patient's condition, increases risk of complications in the bronchopulmonary system, CNS, GIT and limits life expectancy. In many countries the method of choice for treatment is a surgical ligation of PDA. The uniform diagnostic criteria and indications for this procedure among premature infants are nowadays a pending issue. We introduced new ECHO's diagnostic criteria to determine the PDA's hemodynamic significance.

Methods: Between 2010 and 2017 - 187 patients were examined with the preliminary diagnosis of hemodynamically significant PDA. In addition to the standardized ECHO criteria we developed a new method: the percentage of blood flow in PA which originated in PDA in the ratio of pulmonary trunk area (PTA). Patients were distributed by the following groups: hemodynamically insignificant PDA – the area of blood flow - 10%, the average hemodynamic importance from 10-30% of PTA and the obvious hemodynamic significance – the area of blood flow from PDA was more than 30% of the PTA.

Results: All 187 patients were distributed in the following groups: hemodynamically insignificant PDA – 9 (4,81%) patients, the average hemodynamic importance – 101 (54,01%), the obvious hemodynamic significance – 77 (41,18%). 8 (4,28%) patients from the second group were reevaluated and transferred to the third group. On the basis of these criteria, PDA was ligated in 85 (45,45%) premature newborns. The gestational age of children varied from 24 to 33 weeks (28,00±0,54 weeks), the weight – from 600gr to 2000gr (1218,67±63,42). All children were intubated since their birth, had pneumonia and affected CNS in perinatal period, IRDS. The surgery was done on the 10-34 day of life in neonatal ICU.

Conclusions: The study optimized echocardiographic indications for surgical ligation of PDA. The new criterion developed and applied by us showed good results. The method's sensitivity is 90,59%.