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Implementation of a new protocol for Patent Ductus Arteriosus medical closure in premature infants less than 28 weeks and 1000 grams: practice in a French level-III hospital

Elie Ghossoub

Paris-Decartes University, France

Pulmonary hemorrhage is frequently associated with hemodynamically-significant Patent Ductus Arteriosus (hsPDA) especially in premature infants, and considered a major risk for mortality and morbidities in this population. We have studied pulmonary hemorrhage incidence in extreme premature infants after the implementation of a new protocol of early ultrasonographic diagnosis followed by ibuprofen-based treatment. In 2016, a new protocol was introduced for early diagnosis and treatment within the first 24 hours of life of premature infants born less than 26 weeks of gestation and/or less than 1000 grams. Three of the 4 criteria present on cardiac ultrasound (12 to 24 hours of life) were needed to confirm hsPDA: Left atrium/Aorta ratio > 1.5 mm, Ductus arteriosus diameter > 1.5 mm, Transductal flow velocity < 2 m/sec and mean left pulmonary artery velocity > 0.2 m/sec. We realized a study divided into 2 parts. The first one was retrospective of children born from September 2015 to August 2016 (PDA-1) and the second prospective of children born from September 2016 to May 2017 (PDA-2). 55 premature infants were illegible for the study: 31 in PDA-1 cohort and 24 in PDA-2 group. We noticed a tendency to a reduction in the incidence of pulmonary hemorrhage in PDA-2 compared to PDA-1 cohort (4.3% vs. 29.1% respectively; $p = .055$) but not statistically significant. The survival rate was increased by third in PDA-2 group (91.5% vs. 67.7%; $p=.033$). Screening and early-treatment of a hsPDA did not show a significant reduction of pulmonary hemorrhage incidence, but increased the survival rate of infants born less than 26 weeks of gestation and/or less than 1000 grams by third.

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