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Early Pulmonary Hypertension in Extremely Premature born Infants: Results from a prospective cohort study (Neolifes-Heart)

Arjaans S. (1), Fries M.W.A. (1), Roofthooft M.T.R. (1), Kooi E.M.W. (2), Vrijlandt E.J.L.E. (3), Bos A.F. (2), Berger R.M.F. (1)
Department of Pediatric Cardiology, University of Groningen, University Medical Centre Groningen, the Netherlands (1);
Department of Neonatology, University of Groningen, University Medical Centre Groningen, the Netherlands (2);
Department of Pediatric Pulmonology, University of Groningen, University Medical Centre Groningen, the Netherlands (3)

Introduction: Early pulmonary hypertension (PH) is known to complicate the course of extreme preterm born infants. However, prevalence of early PH in this population is insufficiently known. The aim of this prospective cohort study was to determine prevalence and risk factors of early PH. Also its association with subsequent development of bronchopulmonary dysplasia (BPD) was assessed.

Methods: In a single-centre prospective cohort study in the University Medical Centre Groningen from June 2015 until November 2018, infants were included with a gestational age<30 weeks and/or a birth weight<1000 grams. Echocardiographic assessment for the determination of PH was performed in the first week of life (day 3-10). Neonatal and maternal clinical data (e.g. gender, gestational age, birth weight, Apgar score, presence of patent ductus arteriosus (PDA), presence of co-morbidities, preeclampsia, oligohydramnios, intra-uterine growth restriction, antenatal corticosteroids-use) were collected. BPD status and its severity were assessed at 36 weeks postmenstrual age (PMA).

Results: In total 94 infants were included. Early echocardiographic revealed PH in 40 of these infants (43%). Of the infants with PH, 26 (65%) infants subsequently developed BPD, where 11/26 (42%) infants developed severe BPD. In comparison, 20 of the 54 infants (37%) without early PH subsequently developed BPD, and 3/20 (15%) developed severe BPD. The presence of early PH was associated with the subsequent development of BPD (odds ratio (OR):5.01;1.89–14.68), and even stronger for severe BPD (OR:14.14;3.41–76.80). The presence of PH was associated with a low Apgar score after 1 minute, the presence of a PDA (OR:6.19;2.10–22.87) and the absence of antenatal maternal corticosteroid-use (OR:0.31;0.09–0.95). In total 8 infants died during the study, of which 5 infants had early PH.

Conclusion: Over 40% of infants born after a gestational age<30 weeks and/or a birth weight<1000 grams, presented with PH in the first 10 days of life. Low 1-min Apgar score, the presence of a PDA and the absence of antenatal corticosteroids, appeared risk factors for the presence of early PH. Furthermore, the presence of early PH was associated with the subsequent development of BPD, especially severe BPD at the age of 36 weeks PMA.