Role of early pulmonary hypertension as a risk factor for BPD severity and late pulmonary hypertension in extremely premature infants

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Background. Bronchopulmonary dysplasia (BPD) and pulmonary hypertension (PH) contribute to significant respiratory morbidity in extremely premature infants. The evidence on the role of early PH in the development of BPD and late PH in the extremely premature infants is limited.

Objectives. To determine incidence of early and late pulmonary hypertension in extreme premature infants. To determine clinical and echocardiographic features as risk factors for development of severe BPD and late PH.

Methods. Retrospective analysis of early echocardiograms (day of life 5-14) in premature infants 22^0 – 27^6 weeks gestation admitted to University of Iowa NICU between 07/01/2012 to 06/30/2015. Late echocardiograms performed for clinical suspicion of PH were also analyzed. PH was diagnosed by the presence of any of the following echocardiographic findings: an estimated right ventricular systolic pressure (RVSP) greater than 40 mm Hg, RVSP/systemic systolic blood pressure greater than 0.5, any cardiac shunt with bidirectional or right-to-left flow, or any degree of ventricular septal wall flattening. Severity of BPD was determined at 36 weeks of postmenstrual age (PMA).

Results. Out of 203 admissions <28 weeks, 154 infants met inclusion/ exclusion criteria and included in the study. Mean gestational age was 25.2 (+/- 1.4) weeks and mean birth weight was 775 (+/-192)g. Early pulmonary hypertension was diagnosed in 31 infants (20.1%). Twenty four (15.6%) infants including 6 patients who had early PH were evaluated for clinically suspected PH at mean PMA of 38.2 (+/-6.2). Eight infants (5.2%) including 2 patients who had early PH were diagnosed with late PH. Severe BPD was diagnosed in 91 infants (59%) and 4 (2.6%) infants died before discharge. Early PH was not significantly associated with severe BPD or death (p=0.95) or late PH (p=0.72).

Conclusion. Early PH is common among extremely premature infants (20.1%). 5.2% of infants had clinically detected late PH. Early PH was not significantly associated with severe BPD or death or late PH.