



The Capital Region of Denmark

Pulmonary hypertension in preterm infants admitted to a neonatal intensive care unit

Peter Schmidt, Ali Z, Dodd J, Jeppesen D.L

Dept. Pediatrics , Copenhagen University Hospital Hvidovre, Copenhagen, Denmark

Aim of study is to evaluate incidence of Bronchopulmonary dysplasia (BPD) and identify possible risk factors for developing BPD and Pulmonary Hypertension(PH) in infants with BPD.

Methods: Medical records of premature infants admitted in the period 2002-2010 were reviewed. 402 infants identified with a birth weight (BW) < 1500 g. 82 had BPD (need of oxygen at 28 postnatal days). Eight were excluded. The remaining 74 infants with BPD were evaluated. Differences in infants with and without BPD, with and without PH, with mild BPD and with moderate/severe BPD were evaluated with a student t –test, chi-squared test and multivariate analysis.

Conclusions: Invasive care strategies with excessive oxygen, mechanical ventilation and episodes of postnatal infections seem to aggravate lung function in premature infants and may lead to pulmonary hypertension in infants with BPD. More research in development and treatment of BPD complicated with PH is warranted. Regular screening with echocardiography for PH in infants with BPD is required.

Results: Incidence of BPD was 18%. BPD infants had significantly lower gestational age(GA) and BW than infants without BPD. Infants with BPD differ from infants without BPD. Infants with BPD had more often; intubation at birth, mechanical ventilation within 24 hours of birth, treatment of patent ductus arteriosus and laser treatment of retinopathy of prematurity (ROP), lower appgar score, days of CPAP treatment and days of mechanical ventilation. Fifty percent of infants with BPD developed moderate/severe BPD. Infants with moderate/severe BPD differed significantly from infants with mild BPD with respect to mechanical ventilation within 24 hours of birth, treatment with diuretics and laser treatment for ROP. 38% of infants with moderate/severe BPD developed PH. Versus 8% of infants with mild BPD. The incidence of PH was 4% amongst premature infants with BW<1500 gram and 23% amongst infants with BPD. Days of CPAP treatment, days of oxygen therapy, number of infants receiving diuretic therapy, intubation at birth and postnatal infection was higher among infants with PH and BPD, compared to infants with only BPD. Surfactant therapy and mechanical ventilation within 24 hours of birth were significantly associated with developing PH in BPD infants.

Comparison between BPD infants with and without pulmonary hypertension. § significant	Non-PH (n = 57)	PH (n = 17)	p-value
Gestational age, Mean, weeks	26.9	26,4	0.2983
Birth weight, mean, gram	924	836	0.2023
Multiple pregnancies, n (%)	19 (33)	2 (12)	0.0834
Vaginal birth, n (%)	20 (35)	4 (23)	0.3716
Surfactant, n (%)	28 (49)	6 (35)	0.3175
Tracheal intubation at birth, n (%)	17 (30)	11 (65)	0.0107§
Mechanical ventilation < 24 h after birth, n (%)	24 (42)	11 (65)	0.1014
Duration of CPAP, mean, days	51	87	0.0000§
Duration of intubation, mean, days	6,3	6,5	0.9584
Duration of O2, means, days	58	97	0.0001§
Need for O2 at 36 gestational age, n (%)	23 (40)	14 (82)	0.0023§
Treatment with diuretics, n (%)	18 (32)	12 (71)	0.0040§
APGAR 1, mean	6,7	5,9	0,2735
APGAR 5, mean	9,1	8,3	0,0865
ROP (operation), n (%)	7 (12)	4 (24)	0.2533
PDA (operation), n (%)	2 (4)	2 (12)	0.1913
PDA (indomethacin), n (%)	20 (35)	9 (53)	0,1859
Postnatal infection, n (%)	18 (32)	10 (59)	0.0420§

Gestational age (weeks)	BPD (n)	Birthweight	Pulmonary hypertension, n (%)
23	4	571-750	1 (25)
24	8	580-820	2 (25)
25	14	585-890	7 (50)
26	16	555-1046	3 (19)
27	13	530-1430	1 (8)
28	10	770-1415	1 (10)
29	7	920-1500	1 (14)
31	2	900-1396	1(50)