experiments were performed for 72 hours. The oxygen was re-charged every 12 hours, and the medium was changed every 24 hours. Apoptosis and cell numbers were measured every 24 hours. After 72 hours, the cells were collected and lysed. Protein concentrations, Cu/Zn-SOD and cellular GPx activities were measured by spectrophotometer.

Results: The SOD activity was highest under 60% oxygen concentration. However, the activity range was very large. The cellular GPx activity was highest under room air. The activity decreased under 60% and 80% oxygen concentrations. Exogenous nitric oxide may decrease the apoptosis percentage of PAEC under 60% oxygen concentration. However, it didn't affect antioxienzyme activity of PAEC under hyperoxic condition.

Conclusion: Hyperoxia suppressed cellular GPx activity in PAEC. This effect might contribute to the development of BPD in preterm infants.

494

PULMONARY OXYGEN UPTAKE CAPACITY IS REDUCED IN SCHOOL-AGED CHILDREN AFTER BRONCHOPULMONARY DYSPLASIA (BPD)

W. Thomas[1], M. Brunner[1], M. Beer[2], C.P. Speer[1], H. Hebestreit[1]

[1]Department of Pediatrics, University of Wuerzburg, [2]Department of Pediatric Radiology, Unversity of Wuerzburg, Wuerzburg, Germany

Background: Disturbed pulmonary vascularization and alveolar development are hallmarks of BPD in the era of surfactant therapy and antenatal steroids. Data on long-term functional consequences of these changes are scarce. The objective of our study was to assess aerobic fitness of formerly very low birth weight infants (VLBW) with and without BPD compared with children born at term and to identify factors accounting for group differences.

Methods: Fourty children aged 7.9-12.9 years volunteered for this study. Ten children had BPD, 15 were VLBW without BPD (non-BPD) and 15 formerly term infants served as controls (CON). Aerobic fitness was assessed as peak oxygen uptake, allometrically adjusted for body mass (VO_2peak_{adj}), during an incremental cycling task to volitional fatigue. Physical activity (PA) was expressed as relative time in moderate-and-vigorous PA (MVPA).

Results: The 3 groups did not differ in anthropometric indices. Although heart rate and respiratory exchange ratio at the end of exercise were identical among groups, VO_2peak_{adj} was lower in the BPD group (1329±149 ml/min) compared with non-BPD (1526±152 ml/min) and CON (1536±197 ml/min). MVPA was lower in VLBW (BPD 1.7±1.1%, non-BPD 2.2.±0.9%) compared with CON (4.4±1.1%). The difference in aerobic fitness was not explained by differences in PA. Several lung function parameters were decreased in BPD. Only adjustment for diffusion capacity abrogated the association of BPD with decreased aerobic fitness.

Conclusions: The impaired diffusion capacity and aerobic fitness of school-aged children with BPD indicate a long-term functional consequence of disturbed pulmonary vascular and alveolar development in the disease.

495

IMPAIRED SURFACTANT PROTEIN B SYNTHESIS IN INFANTS WITH CONGENITAL DIAPHRAGMATIC HERNIA

P.E. Cogo[1], M. Simonato[1], O. Danhaive[2], A. Baritussio[3], L. Vedovelli[1], F. Savignoni[2], F. Morini[2], G. Cobellis[4], V.P. Carnielli[5]

[1]Pediatrics, University of Padua, Azienda Ospedaliera di Padova, Padova, [2]Department of Medical and Surgical Neonatology, Bambino Gesù Children's Hospital, Roma, [3]Medical and Surgical Sciences, University of Padua, Azienda Ospedaliera di Padova, Padova, [4]Paediatric Surgery Unit, Academic Hospital of Ancona, [5]Neonatal Division, Institute of Maternal-Infantile Sciences, Polytechnic University of Marche and University of Ancona, Ancona, Italy

Background: Whether congenital diaphragmatic hernia (CDH) is associated with surfactant deficiency or dysfunction is controversial.

Aims: To measure disaturated phosphatidylcholine (DSPC) and surfactant protein B (SP-B) synthesis and metabolism in infants with CDH.

Methods: DSPC and SP-B amounts and kinetics were studied in tracheal aspirates (TA) of 12 infants with CDH (BW 2978±447g, GA 38±2 wk) and in 8 GA-matched control infants (BW 3160±350g, GA 38±2 wk). Seventeen infants received a 24h infusion of ^{13}C-leucine, an i.v. bolus of ^2H_2O and 0.0625% of fluid intake as ^2H_2O every 12h over the next 48h. Three infants received only ^{13}C-leucine infusion.