congenital anomalies, late-onset sepsis (LOS) (57.8% vs. 23.8%; OR:4.40; 95%CI:4.0–4.84) and symptomatic PDA (56.0 vs. 30.6%; OR:2.9; 95%CI:(2.6–3.2)). After adjusting for all BPD predictive perinatal risk factors (BW, GA, Apgar scores, gender and congenital anomalies (AUC:0.8, 95%CI:0.79–0.81), the factors strongly associated with BPD, other than BW and GA, were LOS (OR:2.54; 95% CI:2.27–2.83) and symptomatic PDA (OR:1.54; 95%CI:1.38–1.73).

Conclusion In this large cohort of VLBW/VLGA, the rate of BPD was 16% (15.4–16.1%), strongly associated with GA and BW but also with LOS and symptomatic PDA.

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596 EARLY PREDICTION OF BRONCHOPULMONARY DYSPLASIA (BPD) BY AN EASILY AVAILABLE RISK SCORE

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Background Early prediction of BPD is important for identifying high risk patients likely to benefit from preventive treatment approaches and for providing prognostic information. Therefore we aimed to develop a risk score for BPD based on early available clinical parameters.

Patients and methods: All infants born at the University Hospital of Lausanne < 32 weeks of gestation (WG) between 1998 and 2007 (n=936) were included. Patients diagnosed with RDS (n=232) were divided in two groups, either developing BPD or not. Independent risk factors for the development of BPD were searched by multivariate logistic regression analysis. The β-coefficients (β=log(OR)) derived from the fitted multivariate model were used to build a scoring system. An internal validation was performed using a two-fold cross-validation technique with two subgroups: two thirds of the patients were used as training set for model calibration and one third as prediction set.

Results BPD-risk score was developed based on five covariates: intubation in the delivery room, early neonatal infection, duration of invasive mechanical ventilation in days, birth weight and gestational age, weighted according their β-coefficients. Area under curve (AUC) was 0.896. Sensitivity and specificity reached 82.7% and 82.6% with a score cut-off of –8 (range –25 to +17). Internal calibration proved a good prediction: AUC for the same cut-off was 0.882 for the training set and 0.927 for the prediction set.

Conclusions A simple scoring system available within the first postnatal week can reliably predict the probability of developing BPD in infants born < 32 WG.

597 VALPROIC ACID-MEDIATED PROTECTION AGAINST HYPEROXIC LUNG INJURY VIA HISTONE DEACETYLASE INHIBITION IN A NEONATAL RAT MODEL

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Epigenetic mechanisms might play an important role in development of BPD. The aim of this study was to evaluate the protective effect of valproic acid (VPA), an histon deacetylase inhibitor, in hyperoxic lung injury in neonatal rat model.

Methods A total of 30 rat pups (0 days old) were divided equally into 3 groups: control, hyperoxia and hyperoxia+VPA groups. In hyperoxia groups, pups were maintained in 95% O_2 for 10 days while control group was maintained in room air. VPA was administered intraperitoneally once daily for the first 10 days of life. On day 10, histopathological score, radial alveolar count, lamellar protein count, histone deacetylase activity (HDAC), proinflammatory cytokine concentrations were determined with ELISA, whereas acetylated H4 protein and caspase-3 expression were evaluated with Western-Blot analysis. Also apoptosis was evaluated with TUNEL method.

Results The histopathological score, radial alveolar count, lamellar protein count of the pups in VA group were significantly higher. VPA also preserved alveolarization significantly and fibrosis was significantly decreased in rat pups exposed to VPA treatment. HDAC activity significantly reduced with VPA treatment. The proinflammatory markers, caspase-3 expression and number of TUNEL positive cells were also significantly decreased with VPA treatment. Acetylated H4 protein expression was significantly higher in the hyperoxia+VPA group.

Conclusion All these data suggest that VPA might provide possible protective effect against hyperoxic lung injury as an histone deacetylase inhibitor. VPA exhibit these effects by preserving alveolarization, decreasing fibrosis and inflammation via decreasing HDAC activity, increasing acetylated H4 protein expression and reducing inflammation.

598 EFFECTS OF CATALYTIC ANTIOXIDANT MNTBAP ON PULMONARY ANGIOGENIC AND OXIDATIVE GENE EXPRESSION TO HYPEROXIA IN NEWBORN MICE

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Background Development of lung injury during prolonged O_2 exposure is a complex process, associated with changes in expression of a number of genes important in the adaptive response to hyperoxia. MnTBAP is a compound with strong antioxidant properties.

Objective To study the effects of MnTBAP on angiogenic and oxidative gene expression in C57BL6 neonatal mice following hyperoxia.

Design and methods: Newborn mice litters were randomized on postnatal day 4 to hyperoxia (> 95% O_2)(OX) or room air (RA) for 72 hrs during which they received MnTBAP (MN) 10mg/kg or saline (SL) daily by IP injection for 3 days and then were sacrificed. Whole lung angiogenic and oxidative gene expression profiling (84 related genes for each) was done by real-time, reverse transcription, quantitative PCR (n=4). Data was processed and analyzed using SA Biosciences PCR array data analysis web portal.

Results Hyperoxia significantly upregulated peroxiredoxin 6 expression compared to room air exposed newborn mice. Treatment with MnTBAP downregulated the expression of myeloperoxidase and Prdx6-rs1. Hyperoxia downregulated the expression of angiogenic genes such as angiopoietin 1 & 2, TGF 1, TGF 3 and HGF; MnTBAP treatment during the hyperoxia exposure reversed this effect and these genes were upregulated.

Conclusions The catalytic antioxidant MnTBAP reversed the effects of hyperoxia on angiogenic gene expression in newborn mice. The protective effects of antioxidants in newborn hyperoxia models need to be studied further to provide additional understanding of the management of bronchopulmonary dysplasia.

599 CARDIOVASCULAR CONSEQUENCES OF BRONCHOPULMONARY DYSPLASIA IN PREMATURELY BORN PRESCHOOL CHILDREN

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Backgroud and aims: Bronchopulmonary dysplasia (BPD) is one of the most important chronic complications of premature birth. Although long term effects of BPD are more commonly known by the well-defined pulmonary consequences, cardiovascular sequelae related to BPD have also been reported. In the post-surfactant era data on the cardiovascular changes in new BPD patients is limited. In this study we aimed to investigate the role of myocardial tissue Doppler echocardiography in detecting cardiac pathology in preschool BPD patients and to find out possible risk factors related to cardiovascular sequela.

Methods Prematurely born children with BPD (N=21, 4 severe BPD, 3 moderate BPD and 14 mild BPD) and without BPD (N=20) at 2 to 4 years of age were enrolled to the study. Conventional and myocardial tissue Doppler echocardiography studies were performed.

Results In conventional echocardiography; right ventricular fractional shortening, tricuspid E/A ratio, mitral late diastolic inflow velocity and pulmonary acceleration time were decreased; mitral E/A ratio, left and right ventricular myocardial performance indexes were increased in BPD group compared to controls. In myocardial tissue Doppler measurements; tricuspid annulus E'/A'ratio was decreased and interventricular septum systolic velocity was increased in BPD group. Low birth weight, disease severity and postnatal cumulative steroid dosage were related with echocardiographic changes.

Conclusion BPD affects global cardiac performances up to 2 to 4 year of age with regard to birth weight, disease severity and cumulative steroid dosage. Myocardial tissue Doppler examination did not have additional value to conventional echocardiography in demonstration of these changes.

600 EVALUATION OF INFLAMATION IN BRONCHOPULMONARY DISEASE WITH TRANSCUTANEOUS CARBOXIHEMOGLOBIN MEASUREMENT- PRELIMINARY RESULTS

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Background and Aims Bronchopulmonary dysplasia (BPD) is an important chronic respiratory morbidity of premature infants. Increased carboxyhemoglobin (COHb) levels have been reported for chronic obstructive pulmonary disease, systemic inflammatory response syndrome and acute respiratory distress syndrome and also for mortality in premature infants. COHb levels increases as a result of oxidative stress and inflammation. Changes of COHb levels by the measurement of transcutaneous COHb levels may be informative for continuing inflammation levels of BPD. We aimed to evaluate inflammatory process in BPD with transcutaneous COHb.

Methods Twenty premature infants discharged from Ege University NICU with the diagnosis of BPD (Group 1), 20 premature infant without BPD (Group 2), 20 term healthy control (Group 3) infant were included in the study. Transcutanous COHb levels were measured with Masimo radical set device following three months after discharge. Antenatal and neonatal characteristics of infants were recorded.

Results Mean transcutanous COHb levels were significantly higher in group 1 than group 2 (p=0.000) at postnatal age 0. Mean SpCO values after first three months of discharge were higher in group 1 than group 2 (p<0.05) and group 3 (p<0.001). No difference was detected in the same groups' (Group 1 and 2) consequent measurements of SpCO.

Conclusion Our data support the ongoing persistant chronic inflamatory process after discharge in infants with BPD. The long term multisystemic morbidity, inflammatory mass could be minimized with early diagnosis and preventive treatments. Further investigations are needed in larger populations for early prediction of BPD among the risk group.

601 DOES BRONCHOPULMONARY DYSPLASIA RELATE TO REDOX STATUS IN INFANTS LESS THAN 29 WEEKS OF GESTATIONAL AGE?

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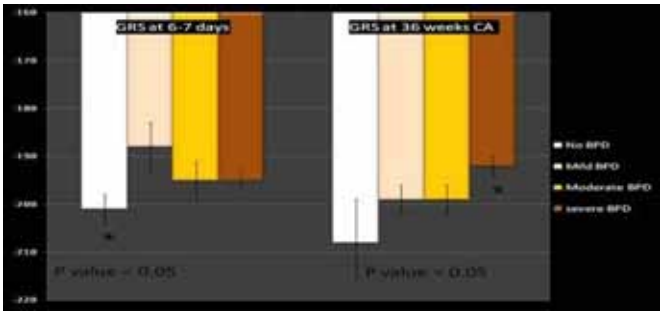
Background Glutathione is the key molecule in detoxification of peroxides leading to an oxidized glutathione redox status (GRS). We hypothesizes that GRS plays an important role in the etiology of bronchopulmonary dysplasia (BPD).

Objective To test the relation between GRS at 6–7 days of life as well as at 36 weeks of corrected age and BPD. To identifty perinatal factors affecting GRS.

Design/methods Whole blood GRS was measured at 6–7 days of life and at 36 weeks of corrected age (CA) in 51 infants less than 29 weeks of gestational age (GA). Perinatal clinical data that may affect the GRS were colleted. The GRS was calcualted using concentration of GSH and GSSG according to the Nernst equation (Schafer & Buettner, 2001).

Results Infants in our cohort had gestational age of 26±1 weeks with birth weight of 847±166 gm. Significant relation between GRS and BPD was confirmed with less risk of BPD in infants with most reduced GRS (day 6–7) and higher risk of BPD for infants with most oxidized GRS at 36 weeks CA.



Abstract 601 Figure 1 Relation between GRS and BPD

GA and BW were signifcantly related to GRS.

Abstract 601 Table 1 Different perinatal factors effect on GSR

	Test used	P value for GRS at 6–7 days	P value at 36 CA
Gestational age	Pearson correlation	0.01	0.08
Birth weight	Pearson correlation	0.04	0.93
Sex	T-test	0.47	0.89
Maternal preeclampsia	T-test	0.37	0.35
Chorioamnionitis	T-test	0.15	0.98
Small for gestational age	T-test	0.8	0.77

Conclusions There is a significant relation between GRS 6–7 days of life as well as at 36 weeks CA and BPD outcome in infants less than 29 weeks of GA. The significant impact of both GA and BW on GRS at 6–7 days of life is explained by the glutathione level that is correlated with gestational age.