Study Selection Criteria: Cohort and case-control studies from 2000 onwards: Four reviewers independently assessed eligibility.
Data Extraction and analysis: The outcome measure was 'all stages of ROP'. Quality assessment of studies was done using Newcastle-Ottawa scale. A random effects meta-analysis model was used and heterogeneity was assessed using I^2 statistic.
Results Nine studies met the final selection criteria. Total sample size was 2106 preterm infants with median gestational age 30 weeks and birth weight 1228 grams. Blood transfusion was associated with the development of ROP; unadjusted odds ratio (OR) = 3.05 (95% CI 2.16 to 4.32) with a significant heterogeneity (I^2 = 54.8% p = 0.02). The unadjusted pooled OR in three of these studies was 2.59 (95% CI 1.35 to 4.98) and the adjusted pooled OR was 1.18 (95% CI 0.96 to 1.33), I^2 = 8.8%.
Conclusion Blood transfusion was associated with the development of ROP in preterm infants. However once other factors such as gestational age and birth weight were adjusted for, the association between blood transfusion and ROP development was considerably weaker.

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PS-201a HYPERBILIRUBINEMIA AND PHOTOTHERAPY IN NEWBORNS AFFECT CARDIOVASCULAR AUTONOMIC CONTROL

[1]M Javorka, [2]Z Uhrikova, [2]M Zibolen, [1]L Chladekova, [1]K Javorka. *[1]Department of Physiology, Comenius University Jessenius Faculty of Medicine, Martin, Slovakia; [2]Clinic of Neonatology, Comenius University Jessenius Faculty of Medicine and University Hospital, Martin, Slovakia*

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Background Neonatal jaundice and its phototherapeutic treatment can lead to side effects involving activation of autonomic control mechanisms.
Aim To investigate the autonomic nervous system changes in icteric neonates using heart rate variability (HRV) and to assess the effect of phototherapy on HRV as an indicator of autonomic nervous control of cardiovascular system.
Methods HRV recordings of 20 icteric full-term neonates before, during and after the phototherapy and of 20 healthy controls were analysed. Besides traditional time and frequency domain measures, HRV complexity parameters including normalised complexity index (NCI), normalised unpredictability index (NUPI), pattern classification (0V%, 1V%, 2LV%, 2UV%) and multiscale irreversibility indices (P%, G%, E) were evaluated. All measures were derived from data segments of 1000 RR intervals.
Results The analysis revealed higher values of 1V% and 2LV%, lower P% and reduced percentage of irreversible HRV recordings in the group of neonates with hyperbilirubinemia. While mean heart rate was increased during and after the phototherapy, HRV magnitude was not changed. Nonlinear analysis showed a decrease of complexity, unpredictability and pattern classification measures 2LV% and 2UV%. In contrast, 0V%, P% and the percentage of irreversible recordings were increased during and after the phototherapy.
Conclusion The results suggest a shifted autonomic balance in icteric neonates compared to the controls and its further alterations during phototherapy. As the nonlinear HRV parameters are independent of the linear methods, they can provide new information about the cardiac regulatory mechanisms and their changes in neonates.

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PS-201b THE OUTCOME OF TREATMENT LIMITATION DISCUSSIONS IN NEWBORNS WITH BRAIN INJURY

[1]D Wilkinson, [2]M Brecht. *[1]Oxford Uehiro Centre for Practical Ethics, University of Oxford, Oxford, UK; [2]Neonatal Department, Women's and Children's Hospital, Adelaide, Australia*

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Background Most deaths in severely brain-injured newborns in neonatal intensive care units (NICU) follow discussions and explicit decisions to limit life-sustaining treatment. There is little published information on such discussions.
Objective To describe the prevalence, nature and outcome of treatment limitation discussions (TLD) in critically ill newborns with severe brain injury.
Design A retrospective statewide cohort study.
Setting Two tertiary NICUs in South Australia.
Patients Ventilated newborns with severe hypoxic ischaemic encephalopathy and peri-/intraventricular haemorrhage (P/IVH) admitted over a 6-year period from 2001–6.
Main outcome measures Short-term outcome (until hospital discharge) including presence and content of TLDs, early childhood mortality, school-age functional outcome.
Results We identified 145 infants with severe brain injury; 78/145 (54%) infants had documented TLDs. Fifty-six infants (39%) died prior to discharge, all following treatment limitation. The majority of deaths (41/56; 73%) occurred in physiologically stable infants. Twenty-two of 78 (28%) infants with at least one documented TLD survived to discharge, most in the setting of explicit or inferred decisions to continue treatment. The majority of long-term survivors after TLD (8/15, 53%) were severely impaired at follow-up. Two thirds of surviving infants with TLD in the setting of unilateral P/IVH had mild or no disability.
Conclusions and relvance Some critically ill newborn infants with brain injury survive following TLDs between their parents and physicians. Outcome in this group of infants provides valuable information about the integrity of prognostication in NICU, and should be incorporated into counselling.

Neonatal Lung Injury

PS-202 INFLUENCE OF MODERATE PERMISSIVE HYPERCAPNIA ON PULMONAL INFLAMMATION IN EXTREMELY LOW BIRTHWEIGHT INFANTS (ELBWI)

[1]S Gentner, [2]U Uhlig, [3]HD Hummler, [4]UH Thome. *[1]Department of Cardiac Thoracic and Vascular Surgery, University Hospital Ulm, Ulm, Germany; [2]Department of Pharmacology and Toxicology, RWTH Aachen University, Aachen, Germany; [3]Department of Pediatrics, Children's Hospital University of Ulm, Ulm, Germany; [4]Department of Neonatology, University of Leipzig, Leipzig, Germany*

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Background and aims We tested the hypothesis that moderate permissive hypercapnia (PHC) results in less lung injury than mild hypercapnia (MHC) and therefore may reduce the concentration of proinflammatory cytokines and acid sphingomyelinase (ASMase) in tracheal aspirates.
Methods Preterm infants (birthweight 400–1000 g, gestational age 23 0/7–28 6/7 weeks) requiring mechanical ventilation within the first 24 h after birth, were randomised to receive either PHC ($PaCO_2$ target area starting with 55–65 mm Hg at day 1 to 65–75 mm Hg at day 7) or MHC ($PaCO_2$ target area starting with 40–50 mm Hg at day 1 to 50–60 mm Hg at day 7). Tracheal aspirates were collected and analysed for IL-1β, IL-6, IL-8, IL-10, MIP-1α, LTB_4, TGF-β_1, NPY, albumin, nitrate, ASMase and the secretory component for IgA. The primary endpoint BPD or death was determined at a postmenstrual age of 36 weeks ± 1 day.
Results 71 infants were enrolled, 35 received PHC and 36 MHC. Analyses of variance for the main effect of the $PaCO_2$ targets did not detect significant differences: IL-1β (p = 0,42), IL-6 (p = 0,44), IL-8 (p = 0,91), IL-10 (p = 0,87), MIP-1α (p = 0,34), LTB_4 (p = 0,87), TGF-β_1 (p = 0,26), NPY (p = 0,47), albumin (p = 0,63), nitrate (p = 0,73), ASMase (p = 0,25). BPD or death occured in 9 (26%) and in 10 (28%) of infants receiving PHC or MHC.
Conclusion PHC did not result in lower inflammatory activity than MHC in ventilated ELBWI.

PS-203 PRE- AND POST-NCPAP VENTILATION PLASMA CYTOKINE LEVELS IN PRETERM NEWBORN INFANTS WITH EARLY RESPIRATORY DISTRESS

[1]CG Carvalho, [1]RS Procianoy, [2]EC Neto, [1]RC Silveira. *[1]Neonatology, HCPA-UFRGS, Porto Alegre - Brazil, Brazil; [2]Neonatology, Laboratorio Nobel, Porto Alegre - Brazil, Brazil*

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Introduction Mechanical ventilation (MV) induces expression of pro-inflammatory cytokines. Early nasal continuous positive airway pressure (nCPAP) seems to prevent ventilator-induced lung injury – and these effects have not been studied in humans.
Objective To evaluate plasma levels IL-1β, IL-6, IL-8, IL-10, and TNF-α immediately before the start of nCPAP and 2h later.
Methods Prospective cohort including preterm newborns with gestational age of 28–35 weeks admitted to a NICU for respiratory support. Newborns with malformations, congenital infections, sepsis, surfactant treatment, and receiving ventilatory support in the delivery room were excluded. Blood samples were collected right before and 2 h after the start of ventilation. Wilcoxon test was used for comparisons.
Results 23 preterm (mean weight 1850.65 ± 403g; GA 32,36 ± 1,74 weeks) were treated with nCPAP. A significant decrease in IL-6 levels was observed after 2 h of nCPAP. Of 15 newborns whose mothers received antenatal steroid, cytokine level was lower at the onset of nCPAP in all patients compared to those whose mothers didn't receive the treatment, but this effect was not sustained after 2 h.
Conclusion nCPAP was associated with minimal release of pro-inflammatory cytokines and seems to play a less harmful role, which was enhanced by the use of antenatal steroids. As MV usually promotes a significant inflammatory response, the use of nCPAP as initial protective respiratory strategy for preterm with moderate respiratory distress should be supported.

PS-204 THE UTILITY OF N-TERMINAL PRO-BRAIN NATRIURETIC PEPTIDE IN ASSESSMENT OF RESPIRATORY DISTRESS IN TERM NEONATES

[1]G Markovic-Sovtic, [2]J Kosutic, [1]B Jankovic, [3]A Sovtic, [4]D Bojanin, [1]Z Rakonjac. *[1]Department of Neonatology, Mother and Child Health Care Institute, Belgrade, Serbia; [2]Department of Cardiology, Mother and Child Health Care Institute, Belgrade, Serbia; [3]Department of Pulmonology, Mother and Child Health Care Institute, Belgrade, Serbia; [4]Department of Laboratory Diagnostics, Mother and Child Health Care Institute, Belgrade, Serbia*

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Background and aims The N-terminal pro-brain natriuretic peptide (NTpro-BNP) is used to differentiate congestive heart failure and lung disease in children and adults. The aim of our study was to determine its utility in the assessment of respiratory distress (RD) in term neonates. We sought to find out whether it can distinguish cardiac from pulmonary aetiology of respiratory distress in term neonates.
Methods The NT pro-BNP level was determined in 60 neonates admitted for RD. They were further divided in two subgroups: 37 with congenital heart disease (CHD) and 23 with pulmonary disease. The control group consisted of 30 neonates with no signs of RD. Findings of auscultation, chest radiography, Silverman score and echocardiography were recorded for each patient. Blood samples for determining NT pro-BNP levels were obtained on admission, when blood sampling was indicated for the clinical management of the newborn.
Results The RD group, regardless of aetiology, showed significantly higher levels of NT- pro BNP than the control group ($p < 0.001$). Neonates with more severe RD had significantly higher level of NT-pro BNP ($p = 0.002$). No significant difference was found between neonates with RD due to CHD and those with RD due to pulmonary disease.
Conclusions Term neonates with RD have significantly higher NT-pro BNP levels than healthy neonates. Higher level of NTpro-BNP indicates more severe RD. A single measurement of NT pro-BNP leve lcannot be used as the sole biomarker for distinguishing between cardiogenic and noncardiogenic aetiology of RD in term neonates.

PS-205 INHALED NITRIC OXIDE INCREASES URINARY NITRIC OXIDE METABOLITES AND CGMP IN PREMATURE INFANTS: RELATIONSHIP TO PULMONARY OUTCOME

[1]PL Ballard, [1]RL Keller, [2]DM Black, [3]DJ Durand, [3]JD Merrill, [4]EC Eichenwald, [5]WE Truog, [6]MC Mammel, [7]R Steinhorn, [8]R Ryan, [9]SE Courtney, [1]RA Ballard. *[1]Pediatrics, University of California San Francisco, San Francisco, USA; [2]Epidemiology and Biostatistics, University of California San Francisco, San Francisco, USA; [3]Pediatrics, Children's Hospital and Research Center, Oakland, USA; [4]Pediatrics, University of Texas Medical School Houston, Houston, USA; [5]Pediatrics, University of Missouri-Kansas City School of Medicine, Kansas City, USA; [6]Pediatrics, Children's Hospital and Clinics of Minnesota, St. Paul, USA; [7]Pediatrics, University of California Davis Children's Hospital, Sacramento, USA; [8]Pediatrics, Medical University of South Carolina, Charleston, USA; [9]Pediatrics, University of Arkansas for Medical Sciences, Little Rock, USA*

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Background/aims Inhaled NO (iNO) has been tested for prevention of bronchopulmonary dysplasia in premature infants, however the role of cGMP is not known. We hypothesised that levels of NO metabolites (NOx) and cGMP in urine, as a non-invasive source for biospecimen collection, would reflect the dose of iNO and relate to pulmonary outcome.