six months of age with placebo or the probiotic strains *Lactobacillus rhamnosus* GG, *Lactobacillus rhamnosus* LC705, *Bifidobacterium breve* Bbi99 and *Propionibacterium freudenreichii* ssp. *Shermani* JS. 177 of the families completed questionnaires addressing allergy development until two years of age.

Results: The cumulative incidence of eczema was not significantly different in the probiotic (21.7%) and the placebo group (14.1%). Children receiving probiotics, as compared with placebo, had a lower cumulative incidence of wheeze, 34.1% versus 49.4% ($p=0.04$). Children attending day-care had a lower cumulative incidence of eczema ($p=0.03$). Recurrent wheeze was associated with treatment with antibiotics ($p=0.005$) and care in the neonatal ward ($p=0.02$).

Conclusion: Postnatal probiotic supplementation did not affect the development of infant eczema in children with genetic risk for diabetes, but showed association with a lower incidence of wheeze. Allergy development was associated with environmental factors potentially modulating microbial load.

92

IMPAIRED CEREBRAL AUTOREGULATION IS ASSOCIATED WITH INCREASED BLOOD PRESSURE VARIABILITY IN PRETERM INFANTS

R. Silas^{1,2}, S. Hew¹, A.M. Walker¹, F. Wong^{1,2,3}

¹The Ritchie Centre, Monash University, ²Monash Newborn, Monash Medical Centre, ³Department of Paediatrics, Monash University, Melbourne, VIC, Australia

Background: Impaired cerebral autoregulation is a key pathogenic factor in preterm cerebral injury, but the association of blood pressure variability (BPV) with autoregulatory impairment is unknown. We hypothesized that increased BPV in sick preterm infants leads to cerebral autoregulatory impairment. Using spectral analysis, we aimed to determine autoregulatory capacity in the early postnatal period, assessed by the correlation between mean arterial blood pressure (MABP, mmHg) and cerebral oxygenation (tissue oxygenation index, TOI %), and its relation with BPV(mmHg²)

Method: Twenty-seven preterm infants of mean gestational age of 26.3 (± 1.3) weeks were studied on the first 3 postnatal days. TOI was continuously measured by Spatially Resolved Spectroscopy

(Hamamatsu NIRO 200) together with MABP from an arterial catheter. Spectral coherence analysis was used to assess concordance between MABP and TOI, expressed as Coherence score (Coh) with a value of >0.5 suggesting impaired autoregulation. BPV was assessed using power spectral density of MABP.

Results: In the frequency range 0.003-0.02Hz, BPV and maximum Coh showed a significant correlation ($p=0.03$). The median (IQR) minimum BPV associated with Coh >0.5 was lower in the very sick infants with Clinical Risk Index for Babies (CRIB) score of >7 , compared with infants with CRIB score < 7 [29.7 (24.7-76.9) vs 99.7 (79.6 - 208.4) mmHg², $p=0.03$]

Conclusions: Cerebral autoregulatory impairment is associated with increased BPV, though this occurs with a comparatively lower level of BPV in extremely sick preterm infants. Our findings suggest that the sickest preterm infants are more vulnerable to cerebral injury from BPV.

93

CYTOKINES ASSOCIATE WITH TISSUE FACTOR BUT NOT WITH THROMBIN FORMATION IN PRETERM INFANTS

A. Palojarvi, J. Petäjä, C. Janér, S. Andersson

Children's Hospital, Helsinki University Hospital, Helsinki, Finland

Background: Tissue factor (TF), the in vivo initiator of coagulation cascade, is a central link between inflammatory and coagulation pathways.

Objective: To evaluate associations between cytokine concentrations, TF and thrombin formation in preterm infants.

Methods: We measured proinflammatory cytokines (IL-6, IL-8, TNF-alpha), anti-inflammatory cytokine IL-10, free TF and, as indicator of thrombin generation, prothrombin fragment 1+2 (F1+2) in 56 VLBW infants (GA 23+5-31+5 wks, BW 600-1500g). Cord blood and blood samples on day 1, 3, and 5-7 were collected. From plasma cytokines were analyzed with Luminex technique, free TF and F1+2 were analyzed with Elisa tests (American Diagnostica, Dade Behring).

Results: IL-6 correlated with free TF in cord samples and on days 1 and 3 ($R=0.53$, $p=0.013$, $n=21$; $R=0.380$, $p=0.019$, $n=38$; $R=0.373$, $p=0.042$, $n=30$). IL-8 correlated with free TF on days 1 and

3 ($R=0.597$, $p<0.001$, $n=38$; $R=0.462$, $p=0.009$, $n=31$). TNF-alpha and IL-10 both correlated with free TF in cord samples ($R=0.536$, $p=0.012$, $n=31$, and $R=0.610$, $p=0.003$, $n=22$). No correlations were found between cytokines and F1+2.

Conclusions: Both pro- and anti-inflammatory cytokines correlated with high TF concentration. A difference seems to exist between in utero (cord) and postnatal TF regulation: in cord plasma TNF-alpha as well as IL-10 showed strong associations with TF but lost this role to IL-8 postnatally. Free TF failed to contribute to the rate of thrombin generation. This shift of TF from coagulation to inflammation may have effects on pathogenesis of lung injury, as well as on extrapulmonary morbidity in preterm infants.

94

ROUTINE COAGULATION SCREENING IN NICU- TO DO OR NOT TO DO? REVIEW OF 2 U.K TERTIARY NEONATAL UNITS

P. Muthukumar¹, K. Catford¹, V. Venkatesh¹, S. Reddy¹, A. Curley¹, P. Clarke²

¹Neonatal Unit, Cambridge University Hospital NHS Foundation Trust, Cambridge, ²Neonatal Unit, Norfolk & Norwich University Hospitals NHS Trust, Norwich, UK

Introduction: Routine coagulation screening of neonates admitted for intensive care is common. There is little evidence of efficacy of fresh frozen plasma (FFP) in the treatment of isolated abnormal coagulation values.

Objective: To compare transfusion rates of FFP between 2 tertiary neonatal units with similar admission rates one using routine (NICU1) and other targeted coagulopathy screening (NICU2). Secondary objective was to assess the proportions of cases treated in each unit with FFP whose coagulation parameters reverted to the normal range.

Methods: Retrospective review of neonates receiving FFP from Jan 2003- March 2008 in two UK tertiary-level neonatal units

Results: 164 neonates received 268 FFP transfusions. 131/164 (80%) infants in NiCU1 compared with 33/164 (20%) in NICU2 received FFP. Predominant reason for transfusion was abnormal laboratory measures of coagulation (77% in NICU1 and 47% in NICU 2). Active bleeding

only accounted for 15% of transfusions. Pre and post transfusion coagulation studies (within 24 hours) were measured in 72%. In only 15% did administration of FFP corrected laboratory parameters to the normal range for gestational age, in more than half of instances this occurred with diagnosis of isolated abnormal coagulation values. There was no significant difference in the proportion of babies with corrected values post FFP between two units.

Conclusion: Routine coagulopathy screening may increase the number of FFP transfusions. FFP administration did not correct laboratory parameters in majority of transfusions. The risks of transfusions should be balanced against limited clinical evidence for its administration in isolated coagulopathy.

95

HIGH COPEPTIN (ARGININE-VASOPRESSIN) CONCENTRATIONS IN UMBILICAL CORD BLOOD AFTER VAGINAL DELIVERY AND BIRTH ACIDOSIS

S. Wellmann¹, J. Benzing², G. Cippa¹, D. Admaty¹, R. Creutzfeldt¹, E. Beinder³, G. Szinnai⁴, O. Lapaire⁵, N.G. Morgenthaler⁶, U. Haagen⁶, C. Bühner⁷, H.U. Bucher¹

¹Department of Neonatology, University Hospital Zürich, Zürich, ²Department of Neonatology, University Children's Hospital Basel, Basel, ³Department of Obstetrics, University Hospital Zürich, Zürich, ⁴Pediatric Endocrinology, University Children's Hospital Basel, ⁵Devision of Obstetrics and Gynecology, University Hospital Basel, Basel, Switzerland, ⁶Research Department, B.R.A.H.M.S. AG, Hennigsdorf, ⁷Department of Neonatology, Charité University Medical Center, Berlin, Germany

Background: The pituitary-secreted nonapeptide Arginine-Vasopressin (AVP) is unstable and therefore unsuited for diagnostic use but its secretion can be gauged by measuring copeptin, the C-terminal portion of the AVP precursor (CT-proAVP). We determined copeptin in umbilical cord blood and at 3 days of age in order to establish normal values and perinatal factors affecting copeptin concentrations.

Methods: Paired arterial/venous umbilical cord samples were obtained from 117 infants and umbilical venous-only samples from additional 46 infants. In 102 infants, blood was also obtained at 3 days of life. Copeptin levels were determined using the CT-proAVP-Luminescence-immunoassay.