

less mature than those without chorioamnionitis (mean age at birth 27wks v 29wks, mean dif. -2.2, $p<0.001$). After adjustment for gestation chorioamnionitis was not associated with respiratory sequele.

Conclusion In our population of VLBW infants treated with antenatal corticosteroids histological chorioamnionitis is not associated with adverse respiratory status. The most significant predictor of respiratory progress is gestational age.

408 AEROSOLIZED SURFACTANT IMPROVES LUNG MECHANICS AND REDUCES LUNG INJURY IN PREMATURE LAMBS WITH RESPIRATORY DISTRESS SYNDROME

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¹C ReySantano, ¹VE Mielgo, ¹E Ruiz-del-Yerro, ²L Andres, ³A Vallsi-Soler, ¹X Murgia. ¹Respiratory Physiology Research Unit; ²Pathology, University Cruces Hospital; ³Neonatal Intensive Care Unit, Cruces Hospital, Barakaldo, Spain

Background Aerosolization of surfactant(SF) has emerged as feasible alternative to instillation for RDS.

Aim To determinate the effects of aerosolized SF on lung function and evaluate changes in the biochemistry and histology of premature lung.

Methods 21 preterm lambs (85%gestation) were randomly assigned to receive aerosolized SF (Curosurf®, 200mg/kg-20min), delivered via an inhalation catheter (SF-Aero), bolus-SF (SF-Bolus) or Control groups maintained during 6hours in IMV. Lung mechanics [compliance(C_{dyn}) and tidal-volume(V_T)], antioxidant enzyme (catalase; superoxide-dismutase, SOD; glutathion-peroxidase, GSH-Px) activity, surfactant proteins (SP-B, SP-C) concentration and histological analysis were performed. Mean \pm SD, ANOVA, $p<0.05$. *vs. Control, #vs.SF-bolus group.

Results After 60min of treatment, animals in SF-Aero and SF-Bolus groups, significantly improved C_{dyn} and V_T in comparison to control group, being improvement persistent until the end of the experiment.

Abstract 408 Table 1 Biochemical lung analysis

	CONTROL	SF-BOLUS	SF-AERO
Catalase (U/ugDNA)	6 \pm 1	9 \pm 2*	8 \pm 5
SOD (U/ugDNA)	10 \pm 5	14 \pm 11	9 \pm 5
GSH-PX (U/ugDNA)	0.02 \pm 0.01	0.03 \pm 0.01	0.04 \pm 0.01
IL-8 (pg/mgproteine)	18.7 \pm 5.2	11.1 \pm 6.5	11.3 \pm 3.1*
SP-B (ng/mgproteine)	3.0 \pm 0.6	3.7 \pm 0.9	3.4 \pm 0.6
SP-C (ng/mgproteine)	10.4 \pm 4.1	12.7 \pm 4.8	15.9 \pm 4.2*

Conclusion Surfactant delivered as an aerosol produce a similar response in terms of pulmonary mechanics to bolus instillation, and result in less lung damage.

409 PREDICTIVE VALUE OF THE BAYLEY SCALES OF INFANT DEVELOPMENT ON DEVELOPMENT OF VERY PRETERM/VERY LOW BIRTH WEIGHT CHILDREN: A META-ANALYSIS

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Abstract 408 Table 2 Lung injury score

	Atelectasis	Necrosis	Edema	Alveolar inflammation	Interstitial inflammation	Alveolar hemorrhage	Interstitial hemorrhage	TOTAL
Control	1.7(1-3)	0	0	1.73(0-3)	1.14(0-2)	0.77(0-2)	0.95(0-1)	6.25(4-9)
SF-BOLUS	1.0(0-3)*	0	0	1.19(0-3)	1.06(0-2)	1.63(0-3)*	1.13(0-2)	5.93(2-11)
SF-AERO	0.67(0-2)*	0	0	0.62(0-2)*#	0.75(0-2)*	1.04(0-2)#	1.0(0-2)	4.0(1-7)*#

¹ES Luttkhuizen dos Santos, ²JF de Kieviet, ²M Königs, ^{1,3}RM van Elburg, ²J Oosterlaan. ¹Paediatrics, VU University Medical Center; ²Clinical Neuropsychology, VU University, Amsterdam; ³Danone Research Centre for Specialized Nutrition, Wageningen, The Netherlands

Background and Aims The Bayley Scales of Infant Development (BSID) is the most widely used measure to assess neurodevelopment of very preterm (gestational age ≤ 32 weeks) and very low birth weight (VLBW, ≤ 1500 grams) infants in the first three years of life. This meta-analysis determines the predictive value of the mental subscale (MDI) and motor subscale (PDI) of the BSID for later (≥ 36 months) motor and cognitive development in very preterm/VLBW children.

Methods PubMed, PsychINFO and CINAHL were searched for English-language peer-reviewed studies published before April 2012. Studies were included if they reported odds ratios or correlations between the MDI/PDI scores obtained in the first three years of life, and standardized intelligence or motor assessment in childhood (≥ 36 months of age). Meta-analytic methods were applied to aggregate available data.

Results A total of 16 studies met inclusion criteria. Across 15 studies encompassing 1335 very preterm/VLBW children, MDI scores were strongly predictive for later cognitive development, $r=0.61$ (95%CI: 0.57-0.64), $p<0.001$. The relationship between MDI scores and later cognitive development was not mediated by birth weight ($p=0.56$), gestational age ($p=.70$), and time interval between assessments ($p=0.55$). Across four studies including 465 very preterm/VLBW children, PDI scores were moderately predictive for later motor function, $r=0.32$ (95%CI: 0.22-0.40), $p<0.001$.

Conclusions In very preterm/VLBW children, MDI scores explain 37% of the variance in later cognitive functioning, whereas PDI scores explain 10% of later motor development. Thus a large proportion of the variance remains unexplained, underlining the importance of enhancing prediction of developmental outcomes.

410 PERINATAL INFECTION AND NEURODEVELOPMENTAL OUTCOME IN VERY PRETERM AND VERY LOW BIRTHWEIGHT INFANTS: A META-ANALYSIS

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¹EOG van Vliet, ²JF de Kieviet, ²J Oosterlaan, ^{1,3}RM van Elburg. ¹Neonatology, VU University Medical Center; ²Clinical Neuropsychology, VU University Amsterdam, Amsterdam; ³Danone Research Center for Specialised Nutrition, Wageningen, The Netherlands

Backgrounds Very preterm birth and very low birth weight (VLBW) is associated with adverse neurodevelopmental outcome. Many very preterm/VLBW infants develop perinatal infections. This quantitative meta-analysis summarizes studies evaluating the effect of perinatal infections on neurodevelopmental outcome in this population.

Methods We searched Medline, PsychInfo, EMBASE and Web of Knowledge for studies on infections and neurodevelopmental outcome measured with Bayley Scales of Infant Development 2nd edition (BSID-II) scores in very preterm/VLBW infants. Two authors independently reviewed, rated and abstracted data from each article.

Results This meta-analysis includes 18 studies encompassing data on 13.755 very preterm/VLBW infants. Very preterm/VLBW infants with perinatal infections have poorer mental (-0.25 SD, $p<0.001$) and motor development (-0.37 SD, $p<0.001$) compared to very preterm/VLBW infants without infections. Mental development is most impaired by necrotizing enterocolitis (NEC, -0.40 SD $p<0.001$) and meningitis (-0.37 SD $p<0.001$). Motor development is most impaired by NEC (-0.66 SD $p<0.001$). Chorioamnionitis did not affect mental or motor development (-0.05 SD, $p=0.37$ and 0.19 SD, $p=0.082$).

Conclusions Postnatal infections have detrimental effects on mental and motor development in very preterm/VLBW infants. This effect adds up to the well-known detrimental effect of prematurity and highlights the importance of infection prevention in these vulnerable infants.

411 COMPARISON OF REGIONAL CEREBRAL BLOOD FLOW DISTRIBUTION AFTER AEROSOLIZED VERSUS INSTILLED SURFACTANT IN PRETERM LAMBS

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¹VE Mielgo, ¹C Rey-Santano, ¹E Ruizdel-Yerro, ²A Vallis-Soler, ¹X Murgia. ¹Research Unit; ²Neonatal Intensive Care Unit, Cruces University Hospital, Baracaldo, Spain

Background Rapid Intratracheal instillation of surfactant (SF) in preterm neonates with respiratory distress syndrome (RDS) has been associated with cerebral haemodynamic disturbances. Aerosolized surfactant might potentially avoid these disturbances through a gradual improvement of lung function.

Objective To compare carotid blood flow (CBF) and regional cerebral blood flow (RCBF) distribution in preterm lambs after treatment with instilled or aerosolized surfactant.

Methods 12 preterm lambs (133d GA) were randomized to receive instilled (SF-Bolus, $n=6$) or aerosolized (SF-Aero, $n=6$) surfactant. CBF was measured at foetal life, baseline, 5, 15 and 30 minutes after the initiation of surfactant therapy and thereafter, every 30 minutes until the end of the experiment. RCBF was determined using coloured microspheres technique at foetal life and 5, 60, 180 and 360 minutes after the start of surfactant therapy. Brain samples of striatum, thalamus and hippocampus grouped as inner zones, cortical zones and cerebellum and brain-stem (CB-B) were analyzed. ANOVA, $p<0.05$.

Results Following SF-Bolus administration a marked increase in CBF was observed for the first 30 min in comparison to SF-Aero group. 1 hour after treatment, however, both groups had similar CBF values. Immediately after SF instillation and during the ventilatory support, RCBF in inner (thalamus and hippocampus) and in CB-B zones was increased in SF-bolus group in comparison with SF-Aero group. No significant differences were detected in cortical blood flow.

Conclusion In preterm lambs with RDS, aerosolized surfactant produced a different cerebral haemodynamic pattern than did SF bolus instillation. These observations should be carefully explored (FIS10/00943).

412 COMBINATION OF GENOMIC TECHNOLOGIES AND CONSANGUINITY IN ORDER TO IDENTIFY PATHOGENIC VARIANTS IN RECESSIVE DISORDERS

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¹P Makrythanasis, ¹M Nelis, ¹FA Santoni, ²M Guipponi, ²F Béna, ¹A Vanier, ³G Duriaux-Sail, ²S Gimelli, ²E Stathaki, ¹E Falconnet, ³S Temtamy, ⁴A Megarbane, ³M Aglan, ³M Zaki, ²S Fokstuen, ²A Bottani, ⁵A Masri, ⁶S Psoni, ⁶S Kitsiou, ⁶H Frissyr, ⁶E Kanavakis, ⁷N Ali-Allawi, ⁸A Sefiani, ⁹S Al-Hait, ⁸S Elalaoui, ⁴N Jalkh, ^{10,11}L Al-Gazali, ^{10,11}F Al-Jasmi, ¹²H Chaabouni Bouhamed, ¹H Hamamy, ^{1,2}SE Antonarakis. ¹Department of Genetic Medicine and Development, University of Geneva; ²Service of Genetic Medicine, University Hospitals of Geneva, Geneva, Switzerland; ³Department of Clinical Genetics, National

Research Centre Cairo, Cairo, Egypt; ⁴Medical Genetics Unit, Saint Joseph University, Beirut, Lebanon; ⁵Pediatric Department, Professor, Amman, Jordan; ⁶Department of Medical Genetics, University of Athens, Athens, Greece; ⁷Department of Pathology, College of Medicine, University of Dohuk, Dohuk, Iraq; ⁸Département de génétique médicale, Institut National d'Hygiène, Rabat, Morocco; ⁹Genetic Clinic, Al Amal Maternity Hospital, Amman, Jordan; ¹⁰Department of Paediatrics, Faculty of Medicine and Health Sciences, United Arab Emirates University; ¹¹Department of Pediatrics, Tawam Hospital, United Arab Emirates University, Al-Ain, United Arab Emirates; ¹²Department of Human Genetics, University Tunis El Manar, Faculty of Medicine, Tunis, Tunisia

Consanguinity and inbreeding increase the sharing of alleles among individuals; thus a considerable number of autosomal recessive phenotypes occur in offspring(s) of consanguineous couples. We have collected samples from consanguineous families with different phenotypes of unknown etiology that are compatible with autosomal recessive transmission, in order to identify the responsible functional genomic variation. 42 families of different ethnic background have been collected so far. From each family, DNA from the patient(s), unaffected siblings and the parents is extracted. Samples are i/analyzed by array-CGH for the detection of homozygous deletions; ii/genotyped with a 720K SNP-array in order to identify Runs of Homozygosity and the areas of the genome that could include the causative variant; iii/exome sequenced (one affected individual/family). Mean coverage is 130x and 98.2% of the coding region of RefSeq is covered at least 8x. By comparing the genotyping and sequencing data, we found that Single Nucleotide Variants (that passed the quality threshold) were detected with a specificity of 99.95%, sensitivity of 97.7%, Positive Predictive Value 99.2% and Negative Predictive Value 98.6%. On average we identified 21901 variants/exome. So far we analysed 26 families and identified the causative variation in known genes in 3 of them: VLDLR, FKTN and DMP1. In 12 families 23 candidate genes/variants have been identified (more than 1 candidate genes/family). In 11 families the likely molecular defect has not been identified. Consanguineous families provide an opportunity to identify pathogenic variants responsible for recessive phenotypes and rapidly fill in the gap between genotype and phenotype.

Poster Symposium Presentations - Nursing

413 EFFECTIVENES OF THE CALA-DOL, A NEW NON PHARMACOLOGICAL METHOD TO REDUCE PAIN IN CHILDREN UNDERGOING INTRAMUSCULAR IMMUNIZATION: RANDOMIZED CONTROLLED TRIAL

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¹M Calamini, ²C Neri, ¹F Festini. ¹University of Florence; ²Meyer Children Hospital, Florence, Italy

Background and Aims Procedural pain due to immunization is often untreated due to the limited effectiveness of available methods. The aim of this study is to value the effectiveness of a psychosomatic technique called Cala-Dol for the reduction of pain caused by immunization in children.

Materials and methods: Randomized controlled trial. 500 children aged 3 to 13 undergoing intramuscular vaccination against meningitis in the deltoid muscle were enrolled and randomized into two groups. Group A received standard care (no intervention), group B received the Cala-Dol technique. Cala-Dol consists in a combination of local cutaneous stimulation with two small rubber balls -one smooth and one with soft protrusions- and distraction. The cost of the devices is 2 Euros. Two Pain was measured with a 0-10 faces Wong scale (up to 7 years) or a 0-10 Visual analog scale (VAS).

Results Mean pain score in Group B (2.2, sd 1.89) was significantly lower than pain score in Group A (3.38, sd 1.84, $p=0.0001$). Children were stratified according to age. With regards to age, pain score