ID: 30

TITLE: ANTENATAL AND DEMOGRAPHIC FACTORS AND THE RISK OF BRONCHOPULMONARY DYSPLASIA (BPD) IN PRETERM INFANTS

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CONTENT:

Bronchopulmonary dysplasia (BPD) remains an important cause for significant morbidity and mortality in preterm infants with a substantial burden on health services. The aetiology is multifactorial and yet to be fully understood.

The aim of our study was to evaluate the association selected antenatal and demographic factors with BPD in preterm babies born in the two tertiary neonatal units in Nottingham, United Kingdom between January 2012 and March 2017. This was a retrospective observational study looking at the preterm babies below 33 weeks’ gestation born and cared for in the two tertiary care neonatal units in Nottingham. The data was collected from the neonatal and maternity databases.

BPD was defined as a need for additional oxygen at 36 weeks post conceptual age. The factors evaluated include maternal smoking status at the time of booking, social deprivation scores, small for gestational age, ethnicity and use of antenatal steroids. The data was analysed using Mann-Whitney test, Wilcoxon signed rank test, Fisher’s Exact test and Kruskal-Wallis test.

752 neonates born below the age of 33 weeks’ gestation were included in the study. Lower gestational age and birth weight were associated with BPD (p value 2.2e-16). Additionally, being small for gestational age was another significant factor shown to be associated with BPD (Odds ratio 2.5, 95%CI 1.17, 4.96). Other factors such as maternal smoking status at booking, social deprivation scores and ethnicity did not reach statistical significance in our study to show association with development of BPD. Antenatal steroids did not confer protection against BPD in our study group.

BPD is associated with lower gestation, lower birthweight and being small for gestational age. Maternal smoking status, ethnicity and social deprivation scores did not show association with BPD.

COI: None declared
ID: 66

**TITLE:** LUNG DEPOSITION EFFICIENCY OF NEBULIZED PORACTANT ALFA IN SPONTANEOUSLY-BREATHING NEWBORN PIGLETS: COMPARISON OF CPAP VS PRESSURE SUPPORT VENTILATION VIA NASAL PRONGS

**AUTHORS:** Nord A 1; Linner R 1, Salomone F 2; Bianco F 2; Ricci F 2; Murgia X 3; Schlun M 4; Cunha-Goncalves D 1; Perez-de-Sa V 1

**AFFILIATIONS:** 1 Department of Clinical Sciences, Lund University, Skåne University Hospital, Lund, Sweden; 2 Department of Preclinical Pharmacology, R&D, Chiesi Farmaceutici S.p.A., Parma, Italy; 3 Department of Drug Delivery, Helmholtz Institute for Pharmaceutical Research Saarland, Saarbrücken, Germany; 4 PARI Pharma GmbH, Starnberg, Germany

**CONTENT:**

Aerosolized surfactant delivery to preterm neonates on non-invasive ventilation has been associated with poor lung deposition rates, precluding the clinical implementation of nebulized surfactant therapy. In this study, we compared the lung deposition of nebulized surfactant (poractant alfa) delivered with a customized eFlow Neos investigational vibrating-membrane nebulizer system to healthy newborn piglets managed either with nasal continuous positive airway pressure (nCPAP) or with nasal pressure support ventilation (nPSV).

Twenty-five newborn piglets (1.16–2.2 kg) were sedated and supported with either nCPAP (3 cmH2O, n=12) or nPSV (3 cmH2O + 3 cmH2O PEEP, n=13) via custom-made nasal prongs (FiO2 0.5, Servo-I ventilator). All piglets received 200 mg/kg of technetium-99m-labeled surfactant by continuous nebulization. Blood gases were taken before and after surfactant nebulization. The surfactant deposited in the lungs was measured by gamma scintigraphy. Statistical analysis was performed with the t-test.

Mean surfactant deposition was 15.9 ± 11.9 % in the nCPAP group and 21.6 ± 10 % in the nPSV group (p=0.20). Respiratory rates were similar in both groups. Minute volume (MV) was 535 ± 197 mL in the nCPAP group and 796 ± 251 mL in the nPSV group (p=0.009). Blood gases were similar in both groups (table 1).

Irrespective of the non-invasive ventilation mode used, relatively high surfactant deposition rates were achieved with nebulization. The deposited surfactant amounts are promising for their potential to elicit a sustained pulmonary function improvement in the context of respiratory distress syndrome of the neonate.

**IMAGES:**
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=fd468502eb7b6cb264e1ac749f00c75-MjAxOS0wNSM1Y2UvNjY2YmMzNGYx

Table 1 - Arterial blood gases in healthy newborn piglets before and after nebulization. Data presented as mean ± SD.

**COI:** The study was funded by a grant from Chiesi Farmaceutici S.p.A
Federico Bianco, Fabrizio Salomone and Francesca Ricci are employed by Chiesi
Martin Schlum is employed by Pari Pharma
Xabi Murgia is a Consultant for Chiesi
Valeria Perez de Sa, Anders Nord, Doris Cunha Goncalves, Rikard Linner, none to declare
ID: 323
TITLE: UREAPLASMA SPP. COLONIZATION IS ASSOCIATED WITH WORSE RESPIRATORY OUTCOME IN EXTREMELY LOW GESTATIONAL AGE INFANTS
AUTHORS: Rashmi A. Mittal, Sarah J. Tapawan, Abdul A. Alim, Bin H. Quek, Victor S. Rajadurai
AFFILIATIONS: Department of Neonatology, K.K. Women’s and Children’s Hospital, Singapore

CONTENT:

Background: Ureaplasma spp. colonization has been associated with development of chronic lung disease (CLD) in preterm neonates. However, its relationship with the severity of CLD is not known.

We retrospectively analyzed data for extremely low gestational age neonates (ELGAs, GA less than 28 weeks) born between January 2016 and December 2018 with respect to Ureaplasma spp. colonization (n=184). Tracheal aspirate (TA) was sent for Ureaplasma spp. detection on grounds of clinical suspicion. All Ureaplasma+ neonates were treated with Azithromycin for 10-14 days. Data was analyzed for neonatal characteristics and outcomes for ELGAs who survived up to 36 weeks. Severe CLD was defined as requirement for respiratory support or need for oxygen (FiO2) >30% at 36 weeks.

The neonates in whom TA was sent (n=59) were of a significantly lower GA (25.9±1.1 vs 26.6±1.1, p=0.02). Ureaplasma+ neonates (23/59) had significantly higher incidence of leukocytosis and preterm premature rupture of membranes (PPROM)>3 days as compared to the Ureaplasma- group [15/23 (65%) vs. 12/36 (33%) and 13/22 (59%) vs. 9/36 (25%), p<0.05 respectively). The incidence of severe CLD was higher in Ureaplasma+ infants as compared to Ureaplasma- and all ELGAs (83% vs. 65% vs. 43% respectively). The FiO2 requirement at 36 weeks and the incidence of oxygen-use at discharge was significantly higher in the Ureaplasma+ group [31±10 vs. 23±4, p=0.003; and 17/22 (77%) Vs. 15/32 (47%), p=0.03, respectively).

In our centre, TA Ureaplasm colonization is associated with worse respiratory outcome at 36 weeks and at discharge. However, as not all ELGAs were screened for Ureaplasma, it is possible that this outcome is observed in those with a significant antenatal history of PPROM or leukocytosis in the first week of life. Further studies are required to evaluate the role of Ureaplasma spp. in long-term respiratory morbidities in ELGA infants.

COI: None declared
ID: 357
TITLE: LOW CD44 LEVELS COMPENSATED BY ENHANCED RHAMM EXPRESSION IN THE DEVELOPING LUNG MAY BE DEPENDENT ON THE GESTATIONAL AGE
AUTHORS: Laszlo Markasz 1, Richard Sindelar 1;
AFFILIATIONS: 1. Department of Women’s and Children’s Health, Uppsala University, Uppsala, Sweden

CONTENT:

The extracellular matrix component hyaluronan (HA) has a significant role in lung development. CD44 and the receptor for HA-mediated motility (RHAMM) are two major receptors for HA, involved in cellular proliferation, differentiation, and motility. The role of CD44 in fetal lung development is not well established. We have previously shown how RHAMM expression HA content changes in the lung due to various perinatal and maturational factors (Markasz et al, Early Hum Dev, 2018; Johnsson et al, Biol Neonate, 2003). This study complements our knowledge on CD44 expression in the postnatal lung development by analyzing human lung specimens from ventilated newborn infants at different gestational and postnatal ages with a variety of different lung diseases.

Ninety-three postmortem lung samples were analyzed from infants born 1990–1996, at a postnatal age of 0–228 days and gestational age 23-41 weeks. Immunofluorescence staining was performed with antibody for CD44. Representative sections were examined by standard fluorescence microscopy. Analysis of 279 digital images was performed by Image J software. CD44 expression and the clinical data were analyzed together with RHAMM expression, lung air and HA content by two-dimensional hierarchical clustering.

Patients could be sorted into six groups by hierarchical clustering analysis (Figure 1). Extremely preterm (Group 1 and 2) and moderately/term neonates (Group 3 and 4) appeared separately. Strong negative correlations appeared between RHAMM and CD44 expression when analyzing Group 3 and 4 but not with Group 1 and 2 (Figure 2). No correlations between CD44 expression level and postnatal age or gestation age at death were observed.

Several studies indicate a possible interaction between CD44 expression and the expression of RHAMM. We could show that RHAMM expression increases in the lung if low CD44 levels occur in moderately and term neonates but not in extremely preterm neonates. Our study suggest that the possibility for compensation for low CD44 with RHAMM may be dependent on the gestational age at birth.

IMAGES:

Figure 1- Figure 2

COI: None declared.
ID: 581

TITLE: BENEFITS OF SURFACTANT THERAPY IN PNEUMONIA AND PNEUMOTHORAX IN NEONATES

AUTHORS: Gabriela Zaharie1, Monica Hasmasanu1, Veronica Obada1, Blaga Ligia1, Tudor Drugan2, Alexandru Zaharie3, Melinda Matyas1

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3.AKH- Viena, Austria

CONTENT:

Surfactant therapy is widely supported by literature in respiratory distress in premature newborns but is less standardized at the late preterm or term newborn with pneumonia and pneumothorax where surfactant may be inhibited.

We hypothesized that the use of exogenous surfactant would decrease the risks of complications or death in pneumonia and pneumothorax.

The prospective study was conducted in the Neonatology I Department, Cluj, since January 2014 - January 2019. The case group consisted in 26 cases of newborns BW(birth weight) = 2745±110g and gestational age (GA)= 35±1.5 weeks and 46 cases of a control group with BW= 3320±79 and GA= 36±1.7 weeks.

We analyzed the need of resuscitation in the delivery room, Apgar score, type of respiratory support, blood gas parameters, administration time of surfactant and ratio PaO2 / FiO2 before and after administration of surfactant replacement for the case group. We quantified the resuscitation in the delivery room as: 1- routine care, 2- need of positive pressure support, 3- need of intubation.

Statistical analysis was done with SPSS. All participants had informed consent given and signed.

The severity of respiratory distress was similar (table I).

The Apgar score was similar in all cases(p=0.41). The resuscitation maneuvers were also similar.(p=0.39)(table II).

Referring to diagnostic the FiO2 in the delivery room was significantly higher in the group which develop pneumothorax(p=0.005)(table III).

Surfactant was administrated with the newborn intubated. In the case of pneumothorax we applied HFO and for pneumonia for the first time we applied conventional ventilation:SIMV(table III).

The administration time for surfactant was 18.5 hours of life, consider both pathologies.

The need of oxygen significantly decrease significantly in both studies groups. after surfactant replacement(p=0.001)( table IV).

Ratio PaO2/ FiO2 increased significantly after surfactant administration from 0.85 to1.65(p=0.00) in all the cases. Mortality was not influenced by surfactant administration.

The benefits of surfactant administration are: reduce the duration of respiratory support significantly in pneumonia group, decrease the FiO2, improve oxygenation and increases the ratio PaO2 / FiO2, both in pneumonia and pneumothorax groups.

Surfactant was administrated later compared than in RDS, at 18,5h of life.

Surfactant administration has no influence on the mortality either in pneumonia or pneumothorax.

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COI: None declared
ID: 599

TITLE: TIMELINE OF RESPIRATORY FUNCTION CHANGES FOLLOWING ADMINISTRATION OF SYSTEMIC POSTNATAL CORTICOSTEROIDS IN EXTREMELY PRETERM INFANTS

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CONTENT:

Systemic postnatal corticosteroids represent a common clinical intervention aiming to prevent or treat bronchopulmonary dysplasia in mechanically ventilated prematurely-born infants. Knowledge of the timeline of respiratory function changes following their administration could help define the optimal timing for extubation and would enable clinicians to assess response to treatment.

Our study aimed to describe the timeline of respiratory function changes before, during and after the administration of systemic corticosteroids, their effect on oxygen diffusion and ventilation efficiency and explore demographic parameters that can determine the magnitude of response to treatment.

Retrospective cohort study of ventilated preterm infants that received a nine-day course of dexamethasone at a tertiary neonatal unit in ten years. The response to corticosteroids was defined as the difference between the FiO2 before starting steroids and lowest value of FiO2 during the course. We calculated the transcutaneous saturation to fraction of inspired oxygen (FiO2) ratio (SFR) to characterize oxygen diffusion and the ventilation efficiency index (VEI) to describe the efficiency of ventilation before, during and after the steroid course. Using two paired values of FiO2 and SpO2 for each infant, we calculated the ventilation perfusion ratio (VA/Q), the right shift of the oxyhaemoglobin dissociation curve and the percentage of right-to-left shunt for three time endpoints.

Seventy (38 male) infants with a median (IQR) gestational age of 25.0 (24.3-26.0) weeks and a birth weight of 0.70 (0.63-0.82) kg were studied. The median (IQR) FiO2 dropped from 0.69 (0.57-0.81) before steroids to a minimum of 0.41 (0.35-0.53) 9 days after steroids. The median (IQR) SFR increased from 1.42 (1.19-1.72) before steroids to a maximum of 2.35 (1.87-2.83) at nine days after starting the course. The VA/Q before the course was 0.14 (0.11-0.18) and significantly lower than at 72 hours after starting treatment [0.22 (0.15-0.29), p<0.001]. The VEI increased from 0.06 (0.04-0.08) before steroids to a maximum of 0.10 (0.07-0.13) at 48 hours after starting steroids. The median (IQR) right-to-left shunt decreased from 10 (7-14) % before steroids to 7 (4-12) % 72 hours after their commencement (p=0.033). GA was significantly related to the response to steroids (rho=0.283, p=0.019).

Administration of systemic corticosteroids is associated with significant improvement in oxygen diffusion that lasts for the whole duration of the course. This improvement is characterized by an increase in the ventilation/ perfusion ratio and a decrease in intrapulmonary shunt. Less mature premature infants have a smaller response to corticosteroids compared to their more mature counterparts and exhibit a smaller decrease in oxygen requirement.

COI: None declared
ID: 696
TITLE: EFFECTIVENESS AND TOLERABILITY OF LISA (LESS INVASIVE SURFACTANT ADMINISTRATION) IN A TERTIARY NICU
AUTHORS: Javeria Z. Ahmed
Harsha Gowda
AFFILIATIONS: Neonates,
Birmingham Heartlands Hospital,
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United Kingdom

CONTENT:

LISA (Less Invasive Surfactant Administration) is a method using a thin catheter as an alternative to an endotracheal tube for surfactant administration in spontaneously breathing preterm infants with respiratory distress syndrome receiving non-invasive ventilator support. A recent comparison of 7 ventilation strategies for preterm (including CPAP alone, INSURE, LISA, NIPPV, nebulized surfactant administration, surfactant administration via laryngeal mask airway and mechanical ventilation) showed that the use of LISA was associated with the lowest rate of death or BPD at 36 weeks’ postmenstrual age. We aimed to assess the effectiveness and tolerability after successful implementation of LISA

Prospective observational audit over a period of 11 months from June 2018 to April 2019. The surfactant dose used for LISA was 200mg/kg. Pre-medications used prior to LISA were Atropine and Fentanyl. In a few cases, instead of pre-medications sucrose was used and infant was swaddled. LISA cath was used for surfactant administration. Video laryngoscope was used for most of the cases. Infants were on continuous monitoring for heart rate and saturations during and after the procedure. LISA failure is defined as need for intubation and ventilation within 48 hours after LISA.

Total of 18 LISA were done during the study period. Median gestational age was 30+6 weeks (27+6 to 37+3). Mean Birth weight was 1.48 kg (0.635 kg - 3.8 kg). Median age for LISA was 14.6 hours (1 hour - 31 hours). 15 infants were on high flow and 3 were on CPAP before LISA. FiO2 ranged from 30% to 70% pre-LISA which came down to 21% to 35% post LISA. Pre-medications atropine and fentanyl were used in 66.6% of infants and sucrose & swaddling was used in 11%. LISA failure was in 11% (2/18) needing intubation and ventilation with further dose of surfactant. 22.2% had desaturations and 5.5% had brady cardia (heart rate less than 80/min). One infant had apnoea. 16.6% have Chronic Lung Disease (oxygen requirement at 36 weeks post menstrual age).

LISA is well tolerated in preterm infants. Even though numbers are small in our audit only 11% had LISA failure needing intubation. Our neonatal staff is now familiar with the LISA procedure, so this encourages them to do the LISA in more extreme preterm infants. We are aiming to take LISA to the delivery suite in future.

COI: None declared
**ID:** 712  
**TITLE:** DISCORDANT PREGNANCY AND INTRAUTERINE GROWTH RETARDATION: NEONATAL EVOLUTION OF THE EUTROPHIC TWIN.  
**AUTHORS:** Titouan Thiry 1  
Catheline Hocq 2  
Olivier Danhaive 3  
**AFFILIATIONS:** 1, 2, 3 Cliniques Universitaires St Luc, Brussels, Belgium

**CONTENT:**

Weight discordance between fetuses occur frequently in dichorionic-diamniotic twin pregnancies. The presence of a weight discordance is associated with neonatal complications at various levels (digestive, neurological, hemodynamic and other) in the hypotrophic twin, whereas an increased risk of respiratory complication has been described in the eutrophic child compared to the hypotrophic one in the few available reports. The aim of the study is to describe neonatal outcomes of the eutrophic sibling in discordant twin pregnancies with premature induction of delivery for intrauterine growth restriction (IUGR) of the other sibling.

This is a retrospective single-center study conducted between January 2006 and December 2015. Out of 543 twin pregnancies, 3 groups were selected: the study group was composed of the eutrophic twin from discordant pairs (n=21), the control group included eutrophic twins born from non-discordant pairs (n=42), and the IUGR group consisted of the hypotrophic siblings of the study pairs (n=20 - one intrauterine death). The neonatal morbidities analyzed were: need of respiratory support (invasive and non-invasive), necrotizing enterocolitis, early onset sepsis (suspected, clinical or proven), metabolic disorder (hypoglycemia and/or need of phototherapy) and retinopathy. We used Chi-square, t-student and Anova statistical tests.

Mean gestational age at birth was 34 weeks. Mean birth weight was 2,150g for the study group, 2,148g for the control group and 1,403g for the IUGR group. 52% of study group need respiratory support vs 38% of control group and 15% of IUGR group (Anova: p= 0,04); there was a statistical difference between the study group and the IUGR group (p = 0,01), but none between the study group and the control group (p = 0,28). There were no significant differences between other morbidities, except metabolic disorders: 80% of IUGR neonates developed metabolic disorders vs. 57% of their eutrophic siblings and 48% of control twin (Anova: p=0,02).

The difference in respiratory morbidity observed between eutrophic and IUGR siblings results from a better-than-expected respiratory course in the IUGR sibling, who appears protected against neonatal respiratory failure. Conversely, respiratory failure in the eutrophic siblings appear related to induced prematurity.

**IMAGES:**
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Comparison of respiratory support's need between study, control and IUGR groups

**COI:** non declared
ID: 798

TITLE: A NEONATE WITH UNEXPECTED CHRONIC LUNG DISEASE IN ASSOCIATION WITH PERIVENTRICULAR NODULAR HETEROOTOPIA

AUTHORS: Rachel Walsh 1; Dushyant Batra 2; Abhijit Dixit 3; Jayesh Bhatt 4

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4 Paediatric Respiratory Medicine, Queens Medical Centre, Nottingham University Hospitals Trust, Nottingham, UK

CONTENT:

Chronic lung disease is not an unexpected pathology in ex-preterm neonates at discharge. There are, however, a small number of children with clinical features and radiological findings in keeping with this diagnosis who do not fit the expected phenotype. This group of children may not be of the expected gestation or have significant risk factors for chronic lung disease. In this cohort, there is a need to look closely for atypical features and to investigate for alternative diagnoses. This case demonstrates the importance of considering all associated systemic findings.

Baby H was born by emergency caesarian at 35+3 weeks gestation. The pregnancy had been uncomplicated but she had a subsequent 32 day admission to the neonatal unit due to respiratory distress and oxygen requirement. She received CPAP, high flow and low fl

This case adds to the growing number of children with FLNA-related lung disease. It is an important example of the need to thoroughly investigate those with an atypical presentation of a common illness or disease. This growing cohort gives weight to the suggestion that MRI brain and/or FLNA analysis should be considered in cases of unexplained chronic lung disease. Examination and consideration of systemic features must not be overlooked.

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COI: None declared
ID: 806

TITLE: "THE IMPACT ON BRONCHOPULMONARY DYSPLASIA INCIDENCE AFTER THE IMPLEMENTATION OF THE PROTOCOL WITH THE GUIDELINES OF THE EUROPEAN CONSENSUS ON RESPIRATORY DISTRESS SYNDROME IN PRETERM INFANTS".

AUTHORS: Fukamichi, SL1, Martins-Celini, FP1, Aragon, DC1, Gonçalves, AB; Carnevale-Silva, A1, Calixto, C1, Ferreira, CHF1, Maiolini, BL1, Toffolo, RO1, Souza, GA1, Silva, ACB1, Martins-Filho, PF1, Souza, TR1, Couto, LDCA1; Gonçalves-Ferri, WA1

AFFILIATIONS: Department of Pediatrics , Ribeirão Preto School of Medicine, University of São Paulo

CONTENT:

The treatment of respiratory distress syndrome (RDS) still presents several points under discussion. The 2016 European Consensus on Respiratory Distress Syndrome normalized the care of preterm newborns with the disease in order to try to reduce the morbidity and mortality of these patients. Some units do not have specific protocols for the management of RDS which can determine negative reflexes in the neonatal outcomes. Thus, the objective of this study was to analyze the incidence of bronchopulmonary dysplasia (BPD) and death rates in very low birth weight (VLBW) infants after the implementation of the protocol based on the recommendations of the 2016 European Consensus on RDS.

Cohort. Included VLBW infants with SDR born at tertiary hospital. Excluded malformations and deaths in the delivery room. Study groups:

Group 1: VLBW infants 2010-2014, prior to protocol implementation, beractant (100mg/kg), FiO2> 60% and first dose after 2 hours of life. Group 2: VLBW infants 2016 - 2018, after protocol implementation, first dose of poractant alfa (200mg /kg) in ≤26 weeks GA or FiO2 > 40% and > 26 weeks GA, before 2 hours of life.

RR with their respective 95% IC were calculated, adjusted through simple and multiple log-binomial regression models. Inferential trees were used to associate Groups 1 and 2 with estimates of relative risks considering gestational age, use of antenatal corticosteroids, early sepsis and maternal chorioamnionitis as covariates (SAS 9.4).

Were born 957 VLBW infants with SDR, 858 completed the study. GA and birth weight means: 28.8 weeks (SD 3.1) and 1025.3 g (SD 301.8). Group 1: 581 newborns (67.8%); Group 2: 277 (32.2%). Significantly lower occurrence of BPD (18.1% vs 49.3%) in Group 2, even when the analysis adjusted for other risk factors [ AdjRR = 1.38 ( CI 95% 1.08 to 1.78) ].

Risk for BPD was 1.7 (CI 95% 1.24, 2.36) for patients submitted to surfactant re-treatment on Group 1, on Group 2 was not observed risk; RR= 1.54 (CI95% 0.59; 4.0).

Inference tree: Patients ≤ 26 weeks GA had high occurrence of BPD regardless of the treatment. Newborns > 29 weeks GA following European Consensus recommendations had significantly reduced occurrence of BPD, (p <0.01), even with other risk factors for BPD. However, patients pre-protocol, had higher incidence of BPD, and covariates significantly increased the risk of BPD. (Figure 1)

The European Consensus Guidelines for SDR 2016 implementation reduced BPD in VLBW infants. Preterm ≤26 weeks had high BPD rate regardless of the treatment submitted. Patients ≥ 29 weeks, the adequacy of the protocol decreased occurrence of BPD even in the presence of associated factors (early sepsis, absence of antenatal corticosteroids or need of retreatment). Therefore, these guidelines should be implemented in all neonatal units.

IMAGES:

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COI: None declared
ID: 887  
**TITLE:** SEMIQUANTITATIVE LUNG ULTRASOUND, SURFACTANT FUNCTION AND INFLAMMATORY MEDIATORS IN PRETERM NEONATES WITH RDS  
**AUTHORS:** Giulia Vigo1; Shivani Shankar-Aguilera1,3; Autilio C4; Nadya Yousef1; Daniele De Luca1,2,3  
**AFFILIATIONS:** 1 Division of Pediatrics and Neonatal Critical Care, Medical Center, ‘A. Béclère’, South Paris University Hospitals, Assistance Publique-Hopitaux de Paris (APHP), Paris - France; 2 Physiopathology and Therapeutic Innovation Unit – INSERM U999, South Paris/Saclay University, Paris – France; 3 Lab of Bronchial Diseases, Institut Pasteur, Paris; 4 Department of Biochemistry and Molecular Biology, Faculty of Biology, and Research Institut-Hospital “12 de Octubre”, Complutense University, Madrid - Spain  

**CONTENT:**  
Lung ultrasound using a semiquantitative score has been proven to significantly correlate with oxygenation and predict surfactant need in preterm and extremely preterm babies.(1,2) We do not know, however, if there is any relationship between lung tissue inflammation and the lung aeration measured by lung ultrasound score (LUS). We aim to investigate this issue.

Prospective, translational cohort study, within a larger project on surfactant catabolism whose protocol has been published elsewhere.(3) Babies enrolled in this project underwent nonbronchoscopic bronchoalveolar lavage (BAL) to study inflammatory mediators and surfactant efficiency, prior to any surfactant administration. Inflammatory mediators were measured with customized Luminex and corrected for serum-to-BAL urea ratio. Surfactant phospholipids were extracted and adsorption test was also done as we reported earlier.(4) As per clinical routine, all babies with RDS are evaluated with lung ultrasound and LUS is calculated, as we previously published.(5)

17 preterm neonates were enrolled. There were significant correlations between LUS and IL8 (rho=0.562 p=0.045), IL6 (rho=0.52 p=0.033) and total proteins (rho=0.52 p=0.05). There was also a significant inverse correlation between LUS and the adsorption of surfactant at the air/liquid interface (rho= -0.81 p=0.028).

Lung aeration, as measured by LUS, might be reduced by proinflammatory mediators and is inversely correlated to the surfactant efficiency, as expressed by the adsorption at the air-liquid interface.

**REFERENCES**
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5. Raschetti R. J Pediatr 2019

**COI:** none declared
ID: 974

**TITLE:** ANALYSIS OF TEMPORAL VARIATIONS IN CAFFEINE EFFICACY AND TOXICITY WITH A 24 HOUR DOSING REGIME IN PRETERM INFANTS

**AUTHORS:** Charlotte Bannink 1
Kathleen Lim 1
Charles Christoph Roehr 2
Andrew Marshall 3
Timothy John Gale 3
Peter Anderson Dargaville 1, 4

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4 Department of Paediatrics, Royal Hobart Hospital, Hobart, Tasmania, Australia

**CONTENT:**

Apnoea of prematurity occurs commonly in preterm infants as a result of respiratory system immaturity. Caffeine has been used for over 40 years in the treatment of apnoea, with well documented long-term safety and efficacy. The half-life of caffeine in newborns, estimated to be 60-100 hours, has resulted in a preference for 24 h dosing. Temporal variations in caffeine efficacy and toxicity with a 24 hour dosing cycle have not been fully elucidated in the preterm infant.

This was an observational adjunct to an interventional study of automated oxygen control in preterm infants. 5sec, >10 sec and >15 sec were identified in the capsule pneumography signal. Heart rate (HR) was sourced from the bedside cardiorespiratory monitor. In each infant, average HR, RR and respiratory pause frequency were determined in pooled data from 5 time epochs in relation to caffeine dosing (0-2 h post-dose, 2-6 h, 6-12 h, 12-18 h and 18-24 h).

35 infants were studied, of mean gestation at birth 27 completed weeks (SD 1.85) and post-natal age 19 (13) days. Data were available from 5.0 (1.4) caffeine dose cycles per infant; caffeine dose was 6.5 (1.6) mg/kg caffeine base. The therapeutic effect of caffeine on cadence of respiration was maintained throughout the 24 h after caffeine administration, with RR and respiratory pause frequency similar in all post-dose epochs (Table). By contrast, HR was influenced by proximity to the last caffeine dose, with a 13 bpm overall reduction in HR in the period 18-24 h post-dose compared to other epochs (Table). Post-dose increase in heart rate did not correlate with caffeine dose in each infant.

These results demonstrate no loss of efficacy of caffeine with a 24 h dosing regimen, but suggest an element of toxicity with a higher heart rate for the first 18 h post-dose compared with the final 6 h.

**IMAGES:**
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=dd496e7deb46338b57a2aedfb2c1943b-MjAxOS0wNSM1Y2UyNjY2ZDNkMDUz

Caffeine efficacy and toxicity data stratified into time epochs in relation to caffeine dosing

**COI:** None declared