POSTER SESSION 4 – LUNG 1
SEPTEMBER 15, 2021 – 13:00 – 14:30 CEST

ID 16 -AN X-RAY SCORE TO DESCRIBE EVOLVING BRONCHOPULMONARY DYSPLASIA (BPD) IN PRETERM BABOONS.

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BACKGROUND
After preterm birth, the immature lung undergoes morphological and functional changes often resulting in alveolar and capillary hypoplasia, termed "new" BPD. Estimating those changes is challenging in a clinical context due to a lack of an appropriate surrogate. We hypothethized, that a quantitative x-ray score indicates lung function and histologic changes.

METHODS
Preterm baboons (n=13, mean gestational age 126 days (term= 185 days), mean birth weight 369g) were intubated, got surfactant and mechanical ventilation. Baboons received intensive care treatment for 14 days. Daily chest X-rays were done, oxygenation (OI) and ventilation (VI) indices were calculated for every 24h. Lung morphology was evaluated postmortem by design-based stereology. Chest X-rays were evaluated by a scheme including the criteria lung haziness and visibility of limits of heart and diaphragm. Based on that an x-ray score was established from 0 (= normal findings) to 30 (= white lung). Rank correlation coefficient was used to validate the score.

RESULTS
The study shows a high correlation between OI and x-ray score with r= 0,62 (95%-CI [0,52 – 0,7], t=10,4, p<0,05) and VI and x-ray score with r= 0,63 (95%-CI [0,53 – 0,71], t=10,6, p<0,05)(see figure 1a). Heteroscedasticity with a statistical significant increase of dispersion in values ≥ 24 in x-ray score for both, VI and OI was seen, which was indicating potential limitations of the score in high values. A correlation of histology and the score of the final x-ray showed a high effect with functional/ventilated parenchyma (r=-0,64, 95%-CI [0,1 – 0,89], t=-2,6, p<0,05) and nonfunctional/not ventilated tissue (r=0,75, 95%-CI [0,31–0,93], t=3,6, p<0,05)(see figure 1b). Regarding the development of x-ray score over time, a typical radiographic course including characteristic maxima was described.

CONCLUSION

In this study, an x-ray score was developed to objectively measure changes in BPD. In comparison to former trials, that already showed correlations between x-ray findings and clinical severity, for the first time a correlation to functional and morphological parameters was shown and a typical radiographic sequence of evolving "new" BPD was described. Further studies should test its potential in clinical settings and research on evolving BPD since our data suggest individual and also typical patterns.

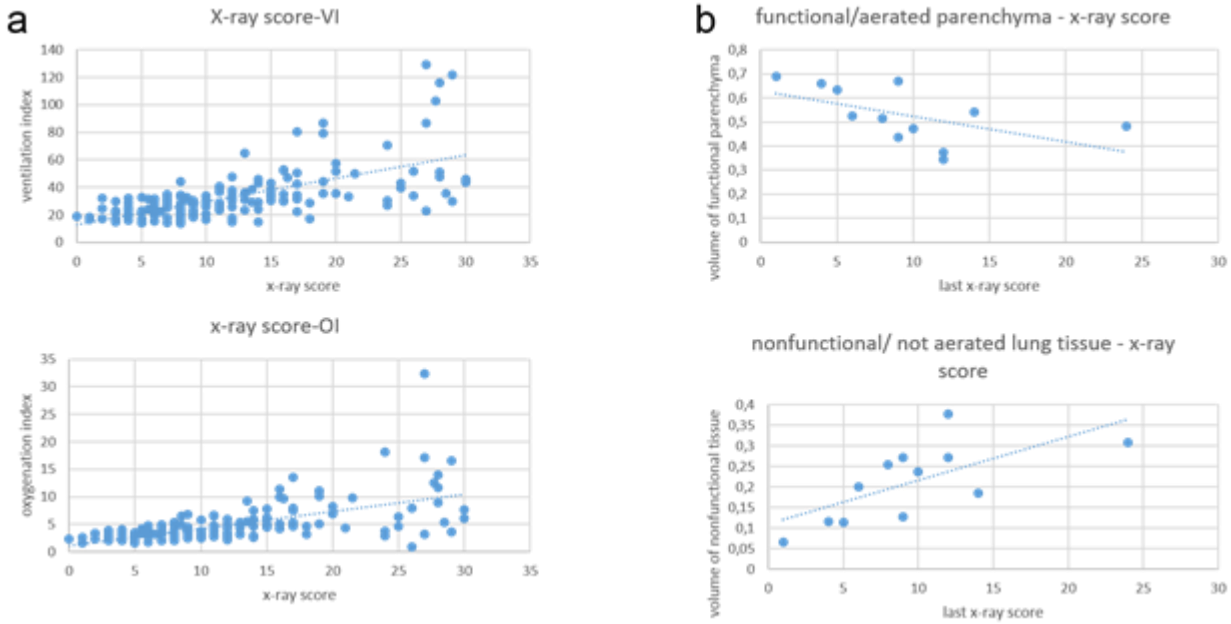

figure 1. (a) Graphical correlation between x-ray score and VI and OI. (b) Graphical correlation between x-ray score and functional/aerated lung parenchyma and non-functional/ not aerated lung tissue.

None declared

ID 259 - PRETERM RABBIT EXPOSED TO HYPEROXIA FOR 14 DAYS: A LONG-TERM MODEL OF BRONCHOPULMONARY DYSPLASIA.

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Background:
Bronchopulmonary dysplasia (BPD) remains a disabling consequence of preterm birth despite the recent advances in neonatal intensive care. In the hyperoxia-exposed preterm rabbit model, pups are delivered during the saccular stage of lung development and exposed to hyperoxia (95% oxygen, O2) for 7 days, thus combining two main etiological factors of human BPD: prematurity and hyperoxia. The present study aims to extend the model up to 14 days post-preterm delivery, in order to test drug candidates at more clinically relevant time points.

Methods:
Preterm rabbits delivered at 28th day of gestation, were exposed to different O2 concentration for 14 days, with/without concomitant intratracheal injections of bacterial lipopolysaccharides (LPS). Age-matched rabbits, born at term and cared by their mothers, were selected as physiological controls. At the end of experiments, body weight, survival, pulmonary function (i.e. inspiratory capacity, compliance, elastance and resistance), pulmonary aeration degree (by micro-CT scanning) and histological outcomes were assessed.

Results:
Normoxia exposure up to 14 days was feasible with good survival rates. Conversely, higher mortality rate was found in preterm pups exposed to 95% O2 for 7 days and gradually weaned to room air. Prolonged exposure to lower O2 concentration (50%) with/without intratracheal injections of LPS was well-tolerated but pups did not develop a severe BPD-like phenotype. Continuous exposure to 70% O2 for 14 days led to a significant pulmonary impairment in preterm pups, compared to normoxia-exposed group, as shown by lung function, histological outcomes, and micro-CT analysis. All preterm pups showed significantly worse outcomes compared to pups born at term.

Conclusions:
Preterm delivery triggers already a mild/moderate BPD phenotype compared to the term delivery. Exposure to 70% of oxygen for 14 days is a valid approach to obtain a stronger lung development arrest and this model could be a useful tool for in-vivo drugs screening. In order to improve the clinical translation of this long-term BPD model, additional antenatal and postnatal insults will be further evaluated.

Catozzi, Scalera, Stretti, Ricci, Aquila, Petracco, Villetti, Salomone, Grandi, Stellari are Chiesi Farmaceutici employees. Storti, Ferrini, Ravanetti, Ragionieri, Ciccimarra, Zoboli, Brandenberger, Lucattelli, De Cunto, Bartalesi have no conflicts of interest.

ID 306 - ANTENATAL FACTORS AND THE DEVELOPMENT OF BRONCHOPULMONARY DISPLASIA.

Doctor Cristina Ramos Navarro[1], Doctor Alba Perez-Perez[1], Doctor Rebeca Gregorio-Hernandez[1], Doctor Maria Arriaga-Redondo[1], Doctor Susana Zeballos-Sarrato[1], Professor Manuel Sánchez-Luna[1]
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Background:
Bronchopulmonary dysplasia (BPD) is the most frequent prematurity-related long-term sequelae. Its pathophysiology is multifactorial, involving a complex interaction between mechanisms of lung damage and repair that affect the lung in an early phase of its development. In most cases, this damage is initiated before birth. The aim of this study was to evaluate the impact of antenatal factors: gestational age (GA), gender, complete course of antenatal corticosteroids (ANS) and histologic analysis of the placenta, in the mortality rate and BPD development in our population of preterm infants.

Methods:
Observational, descriptive study including all infants born with less than 29 weeks of GA in our institution between January 2012-December 2020. BPD was diagnosed by consensus definition, considering type 2 (moderate) and 3 (severe). Mortality was considered at discharge. Histopathology of the placentas were classified as: normal, inflammatory or vascular disease as defined by Redline et al. Multivariable logistic regression was performed to identify factors independently associated to each of the main outcomes. Confusion and interaction of the study variables with the covariates were analyzed. Stratification was performed in case of significant interactions.

Results:
A total of 475 < 29 wGA infants were born during this period. In 75, placental histologic exam was missing so 400 subjects were included. Median GA was 26.4 (25.1-28.0), median birth weight 820 g (700-1009g), 228 were male (57%); 236 (59%) received ANS (complete course); 102 (23.5%) had normal placental histology, 144 (36%) inflammatory and 154 (38.5%) vascular pathology. Mortality rate was 25.5% (102); BPD 2/3: 38.6% (115); BPD 3: 11.7% (35). Outcomes are exposed in table 1. The effect of vascular placental histology and ANS on BPD 2-3 outcome differs according to GA and the effect of ANS on mortality differs depending on gender. Antenatal factors are responsible for 37 % of the variability in the SF-BPD outcome (AUC 0.803, 95% CI 0.754-0.852, p < 0.001).

Conclusion:
BPD is a very complex disease with GA being the most important risk factor. Prenatal factors have a major impact on mortality and BPD outcome and their effect may differ depending on the stage of fetal lung development.

ID 60 - BRONCHOPULMONARY DYSPLASIA AND LUNG FUNCTION AT 3 MONTHS CORRECTED AGE

Doctor Kristina Wendel[1], Specialist in clinical nutrition Madelaine Eloranta Rossholt[1], Doctor Marlen Fossan Aas[1], Doctor Gunnthorunn Gunnarsdottir[3], Professor Tom Stiris[1,2], Doctor, PhD Sissel Jennifer Moltu[1]
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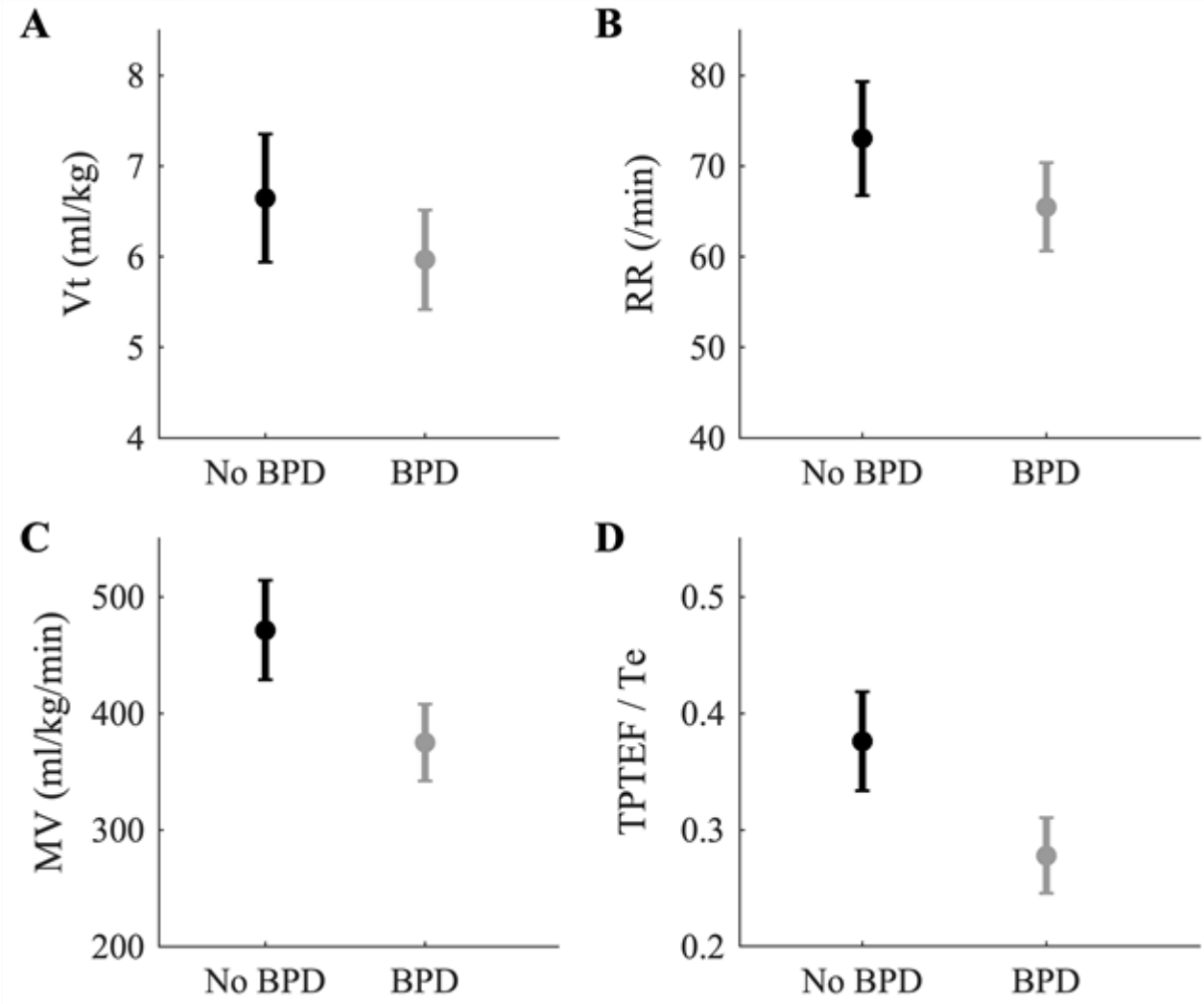
BACKGROUND
The diagnosis of bronchopulmonary dysplasia (BPD) is regarded as a relatively poor predictor of later lung function in premature infants. The aim of this study was to compare lung function at 3 months corrected age (CA) in very premature infants with and without BPD.

METHODS
Infants with gestational age (GA) < 29 weeks participating in a randomized controlled nutritional study (the ImNuT trial, NCT03555019) were included in the analysis. BPD was defined as need of respiratory support or oxygen treatment at 36 weeks post menstrual age. Lung function was assessed at 3 months CA by tidal breathing flow-volume loops with the infant awake, quietly breathing in an upraised position. A minimum of 10 stable flow-volume loops were required for a successful test. Tidal breathing parameters were adjusted for GA in the statistical analysis.

RESULTS
A total of 64 infants (38 with BPD and 26 without BPD) with mean ± SD GA (25.1 ± 1.51 versus 27.1± 1.29) had a successful test. Infants with BPD had significantly lower mean minute ventilation (MV) 375 (95%CI, 342-408) ml/kg/min compared to infants without BPD 472 (95%CI, 429-514) ml/kg/min, p= 0.001 and a significantly lower mean time to peak tidal expiratory flow as a ratio of total expiratory time (TPTEF/Te) 0.28 (95%CI 0.25-0.31) vs. 0.38 (95%CI 0.33-0.42), p =0.001 (figure 1). Other tidal breathing parameters did not differ significantly.

CONCLUSION
Adjusted for gestational age, infants with BPD have significantly lower minute ventilation and a more obstructive breathing pattern at 3 months CA compared to very preterm infants without BPD.



Tidal breathing parameters presented as means with 95%CIs
A.Vt, tidal volume B.RR, respiratory rate C.MV, minute ventilation D.TPTEF/Te, time to peak tidal expiratory flow as a ratio of expiratory time.

None declared

ID 102 - LUNG ULTRASONOGRAPHY DECREASES RADIATION EXPOSURE IN NEWBORNS WITH RESPIRATORY DISTRESS: A RETROSPECTIVE OBSERVATIONAL STUDY

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Background:
Chest X-ray is commonly used as a first line imaging method to diagnose the reason of respiratory distress in NICUs. Lung ultrasound is a new diagnostic tool for lung imaging, and, recently this method has been more commonly used in NICUs. We aimed to determine the decrease in the number of chest X-rays on the first day of life in newborns with respiratory distress, with the use of lung ultrasonography.

Methods:
From January 2019 to June 2020, 104 newborn infants hospitalized in the NICU with respiratory distress on the first day of life enrolled in this study (ClinicalTrials.gov Identifier NCT04722016). We used bed side ultrasound as the first line technique for lung imaging. Chest radiography was taken to determine endotracheal tube and umbilical catheter position or if considered necessary by the physician in charge of the infant. We calculated decreased number of chest X-ray for every patient and evaluated the estimated decrease in radiation exposure.

Results:
104 preterm and term neonates with median 36 weeks (25-40) gestational age and birth weight 2410 gr (600-4100) enrolled in the study. Seventy (67,3%) of these babies were male, 92,3% (n=96) were born by cesarean section.
In the study group, 24 (23,1 %) patients were diagnosed with respiratory distress syndrome (RDS) , 49 (47,1 %) patients with transient tachypnea of newborn (TTN), 27 (26 %) with pneumonia, and 4 (3,8 %) with Congenital Heart Diseases. Lung ultrasonography were performed 210 times for all infants, but chest X-rays were performed a total of only 107 times.
Chest X-ray was not taken in 27 of the patients with a diagnosis of TTN, in 2 of the patients with a diagnosis of congenital pneumonia, and in one of the patients with congenital heart disease. The rate of patients who have never had a chest x-ray was 28,8 %.

Conclusions:
Lung ultrasonography screening is a first line imaging technique for newborns with respiratory distress in our NICU. We observed that usage of lung ultrasonography decreased the number of chest X-ray and radiation exposure in newborns with respiratory distress.

None declared

ID 201 - IMPLEMENTATION OF A LUNG ULTRASOUND PROTOCOL TO DECREASE RADIATION IN NEWBORN POPULATION: A QUALITY IMPROVEMENT PROJECT

Doctor Javier Rodriguez Fanjul[1], Doctor Nuria Benet[1], Doctor Sara Bobillo-Perez[1], Doctor Roser Porta[1], Doctor Gemma Ginovart[1]
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Background:
Term and premature infants admited to neonatal intensive care unit (NICU) due respiratory distress are frequently exposed to radiation for diagnostic imatge trough chest X Ray (CXR).
In the present study we followed a Plan-Do-Study-Act cycle to develop and test the quality improvement (QI) intervention of the Integration of lung ultrasound (LUS) as a first image technique for newborns admitted to NICU for respiratory distress

Methodology
We followed the Plan-Do-Study-Act cycle to develop and test the quality improvement (QI) intervention of the integration of LUS as the first-line image for term and preterm babies admitted to the NICU with respiratory distress (Figure 1) after neonatologist received a 2 day e-learning practice course. To study the effect of the intervention we compare the previous 6 months were CXR was the first diagnose technique with the next 6 months once LUS protocol was implemented
Our primary objective was to evaluated the impact of LUS implementation on the exposure to CXR and the amount of total radiation to newborns.
Seconday objective were to evaluate if the introduction of the procotol respiratory suport measures, ventilator-free days (defined as the number of days spent in the NICU without invasive ventilation within the first 28 days, bronchopulmonary dysplasia rate, pneumothorax, mortality.

Results
122 patients were included in the study. There were no diffence between baseline data in bouth groups. During the first period 100% of the patient received at least one CXR, in the second period only 35%. LUS was performed to all babies in the secod period. The mean number of CXR for patient decreased from 2.3 (±1.5) to 0.38 (±0.6) and the mean radiation dose per baby decreased from 68 (±32) to 11 (±6) iGy in the second period. There no significantly changes in the secondary objectives between both groups.

Conclusions
The introduction of LUS protocol in a NICU without previous experience decreases the exposure radiation in both term and preterm infants without problems

ID 106 - A TRAINING PLAN OF E-LEARNING NEWBORN POINT OF CARE LUNG ULTRA-SOUND FOR PEDIATRIC FELLOWS

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Background:
Main clinical practice guidelines recommend learning lung ultrasound (LUS) for respiratory distress diagnosis in the neonatal intensive care unit (NICU) though there is little information on the level of training required for autonomy practice, especially for pediatric fellows (PF). The main objective of the study was to assess the implementation of a training program in neonatal LUS for PF and to analyze the interobserver variability between a senior consultant neonatologist (SCN) and PF.

Methods:
Prospective longitudinal study conducted in the Neonatal Intensive Care Unit of a tertiary hospital between November 2020 and April 2021. Following an 8 hour theoretical and practical training plan of newborn respiratory distress using LUS aftewards an analyze of the concordance between the SCN and the PF on their LUS reports was recorded.

Results:
21 NF were trained on LUS knowledge. Mean mark for the theorical after training exam was 13/15. A total of 228 LUS scans were performed. For aeration, the global Kappa coeficient (K) was 0.68 (95% CI 0.55-0.81). Regarding the presence of non compact B-lines K, was 0.82 (95% CI 0.8-0.87), for coalescent B-lines, K was 0.84 (95% CI 0.82-0.88), for pleural efussion, K was 0.87 (95% CI 0.83-0.89) showing almost perfect agreement.

Conclusions:
Our training plan allowed PF with no previous LUS experience to independently
perform LUS and might to help improve newborn respiratory distress diagnosis in NICU. We found a high agreement between SCN and PF in detecting the presence and type of RDS

None declared

ID 492 - TO EVALUATE ANY CORRELATION OF SIZE OF PATENT DUCTUS ARTERIOSUS AND BRONCHO PULMONARY DYSPLASIA.

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Background & Aim:
Patent ductus arteriosus (PDA) causes significant hemodynamic impact in extreme preterm infants and therefore increases morbidities. Studies shows treatment of PDA may or may not improve outcomes and spontaneous closure is the natural course of PDA. Treatment of PDA in extreme preterm on balance may have beneficial effect. Aim is to evaluate whether hemodynamically significant PDA increases risk of Broncho Pulmonary Dysplasia (BPD) and whether treatment of PDA prevent BPD.

Methods:
Retrospective observational study over two years (Jan 2017 to Dec 2019) in a level 3 neonatal intensive care unit. Preterm infants less than 28weeks with or without treatment to PDA were included and BPD rates analysed. PDA size is classified as large >2mm, moderate 1.5 to 2mm and small <1.5mm. BPD(Broncho Pulmonary Dysplasia) defined as oxygen requirement at 36 weeks corrected gestational age.

Results:
109 infants were studied with gestational age range from 24+1 to 28+6 weeks (mean 27weeks) and Birth weight 420g – 1500g (mean 924g). Echocardiography in first week of life was done on (50/109) 45.8%, and more than one echocardiography during the infant stay on NICU (n=80/109) 73.39%. 11 were excluded from analysis because either they died or transferred elsewhere. Among 69 infants, number of large PDA: 13, moderate PDA: 39 and small PDA: 17. Treatment received in large PDA group (n=12/13) 92.3%, moderate PDA group (n=16/39) 41% and small PDA group (n=0/17) 0.00%. BPD rates in large PDA group (n=9/130) 69.2%, moderate PDA group (n=20/39) 51.28% and small PDA group (n=10/17) 58.8%.

Conclusion:
Even though it is small sample size, there is no significant difference observed on BPD rate on size of PDA, and whether treated or not. Large randomised control studies are required to justify treatment for PDA to reduce incidence of BPD.

None

ID 375 - EFFECTS OF PREMEDICATION DURING LESS INVASIVE SURFACTANT ADMINISTRATION (LISA)

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Background:
Less invasive surfactant administration (LISA) is an effective way to administer surfactant in a spontaneously breathing infant with respiratory distress syndrome with the aim to avoid mechanical ventilation. Studies have shown that LISA reduces the incidence of bronchopulmonary dysplasia. The practice of premedication use during LISA remains variable and the aim was to determine the effects of premedication on LISA.

Methods:
A retrospective comparative cohort data analysis was performed on infants who received LISA with or without premedications over a 32 month period (June 2018 to February 2021) at a tertiary neonatal unit. Premedications used were atropine and half dose fentanyl. Non pharmacological methods include sucrose or swaddling or both. Adverse events specifically desaturations, bradycardia and apnoeas with premedication during LISA were compared with the non-premedicated infants. Data for the need of sedation reversal and subsequent intubation were also collected.

Results:
Out of 79 infants who had LISA performed over the study period, 8 infants were excluded from analysis due to missing data. 46/71 (64%) infants received premedications and 25/71 (35%) infants were not premedicated. The mean gestational age in the premedicated and non-premedicated groups were 30.1 weeks (range: 24 to 39 weeks) and 29.5 weeks (range: 25 to 33 weeks) respectively. The mean birth weight was 1.3kg in the premedicated infants and 1.4kg in non-premedicated infants. The occurrence of desaturations during LISA in the premedicated infants was 39.1% (18/46) versus 28% (7/25) in the non-premedicated infants. In the premedicated group, 7 infants had documented apnoea and 1 had bradypnoea during the procedure. 3 of these infants required Naloxone for sedation reversal. None of the infants in the non-premedicated group developed apnoea or bradypnoea. The infants who subsequently required intubation were similar in the premedicated and non-premedicated group (17.4% vs 20.0%).

Conclusion:
Even though our sample size was small, premedication led to a higher rate of desaturations and apnoeas during LISA but there was no significant difference in the rate of subsequent intubations. Larger studies are required to evaluate the role of premedication during LISA.

None declared

ID 447 - ANATOMICAL TRACHEAL PARAMETERS IN PREMATURE NEONATES WITH BIRTH WEIGHT LESS THAN 1000 g FOR EFFECTIVE AND SAFE LESS INVASIVE SURFACTANT ADMINISTRATION

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Objectives:
This study was conducted to evaluate the anatomical tracheal parameters of neonates and premature infants for clarifying the permissible and complications-safe (single-lung surfactant administration, surfactant regurgitation from the trachea) depth of insertion and «thin catheter» diameter during less invasive surfactant administration (LISA).

Materials and methods:
Autopsy of fetuses and preterm neonates with extremely low birth weight (ELBW), when deaths occurred before the age 168 hours of life. A total of 26 cases without congenital malformations of the respiratory system were included. The distance from glottis to the tracheal bifurcation, and tracheal perimeter under vocal cords, in the middle portion and on the level of the bifurcation was measured with calculation of tracheal diameter.

Results:
The average body weight was 684.6±160.8 g, gestational age ranged from 21 to 35 weeks, averaged 25 weeks. The distance from glottis to the tracheal bifurcation was 34.31±5.28 mm, tracheal diameter in upper, middle and lower thirds was 3.53±0.64 mm, 3.41±0.63 mm, and 3.89±0.78 mm, respectively.

Significance:
Taking into account our values during selection of catheter for LISA and depth of insertion in ELBW infants can help to avoid complications, such as single-lung surfactant administration and its regurgitation from the trachea during LISA, which can increase the efficacy and safety of the method.

Conclusion:
the length and diameter of trachea in neonates with extremely low birth weight in the early neonatal period depend on anthropometric values and gestational age at birth, mean length is 34.31±5.28 mm.

ID 535 - DO PRENATAL FACTORS IMPACT THE SEVERITY OF BRONCHOPULMONARY DYSPLASIA IN VERY LOW BIRTH WEIGHT INFANTS

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Bronchopulmonary dysplasia (BPD) is a common pathology in very low birth weight infants (VLBW), which can cause chronic lung sequelae, neurological impairment and worsen the overall results of treatment. The incidence of these consequences is increasing with the severity of BPD. It is important to establish the factors that contribute to the development of severe forms of BPD.
The study was aimed to identify prenatal risk factors that can impact the severity of BPD in VLBW infants.

Materials and methods.
Data obtained from a prospective database of VLBW infants treated at Lviv Regional Clinical Hospital between January 2010 and December 2020 were used in a retrospective cohort study. One hundred and thirty-six VLBW infants survived or died with BPD during that period. There were 84 cases of mild BPD (62%), which formed a mild BPD group, and 52 cases (38%) of moderate and severe BPD were combined into a group of severe BPD. The incidences of prenatal risk factors which could be associated with BPD were compared between the groups. BPD was defined according to the NIH consensus definition in modification of Walsh et al. (2003).

Results.
The study groups were not different in terms of birth weight and gestational age (913.92±192.22 g and 26.97±1.93 wks. in the mild BPD group and 955.76±250.77 g and 27.54±2.22 wks. in the severe BPD group; $p>0.05$). There were no statistically significant differences in maternal smoking rates, incidences of hypertension, preeclampsia regardless of its severity, abruption or disorders of placenta, intrauterine growth retardation, preterm premature rupture of membranes, chorioamnionitis, genitourinary tract infections, and frequencies of delivery via Caesarean section between the groups ($p>0.05$). Antenatal steroid prophylaxis was used less commonly in the severe BPD group, but the difference was not statistically significant ($p=0.09$).

Conclusions:
No prenatal factors have been identified influencing the severity of BPD. We can assume that postnatal factors play a key role in the development of severe forms of BPD in our population of VLBW infants.
None declared

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11-12 September 2021

ID 561 - RESPIRATORY DISTRESS IN LATE PRETERM AND TERM NEONATES: A RETROSPECTIVE STUDY

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BACKGROUND:
Respiratory distress is one of the commonest causes of hospitalization of late preterm and term infants in Neonatal Intensive Care Units (NICUs) globally. The recognition of specific risk factors and review of current therapeutic practices for this disorder is always of high importance in neonatal clinical practice.

METHODS:
A retrospective study was conducted among neonates with respiratory distress admitted to the NICU of our hospital, between January 2018 and December 2020. Eligible for the study were neonates with onset of symptoms during the first 6 hours of life and of gestational age 34-41 weeks. Neonates with infection, meconium aspiration syndrome, perinatal asphyxia, congenital heart or lung malformations and pneumothorax upon admission were excluded.

RESULTS:
A total of 242 neonates was included in the study, 64.5% male. Gestational age was 34 0/7-36 6/7 weeks in 61.6%, 37 0/7-38 6/7 weeks in 32.2% and 39 0/7-40 6/7 weeks in 6.2%. Large for gestational age were 8.7 % and small for gestational age were 5.8%. Cesarean section was performed at 89.3% of deliveries and gestational diabetes was present in 16.2% of pregnancies. No intervention was performed in 18.6% of neonates, 38.8% received supplemental oxygen via hood (mean duration 1.2 days), 61.2% received continuous positive airway pressure (CPAP) (mean duration 1.8 days) and mechanical ventilation was administered to 5.8% (mean duration 2.5 days). Endotracheal administration of surfactant was performed in 19.8%. Air leak incidence was 5.8% and no death occurred. The mean duration of tachypnea was 1.8 days and of hospitalization 9.6 days. In a sub-analysis between two groups, late preterm (34 0/7-36 6/7weeks) and term (37 0/7-40 6/7 weeks), in the late preterm group 22.1% received oxygen supplementation via hood versus 20.4% in the term group, 67% vs 51.6% received CPAP respectively, air leaks were present in 2.7% and 6.5% respectively while there was no difference in the mean duration of hospitalization between the oxygen supplemented and the CPAP treated neonates.

CONCLUSION:
Respiratory distress is a common, self-limited condition in neonates hospitalized in NICUs, mostly affecting late preterm infants of male sex, delivered by cesarean section. CPAP seems to be a safe and effective therapeutic strategy.
None declared

ID 602 - SHOULD PRETERM INFANTS HAVE VITAMIN A SUPPLEMENTATION TO PREVENT ROP AND BPD?

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Background:
Premature infants are at risk of vitamin A deficiency due to a shortened third trimester. Vitamin A is an essential micronutrient for the development of the lungs, retina, and the immune system. Vitamin A deficiency increases the risk of bronchopulmonary dysplasia (BPD) and retinopathy of prematurity (ROP) in preterm neonates. We reviewed the evidence for Vitamin a supplementation in preterm neonates to improve outcomes such as ROP and BPD.

Methods:
A review was conducted through MEDLINE, EMBASE and PubMed. Articles were selected on the basis of the quality of evidence assessed using Centre for Evidence Based Medicine Framework for Levels of Evidence. Initial literature search yielded 339 papers. 33 papers were fully evaluated and included.

Results:
Meta-analysis & systematic reviews both suggest that the incidence of BPD in preterm infants is lower in Vitamin A supplementation groups versus placebo-control groups. Vitamin A supplementation did not reduce the incidence of ROP in randomised-controlled trials (RCT) but observational studies have found aggressive supplementation can reduce serious disease in preterm infants. Vitamin A supplementation did not decrease mortality and was not associated with impaired development. However, evidence from one observational study suggested increased risk of sepsis but this was not supported by subsequent meta-analysis.

Conclusion:
Vitamin A supplementation may play a role in the prevention of BPD in preterm infants but vitamin A monotherapy is not associated with a benefit in prevention of ROP.

None Declared

ID 242 - THE USE OF SURFACTANT THERAPY IN THE NEWBORN INTENSIVE CARE UNIT

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BACKGROUND:
Surfactant therapy has been extensively studied in infants and has been shown to significantly decrease air leaks and neonatal and infant mortality.

METHODS:
A prospective study of 16 newborns with hyaline membrane disease(HMD) treated with administration of surfactant and hospitalized in the neonatal intensive care unit, between April 2019 and August 2019.The surfactant used is CUROSURF in all cases.

OBJECTIVES:
Analyze the epidemiological and clinical profile, the paraclinical investigations and also the therapeutic protocols the clinical and paraclinical evolution

RESULTS:
There was 68.75% of newborns who were hospitalized the first day of life with a male predominance of 87.5%. The most frequent gestational age was between 28WG and 34WG (in 87.5% of cases). 81.25% of Infants were not exposed to antenatal corticosteroids. 62.5% of infants had a high maternel risk of infections. On the physical examination; infants who weighted between 1000g and 1500g (62.5%). In 81.25% of newborn, we noticed a respiratory distress according to the silverman score above than 2/10.The chest X-ray showed an aspect of MMH stage II in 56.25% of the cases. A respiratory assistance type CPAP was used in 62.5% of cases.The surfactant cure was used beyond 24 hours of life in 50%, and in 25% of the cases was administered respectively before 6 hours of life and between 6 to 12 hours of life.
The technique used is INSURE in all newborns.A single course of treatment was administered to 93.75% of newborns with a dosage of 100mg / Kg.A control chest X-ray showed improvement in 62.5% of cases.In 31.25% of newborns, we objectified the improvement of respiratory distress and who no longer required respiratory assistance.
Of the 16 cases in our series, we noted two major complications; nosocomial infection with a percentage of 43.75% and alveolar hemorrhage in 12.5% of cases.

CONCLUSION:
The use of exogenous surfactant reduces the total duration of invasive ventilation in favor of non-invasive ventilation in premature babies. Its administration improves the respiratory prognosis as well as the general prognosis of newborns with hyaline membrane disease.

None declared

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ID 588 - A SECOND SURFACTANT DOSE - WHAT IS THE BEST STRATEGY BETWEEN GUIDELINES AND PRACTICE

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BACKGROUND

Tiny babies <= 27 weeks of gestation usually need the second dose of surfactant . Sometimes the practitioner looks at the baby, evaluates the status and decides, not always following the rules, to administrate the second dose despite an initial good response to the first dose.

Aim of the study was to evaluate the efficacy of the second dose of surfactant if the moment of administration is at least 12 hours after the first dose.

Material and methods

It is a prospective pilot case control study done in a III-d level NICU, in Romania. We evaluate three groups: one dose group (OD)24 cases – the babies receive 100mg/kg/dose of surfactant, guideline group (GG) 24 cases – received 2 or 3 doses according with the European guidelines for RDS from 2019 , and study group (SG) 31 cases – receive 2 doses , the second dose at 12 h after first one. The surfactant used was Curosurf and the dose was 100mg/kg/dose at least at each administration.

We evaluated FiO2 at day 1,2,3,7 of life, at 28 days and at 36 weeks post-conception. We quantified the duration of mechanical and non-invasive ventilation, and supplemental oxygen-therapy. We correlated with the neonatal mortality.

Results.

Means of gestational age (GA) were 25.54±1.547 weeks [OD group]; 26.325±1.659 weeks [GG] and 25.10±0.83 weeks [SG; p>0,05]. The mean birth weight were 835.42±169.655g [OD], 871.325±197.112 g [GG] and 752.655±25.10g [SG] with no statistical differences. The timing of the second dose of surfactant was at 32.987 h in the GG vs 12.328 h in the SG, with a tendency of significant difference (p=0.054).

The FiO2 decrease in all groups without statistical differences except at 28 days of life(Table 1).

The duration of respiratory support was not statistically different by the timing of a second dose of surfactant (p=0.453).

The neonatal mortality was not different by the timing of second dose administration.

Conclusion.

These are the intermediate results of our study. The research revealed the same decrease of FiO2 in all groups until 28 days of life. The duration of respiratory support was decreased but not statistically different.

A SECOND SURFACTANT DOSE - WHAT IS THE BEST STRATEGY BETWEEN GUIDELINES AND PRACTICE

Gabriela Zaharie, Melinda Matyas, Monica Hsmasanu , Tudor Drugan, Alexandru Zaharie , Adelina Tutu, Gabriela Caracostea, Valeria Filip, Muresan Daniel, Boris Kramer

Table 1. Dynamics of FiO2 in all groups

	GG	GG	OD	OD	SG	SG	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	
FiO2 -day 1	42,09	15,64	41,38	18,10	42,37	14,03	
FiO2-day 2	34,82	14,66	29,70	12,33	27,83	7,52	
FiO2-day3	37,10	15,47	31,43	15,51	33,29	18,51	
FiO2-day 7	29,26	14,36	26,50	6,96	29,07	17,35	
FiO2-day 28	21,92	2,56	24,17	4,13	32,87	15,16	P=0.015
FiO2-36 weeks post-concep-tional	24,86	4,81	24,80	8,50	28,00	9,06	

None declared

ID 0 - SEMI-QUANTITATIVE LUNG ULTRASOUND FOR EARLY PREDICTION OF BPD: A SISTEMAT-IC REVIEW AND META-ANALYSIS OF DIAGNOSTIC ACCURACY

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Background:
Lung ultrasound is a well-established diagnostic tool in neonatal critical care and it has been successfully applied to guide surfactant administration and respiratory support in the first hours of life. Recently, lung ultrasound has been investigated to predict BPD.

Methods:
To meta-analyze the diagnostic accuracy of classical ung Ultrasound Score (LUS; Brat. JAMA Pediatr 2015) calculated on 6 chest areas and its extended version (eLUS, on 10 chest areas) for the early prediction of BPD in preterm neonates. Studies were searched on various databases by matching the terms “bpd”, “broncho-pulmonary dysplasia”, “predicting”, “Lung Ultrasound Score”. Seven studies published between 2019 and 2021 were found and meta-analysis was performed ac-cording with PRISMA and QUADAS guidelines. (PROS-PERO n.CRD42021233010)

Results:
Seven studies (875 neonates) were meta-analyzed. LUS and eLUS showed a good diag-nostic accuracy to predict BPD at 7 and 14 days of life (AUC ranging between 0.75 and 0.86, pooled sensitivity 70-80%, pooled specificity 78-87%). Diagnostic accuracy of LUS and eLUS was not differ-ent at any time-point (AUC difference p > always 0.05). Analysis for moderate-to-severe BPD yielded similar results. Prenatal steroids, gestational age and sex did not influence diagnostic accuracy (p always>0.05).

Conclusions:
Lung ultrasound scores are generally accurate for an early prediction of BPD and moderate-to-severe BPD, in an average population of preterm infants </= 32 weeks’ gestation. The diagnostic accuracy is similar for LUS and eLUS, therefore the use of the simpler score should be advocated.

ID 577 - CHANGING FROM INSURE TO LISA AS THE PREFERRED METHOD OF SURFACTANT ADMINISTRATION DID NOT RESULT IN BETTER OUTCOMES IN A LEVEL III NICU

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Background:
According to European RDS guidelines, LISA is the preferred method of surfactant administration for spontaneously breathing infants on CPAP, but the evidence behind this recommendation has been questioned. Beginning in 2018, the level III NICU in Lund changed its policy from INSURE to LISA for surfactant administration to infants not already intubated and believed to be able to manage on CPAP after the procedure. We examined the effects of this policy change by comparing outcomes for 2016-2017 vs. 2018-2019.

Methods:
From the Swedish Neonatal Quality Register, we retrieved all NICU admissions of infants born in Lund before 35 weeks GA in the years 2016-2019. The study population consisted of the subgroup of infants treated with surfactant during their hospital stay. Baseline and outcome data were taken from the register, and patient charts were used to gather information on surfactant administration.

Results:
Out of 608 infants admitted, 238 (39%) received at least one dose of tracheal surfactant (Curosurf 200 mg/kg). Baseline characteristics were similar for surfactant-treated infants born in the first vs. the second period. Median gestational age was 26 weeks + 3 days (IQR 24+5 – 28+0). For LISA, atropine and fentanyl (2 µg/kg) was used as premedication. Out of 57 LISA administrations, complications were reported in 18 (32%). In 7 cases (12%), administration was not successful, and the infant had to be intubated for an immediate repeat dose. Following LISA, 25/57 (44%) infants needed intubation and mechanical ventilation within the first 24 hours. The chance of an infant avoiding mechanical ventilation was not significantly greater after LISA than after INSURE (44% vs. 37%, p=0.55). The introduction of LISA was associated with fewer surfactant-treated infants needing mechanical ventilation (77% vs. 89%, p=0.015), but this was offset by an increased need for a second dose (50% vs. 34%, p=0.01) and by significantly more laryngoscopy procedures. The incidence of pneumothorax, the total number of days on mechanical ventilation, days with extra oxygen, and oxygen treatment at 36 weeks PMA did not change, and there was no difference in incidence of other major morbidities.

Conclusion:
The introduction of LISA did not result in better outcomes.
None declared