ID: 105

TITLE: SURFACTANT REPLACEMENT THERAPY IN LATE PRETERM NEONATES WITH SEVERE RESPIRATORY DISORDERS. A RETROSPECTIVE COHORT COMPARATIVE STUDY

AUTHORS: O Ionov 1,2; E Kim 1; T Kosinova 1; Bezlepkina M.B 1; A Kirtbaya 1,2; E Balashova 1; A Ryndin 1,2; V Zubkov 1; D Degtyarev 1;2

AFFILIATIONS: 1 National Medical Research Center of Obstetrics, Gynecology and Perinatology named by V.I. Kulakov, Moscow, Russia
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CONTENT:

Surfactant replacement therapy in early preterm infants significantly improves outcomes and reduces mortality. However, the advisability of surfactant therapy for late premature newborns (gestational age 34-36 weeks) is not clearly defined. There is lack of available data about the effect of surfactant replacement on the outcomes, total duration of respiratory therapy, the use of mechanical ventilation, length of stay in neonatal intensive care unit (NICU) for this population.

71 newborns with gest. age of 34 - 35 weeks, admitted to NICU of National Medical Research Center of Obstetrics, Gynecology and Perinatology named by V.I. Kulakov from 2013 to 2015, who needed respiratory support from the first day of life and were stabilized on non-invasive resp support and then had a progression of respiratory disorders in the first day of life and met the criteria of failure: FiO2 > 0.4 and/or Silverman score ≥ 4 were included. Patients were divided into 2 groups. Group 1 (n=32) received INSURE with poractant alfa with initial dose of 200mg/kg when criteria of failure were met. Group 2 (n=39) were treated without surfactant. The length of stay in NICU, the duration of respiratory therapy, need for conventional mechanical ventilation and HFOV, outcomes were assessed.

Requirement for conventional mechanical ventilation in group 1 and group 2 did not differ significantly: 47% vs 59%, OR 0.652 [0.238; 1.692]. In the meantime, newborns from the second group (treatment without surfactant) significantly more often were in need of "hard" parameters (Mean airway pressure ≥ 12 cm H2O and FiO2 > 0.5) of conventional ventilation (6% vs 28%, p=0.0286) and therefore significantly more often required HFOV OR 0.17 [0.034; 0.85] without significant increasing the duration of respiratory therapy (Me: 88 vs 114 hours) and the length of stay in NICU (Me: 6 days in both groups). There was an absence of IVH, NEC, ROP, PDA and BPD in both groups. In group 2 the requirement of inotropes and/or vasopressors therapy was higher than in group 1 (31% vs 13%), although there were no statistically significant differences: OR0,322 [0,091; 1,137].

In our study surfactant therapy did not affect the need for conventional mechanical ventilation, the length of stay of newborns in NICU and main outcomes. Therefore the internal guide-line NICU of NMRCOGP n. by V.I. Kulakov does not provide the surfactant replacement in late preterm infants for routine use. Well-timed and correct HFOV in late preterm infants is a qualitative and cheaper alternative to surfactant therapy.

COI: None declared
ID: 167
TITLE: INTRAPATIENT VARIABILITY OF REPEATED RESPIRATORY MECHANICS MEASUREMENTS IN VENTILATED NEONATES
AUTHORS: Kamel Boudhar
AFFILIATIONS: Neonatal Intensive Care unit / Central hospital of army / Kouba Algeria

CONTENT:

The measurement of respiratory mechanics in newborn has been used to understand the pathophysiology of respiratory failure and describe the effects of medications such as the exogenous surfactant. Sleep state and position influence the measurements of lung function and contribute to their variability. Information about the intrapatient variability of pulmonary function measurements is of clinical importance because a large variability in the test results would preclude their use in the management of individual patients.

The aim of this study was to describe the intrapatient variability of repeated respiratory mechanics measurements in ventilated neonates.

Flows were measured through a pneumotachometer placed between the endotracheal tube and the ventilator circuit. we studied 100 healthy term neonates with 10 pulmonary mechanics measurements to determine the intrasubject variability of repeated measurements.

The coefficient of variation for these 100 subjects ranged from 4% to 29% for tidal volume; 2% to 15% for dynamic compliance, and 2% to 14% for pulmonary resistance. The intrapatient variability in respiratory mechanics parameters was lower in the controlled ventilation mode than in the assisted mode (2% vs. 8.5%). The choice of controlled cycles by suppressing spontaneous cycles reduce this variability, in our study, it was 0.8% for compliance and resistance.

The high variability of the measurement of respiratory mechanics in spontaneously breathing newborns infants may reduce the clinical usefulness of this for individual patients’ measurements during mechanical ventilation.

COI: None declared
ID: 168
TITLE: COMPARISON OF DYNAMIC AND STATIC MEASUREMENTS OF COMPLIANCE IN MECHANICALLY VENTILATED NEWBORN INFANTS
AUTHORS: Kamel Boudhar
AFFILIATIONS: Neonatal Intensive Care unit / Central hospital of army / Kouba Algeria

CONTENT:

Respiratory Mechanics measurements are helpful to assess the severity of lung disease, effectiveness of ventilatory support, in the management of infants with respiratory failure and in the follow-up of infants with chronic lung disease. The two most common methods used in intubated infants are the dynamic and the single or multiple occlusion techniques for measuring of passive mechanics. The aim of this study was to compare compliance measured by a dynamic technique with those obtained by a multiple occlusion technique in ventilated newborn infants.

Flows were measured through a pneumotachometer placed between the endotracheal tube and the ventilator circuit. Static compliance is calculated as the VT divided by the pressure required: \( CRS = \frac{VT}{(P_{plat} - PEEP)} \). The calculation was done by the double occlusion technique at the end of inspiration and at the end of expiration. An average of 5 measurements were calculated, and to stabilize the breathing after each occlusion, a minimum of 5 breaths was observed. These values were compared with dynamic respiratory system compliance (\( C_{dyn} \)) on the same ventilator settings.

80 newborns were studied
Mean static compliance was significantly higher than mean dynamic compliance (1.84 vs 0.82 mL/cm H2O/kg with \( p<0.0001 \)).

The values measured by the passive technique are higher than those obtained by the dynamic technique.

COI: None declared
ID: 229

**TITLE:** RELATION BETWEEN ESOPHAGEAL PRESSURE, VOLUME AND THE ACTIVITY OF THE DIAPHRAGM IN A PRETERM INFANT, A PHYSIOLOGICAL STUDY

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**CONTENT:**

Respiratory support is used in preterm infants to restore lung function and reduce the work of breathing (WOB). Measuring WOB requires invasive measurement of transpulmonary pressures combined with (spontaneous) tidal volumes. Therefore, clinicians use parameters like respiratory rate and distress, to assess WOB. A non-invasive method to measure WOB is lacking. Transcutaneous electromyography of the diaphragm (dEMG) has shown to be able to detect changes in diaphragm activity when changing respiratory support, which could reflect changes in WOB. In a search for a new WOB method this study describes the relation between esophageal pressure, tidal breathing and diaphragm activity in a preterm infant.

Esophageal pressure (Pes), volume and dEMG were recorded simultaneously in a preterm infant (gestational age 29.9 weeks, measured at day five, with a weight of 1115 grams) while supported by nasal continuous positive airway pressure of 4 cmH2O, without supplemental oxygen. Pes was measured with a fluid-filled feeding tube, retracted into the esophagus and connected to a pressure transducer. Volume was measured with respiratory inductance plethysmography (RIP), calibrated to tidal breathing measured at the airway opening using a flow transducer. dEMG was recorded by three skin electrodes placed on the infant’s chest. Breath-by-breath analysis of a segment resulted in an average respiration loop (based on 57 breaths) of the relation between dEMG activity changes and volume and Pes changes.

With the current measurement set-up it was feasible to retrieve, Pes, volume and dEMG tracings simultaneously in a preterm infant. RIP-calibration could be done with moderate accuracy (R2 multiple regression fit of volume vs. RIP 0.83). The EMG-pressure loop showed a pressure drop swiftly at the start of the diaphragm’s contraction and an increase in pressure during expiration, when the diaphragm relaxes again (Figure 1A). The dEMG-volume loop showed a physiological ramp inspiratory activity of the diaphragm before actual inspiratory volume was measured (Figure 1B). The median ramp inspiratory activity time of the diaphragm was 194 (246-152) ms. Post-inspiratory activity of the diaphragm was seen as well indicating an active process to maintain end-expiratory lung volume.

This study describes the expected physiological relation between the electrical activity of the diaphragm and the esophageal pressure and volume respectively. Based on these results dEMG seems a promising candidate for non-invasive WOB monitoring in preterm infants.

**IMAGES:**

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Figure 1: dEMG – pressure (A) and dEMG – volume (B) loops showing the relation between these parameters. Inspiration and expiration were analyzed separately. dEMGRIA: ramp inspiratory activity of the diaphragm, dEMGPIA: post-inspiratory activity, TV: tidal volume, dEMGamp: breathing amplitude, dEMGtonic: tonic end-expiratory activity of the diaphragm, dEMGpeak: peak activity.

**COI:** None declared
ID: 361

TITLE: TREATMENT OF PRETERM INFANTS WITH SEVERE RESPIRATORY FAILURE AND PULMONARY HYPERTENSION: THE SAFETY AND EFFICACY OF NITRIC OXIDE THERAPY

AUTHORS: Simona Negro 1, Sara Cecchi 1, Caterina Coradeschi 2, Martino Landi 2 and Barbara Tomasini 1

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2 Paediatric Residency School, University Hospital of Siena, Siena, Italy.

CONTENT:

The incidence of persistent pulmonary hypertension of the newborn (PPHN) is 5.4 per 1000 live births in premature infants, determining high mortality and morbidity, such as refractory hypoxic respiratory failure (HRF). Inhaled nitric oxide (iNO) has been showed to improve oxygenation, lowering pulmonary vascular resistance and improving lung flow, in term babies; but it cannot be recommended for the routine treatment of HRF in premature infants, due to the absence of guidelines and the high risk of bleeding. The aim of the study was to evaluate the efficacy of iNO treatment in preterm newborns affected by HRF and PPHN, and its safety.

All newborns born ≤32 weeks of gestation between 2015-2018, who developed HRF (FiO2>0.40-0.50, PaO212 cmH2O) with or without PPHN, were retrospectively enrolled. SatO2/FiO2, Oxygenation Index (OI) and echocardiography were used for the diagnosis of PPHN. Infants with congenital anomalies, hydrops and those who died soon after birth, were excluded. Clinical characteristics and outcomes of infants with HRF responsive to conventional treatments (Not Treated Group) and those of newborns with HRF not responsive to common therapies and who developed PPHN with the need of iNO (Treated Group), were compared. Effectiveness of iNO was evaluated by recording changes of MAP (mean airway pressure), FiO2, SpO2/FiO2 and OI before, and 3±1, 6±1, 12±3, 24±6, 48±6 and 72±12 hours after beginning therapy.

Among 157 newborns enrolled, 13 developed HRF not responsiveness to conventional therapies and were treated with iNO [mean (SD) age at the beginning of iNO: 10 (9) days]. The Treated Group showed a lower gestational age, birth weight and Apgar score, a higher FiO2 in delivery room and a higher frequencies of gestosis and intrauterine growth restriction during pregnancy, compared to Not Treated Group (p<0.05). iNO significantly improved oxygenation after 6-8h of treatment in all cases (Fig.1). No significant deterioration of intraventricular haemorrhage (IVH) was observed during treatment. A worse respiratory outcome, a reduced hemodynamic stability, a later close of patent ductus arteriosus, a higher incidence of necrotizing enterocolitis, retinopathy of prematurity, IVH and major mortality rate were observed in the Treated Group compared to the Not Treated Ones (Chi-square, p<0.05).

Preterms with HRF and PPHN respond to iNO administration, without increasing the risk of major intracranial bleeding. Their worse outcome could be related to their critical condition at birth and to the late beginning of iNO, as rescue therapy. iNO is not recommended for the routinely treatment of PPHN in preterms, but it should be considered carefully since, improving oxygenation, may reduced mortality and morbidity of subjects at risk.

IMAGES:
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Figure 1. Changes in FiO2 (A), OI (B), SatO2 (C), SatO2/FiO2 (D) before and after iNO treatment in the Treated Group

COI: None declared
ID: 368

TITLE: DEMOGRAPHIC CHARACTERIZATION AND CARE OF PREGNANT WOMEN WITH PRE-ECLAMPSIA AND THEIR NEWBORNS IN A REFERENCE CENTER IN THE SOUTHERN REGION OF BRAZIL

AUTHORS: Paulo de Jesus Hartmann Nader 1,2; Silvana Salgado Nader 1,2; Nance Nardi 1; Lindolfo Meirelles 1; Melissa Camassola 1; Augusta Harff 2

AFFILIATIONS: 1. Pediatric Dept, .Universidade Luterana do Brasil, Canoas ,RS, Brazil
2. University Hospital, Canoas ,RS, Brazil

CONTENT:

Preeclampsia (PE) is a specific syndrome of pregnancy with a global action ranging from 3 to 5%. PE is the major causes of fetal and maternal mortality and morbidity, being one of the main causes of prematurity. In the United Kingdom there was a reduction of more than 90% of maternal mortality with the control of the disease in prenatal care and at the time of termination of pregnancy. With the short-term and long-term risks inherent to PE during pregnancy, in the newborn and in the mother, it is necessary to decide the best time to interrupt gestation because the healing process occurs through the withdrawal of placenta. Because PE is a disease associated with inflammatory etiology, the effects on the newborn can also occur, since the circulating factors in the pregnant woman can reach the fetus. There is a higher incidence of bronchopulmonary dysplasia, cerebral lesions such as stroke and developmental deficit. It is important to know the result obtained in the pregnant women with PE as well as the birth conditions of these infants in order to better evaluate the results of the management, as well as to identify the risk factors involved in the disease, in order to plan possible preventions.

Retrospective, cross-sectional study. To characterize the population of pregnant women with preeclampsia (PE) in relation to risk factors and newborns' birth conditions for neonatal asphyxia and fetal nutrition status. The cases (162 patients) corresponded to all births diagnosed with PE in the years 2016 and 2017. The maternal variables were demographic data, obstetric gestational age, number of pregnancies, type of delivery, previous hypertensive disease, PE, restricted intrauterine growth, preterm birth, blood pressure at birth. The newborns variables were Apgar: 1st and 5th minutes, birth weight, adequacy of weight for gestational age. Student's t-test and chi-square test were applied. Significance level was considered p <0.05.

The incidence of PE in pregnant women was 2.3% with an average mother’s age above 30 years. Preterm delivery had an incidence of 43.3%, with 19% of late preterm infants. Newborns small for gestational age (SGA) corresponded to 23.6% of mothers with PE. There were no differences between the groups, in relation to being primiparous. Regarding birth weight, the PE sample showed a mean weight 400 g lower when compared to the control group (p <0.001). The SGA were 23.6% of the sample in the PE group (p <0.001). In the PE group there were 2 deaths due to fetal loss. The 162 PE postpartum women, 67 (41.3%) were hospitalized for the management and follow-up of PE. There was no difference in relation to ethnicity when comparing the 2 groups. Patients group not follow at high-risk hospitalization had a higher number of SGA, premature babies and apgar score below 7 in the first minute (p <0.001).

The prevalence of PE was 2.3% in pregnant women in HU Canoas, with a mean mother’s age above 30 years. The most severe cases were responsible for newborns with gestational age less than 34 weeks and birth weight less than 1,000 g. Apgar score below 5 in the fifth minute was found in 2.5% of mothers with PE. Monitoring PE during pregnancy reduces the risk of fetal malnutrition and perinatal asphyxia.

COI: None declared
ID: 624

**TITLE:** PLASMA B-TYPE NATRIURETIC PEPTIDE LEVELS: ASSOCIATED WITH ONLY HEMODYNAMICALLY SIGNIFICANT PATENT DUCTUS ARTERIOSUS, NOT PERINATAL FACTOR IN INFANTS WITH RESPIRATORY DISTRESS

**AUTHORS:** Jaewook Ha 1; Heekwon Son 2; Mi-ji Lee 3; Eui Kyung Choi 4; Jinwha Choi 5; Jeonghee Shin 6; Byung Min Choi 7

**AFFILIATIONS:** Paediatric Dept., Korea University ANSAN Hospital, Ansan, Gyeonggi-do, Republic of Korea

**CONTENT:**

Plasma B-type natriuretic peptide (BNP) levels were used as a biomarker for the prediction and diagnosis of hemodynamically significant patent ductus arteriosus (HS-PDA) in preterm infants. Various perinatal factors are suspicious to affect the plasma BNP levels after birth, but these associations have not been clarified in the literature. The aim of study is to evaluate the association of the perinatal factors and hospital outcomes with early plasma BNP levels in infants with respiratory distress.

Plasma BNP levels on 24/48 hours after birth were measured in 153 infants with respiratory distress, with mean gestational age (GA) of 32.0 weeks and birth weight of 1,924 g. The effects of perinatal factors and hospital outcomes on the plasma BNP levels were analyzed statistically.

In univariate analysis, plasma BNP levels on 24 hours after birth were significantly correlated with birth weight, respiratory distress syndrome (RDS), and HS-PDA and those on 48 hours after birth were significantly correlated with GA, birth weight, out-born delivery, Cesarean section, Apgar score at 1/5 minute, RDS, HS-PDA, and bronchopulmonary dysplasia. However, in multivariable analysis, there is no significant perinatal factor affecting on plasma BNP levels on both 24/48 hours after birth. HS-PDA is the only hospital outcome affected by plasma BNP levels on both 24/48 hours after birth (p <0.0001, respectively).

Perinatal factors of infants with respiratory distress do not affect plasma BNP levels after birth. Among the hospital outcomes, HS-PDA is the single most significant factor associated with plasma BNP levels after birth. Thus, early plasma BNP levels could be used as an appropriate predictive biomarker for HS-PDA in infants with respiratory distress.

**COI:** none declared
ID: 676

TITLE: MOLECULAR GENETIC ASPECT OF TANATOGENESIS IN A PREMATURE NEWBORN WITH SEVERE RESPIRATORY DISTRESS SYNDROME

AUTHORS: M. Artsiusheuskaya1 A. Mikhalenka2, O. Malyueva2, G. Shishko1, A. Sukharava1, G. Kulakova3, N. Sitnik3, A. Kilchevsky2.

AFFILIATIONS: 1 Belarusian Medical Academy of Post-Graduate Education, Minsk, Belarus
2 Institute of Genetics and Cytology of NASB, Minsk, Belarus
3 Clinical Maternity Hospital of Minsk region, Minsk, Belarus

CONTENT:

The preterm birth rate was about 4% of infants born in Belarus in 2018 year. The risk of death in the neonatal period in premature infants is 20 times higher than in full-term newborns. Therefore reducing infant mortality is one of the most important tasks of neonatology. Molecular genetic predictors determining the severity of the progression of the disease are currently under discussion.

The preterm male baby C. was born at 28–29 weeks gestation from the second pregnancy complicated by intrauterine growth restriction. The obstetric history showed that the first pregnancy ended with a fetus death at 20–21 weeks gestation. The baby C. was born by emergency caesarean section. His weight was 770 g (3rd to 10th centile), length - 34 cm (3rd to 10th centile), head circumference - 24 cm (3rd to 10th centile).

The infant suffered from severe respiratory distress syndrome at birth, which required intubation and surfactant administration. From the second day of life the respiratory failure and ventilator parameters increased, and the need for oxygen reached 100%.

Laboratory analysis revealed leucopenia and severe thrombocytopenia. On the third day of life hemorrhagic syndrome appeared in the form of gastric and repeated pulmonary hemorrhages. The newborn developed disseminated intravascular coagulation and resistant shock.

The infant received antibacterial, inotropic therapy, correction of thrombocytopenia. The child’s condition progressively worsened and he died at the age of 5 days.

Analysis of the proband DNA was performed using the Illumina TruSight One sequencing panel on the MiSeq platform (Illumina, San Diego, CA). FASTQ files were received in the Basespace automated digital cloud of the sequencer manufacturing company. The alignment of the data on the reference genome and the identification of variants were performed using the Illumina DRAGEN platform (Dynamic Read Analysis for GENomics). VCF file was annotated by the wANNOVAR, Variant Studio and Variant Interpreter. Filtering of variants was executed according to the frequency of occurrence of an alternative variant (≤ 0.5%) in the 1000G, ExAc, gnomadGenome, gnomadExome databases; functional assessment of the exon variant, homo- or heterozygosity of the variant, and according to the prediction of the possible pathogenicity of the variant (SIFT, PolyPhen2, MutationTaster).

Pathogenic and probably pathogenic variants found in investigated sample are presented in table № 1. Sequence analyses revealed the presence of a pathogenic variant in exon 9 of the C8B gene (c.1282C>T/p.Arg428*6 NM_000066) responsible for complement component 8 deficiency, atypical immune response and very rare primary immunodeficiency. Also, a heterozygous variant in exon 5 of the LYST gene (c.T1334G/p.F445C, NM_000081), not described earlier, was detected in the infant. This missense-variant is “possibly pathogenic” according to pathogenicity prediction algorithms. Homozygous mutations in LYST are associated with some primary immunodeficiency diseases, thrombocytopenia and coagulation disorders. Two heterozygous probably pathogenic variants were found in the HYDIN gene (p.Arg2298Gly, p.Asn724Asp).

Homozygous and compound heterozygous mutations in HYDIN are associated with respiratory insufficiency, chronic wet cough, chronic bronchitis, chronic rhinosinusitis, bronchiectasis. These two variants require confirmation of the compound heterozygosity.
The described variants require further study and confirmation of their pathogenicity. It is also required to carry out genetic testing and clinical examination of the parents of the proband for further prenatal diagnosis.

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COI: None declared
ID: 703

TITLE: CLINICAL AND GENETIC ASPECTS OF RESPIRATORY DISTRESS SYNDROME IN PREMATURE NEWBORN

AUTHORS: Anastasiya Sukharava 1; Georgy Shishko 2; Marina Artsiisheuskaya 3; Alena Mikhalenka 4, Volha Malyshava 5; Inna Valentsiukevich 6; Vanda Adasko 7

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CONTENT:

Polymorphic variants of genes encoding surfactant proteins A, B, C, D (SFTPА, SFTPB, SFTPС, SFTPD), vascular endothelial growth factor (VEGF) can result in pulmonary morbidity in newborn infants (M. Somaschini, 2017; M. Tsitoura, 2016). The changes in the activity of xenobiotic biotransformation enzymes (MDR1, NAT2) and antioxidant system (GSTP1) associated with the presence of genetic polymorphism can lead to an increased susceptibility of the organism to adverse effects and, as a consequence, to an increased risk of respiratory diseases (A. Hadchouel et all, 2008; N. Ambalavan, 2009).

The preterm male baby V. was born at 29–30 weeks gestation from the second pregnancy complicated by intrauterine growth restriction. The first pregnancy ended in term with a normal delivery. The baby C. was born by emergency caesarean section. His weight was 750 g (3rd to 10th centile), length - 33 cm (less than 3rd centile), head circumference - 25 cm (3rd to 10th centile).

The infant suffered from severe respiratory distress syndrome at birth, which required intubation and surfactant administration (poractant alfa 160 mg/kg), mechanical ventilation during 2 days and NCPAP 1 day. Laboratory analysis revealed anemia, hyperglycemia. No signs of inflammatory process were detected.

In the dynamics the child’s condition worsened because of respiratory failure requiring oxygen and hormone therapy. The severe course of respiratory disorders in the neonatal period was complicated by bronchopulmonary dysplasia and pulmonary hypertension with prolonged oxygen dependence (more than 5 months). The patient had 3 episodes of viral infection within 5 months of hospitalization.

The patient molecular analyses was performed on genomic DNA extracted from venous blood. Polymorphisms of surfactant proteins genes were detected using direct sequencing method. Polymorphisms of xenobiotic biotransformation enzymes genes were detected using polymerase chain reaction (PCR). The results is shown in Fig. 1.

From catamnesis is known that our patient had several severe episodes of viral infection after hospital discharge which were accompanied by oxygen dependence and hospitalization in NICU (twice). The patient V. is 2 years old now. He has signs of fibrosis in the x-ray of the lung and needs hormone inhalation therapy. No signs of pulmonary hypertension are detected.

Polymorphisms detected by molecular genetic analysis in SFTPB (intron 4, promoter area), SFTPА (exon 3) can be the markers of the severity of respiratory disorders in this patient.

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Fig.1 Molecular genetic analysis of the surfactant proteins complex, xenobiotics biotransformation enzymes and the antioxidant system, vascular endothelial growth factor of the child V.
COI: None declared
Effect of an extubation readiness test protocol at a tertiary care fully outborn neonatal intensive care unit

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N=589 (n=294 Group 1, n=295 Group 2) were included (pre-term subgroup: n=42 Group 1, n=38 Group 2). For all patients, extubation failure decreased significantly from 9.9% to 4.1% (p=0.006); Group 1 patients were over 2.5 times more likely to experience extubation failure compared to Group 2. Extubation failure in the pre-term subgroup decreased from 21.7% to 2.6% (p=0.01); Group 1 patients were 11 to 14 times more likely to experience extubation failure. Median DOI was similar in both groups for all patients and in the pre-term subgroup.

A unique two-stage ERT protocol was effective at reducing extubation failure rate, without increasing DOI, largely in pre-term infants. The evidence-based, interprofessionally developed ERT protocol, and its integration into the NICU culture largely contributed to its success.
ID: 732

**TITLE:** PREDICTORS OF EXTUBATION FAILURE IN PRETERM INFANTS AT A TERTIARY CARE NEONATAL INTENSIVE CARE UNIT

**AUTHORS:** Hilal Al Mandhari 1; Buthina Al Riyami

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**CONTENT:**

Mechanical ventilation is considered as standard life-supporting intervention that is often used in the respiratory care of preterm infants in NICUs. Despite the fact that this intervention has played a major role in saving preterm infants’ lives, the challenge that concerns neonatologists around the world is extubation failure (EF) which repetitively occurs due to the absence of accurate specific criteria that determines extubation readiness. The aim of this study was to determine EF rate among intubated preterm infants (<36 6/7 weeks) admitted to Sultan Qaboos University Hospital NICU and determine the risk factors associated with EF among the studied group.

Charts of all intubated preterm infants (<36 6/7 weeks gestation) who were admitted to SQUH NICU from January 2013 to December 2017 were retrospectively reviewed. Extubation failure was defined as the need for re-intubation within 7 days of extubation. Demographic data, ventilation parameters, BG values and different possible risk factors of EF were collected. Statistical analysis was done using SPSS version 23.

A total of 190 infants were intubated in the study period from which 50 were excluded for various reasons and 140 were eligible for the study. Out of which, 106 had successful extubation while 34 failed extubation (24.3%). The diagnosis of PDA (p value 0.018), GA <28 weeks (p value 0.029) and lower 1-minute APGAR score (p value 0.023) were significantly associated with extubation failure. Moreover, lower pH (p value <0.001) and HCO3- (p value <0.001) 1 hour after extubation were significantly associated with EF.

Extubation failure rate in preterm infants admitted at SQUH NICU is within reported international rates. Risk factors for extubation failure include PDA, GA <28 weeks, lower 1-minute APGAR score as well as low acid-base balance after extubation. The presence of such factors needs to be taken in consideration prior extubation of such preterm infants.

**COI:** None to declare
ID: 988

TITLE: A RETROSPECTIVE REVIEW OF ENDOTRACHEAL TUBE FIXATION METHODS IN A TERTIARY NEONATAL INTENSIVE CARE UNIT

AUTHORS: Lucy E Geraghty 1; Jennifer M Geraghty 2; Deirdre Sweetman 3; John Coveney 4

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CONTENT:

In December 2017 our neonatal intensive care unit (NICU) was obliged to change the fixation device used to secure endotracheal tubes (ETTs) from device A to device B due to a cessation of manufacture of the former. Following this change, NICU staff perceived an increase in unplanned extubations. We hypothesised that the new fixation device may have a role in these unplanned extubations. We undertook a retrospective review comparing unplanned extubation rates in a cohort of patients who were intubated in our NICU with Device A versus Device B. Our primary aim was to determine if the new fixation device was a contributing factor leading to unplanned extubations and emergency re-intubations.

We conducted a retrospective chart review of all patients in our NICU who were intubated over a period of 16 months of April 2017 – August 2018, excluding those intubation events in the month of December 2017 when devices were transitioned. We collected data related to all intubation events over both time periods, including demographical details of patients, data from the time of the actual intubation events and the rate of unplanned extubations. We also sought to clarify the nature and circumstances of these unplanned extubations with a view to improving the quality of care in our NICU.

Our primary outcome measure was self-extubation.

We examined a total of 206 intubation events.
We divided our cohort into 2 groups;
- Group A: Intubated using Device A in the 8 months of April–November 2017 inclusive
- Group B: Intubated using Device B in the 8 months January–August 2018 inclusive.

We discovered a significant difference between self extubation rate in group A (4/99) versus group B (17/85) with a Pearson chi-squared value of 9.108 and a p-value = 0.003

Regarding the gender breakdown = See Table B
Outcome breakdown = See Table C
Outcome compared between group A versus group B = Table D
No significant difference was found (chi-squared test p-value = 0.399)- see Bar Chart A
Self extubation Rate in group A versus group B = Table E- see Bar Chart B

An increase in the number of unplanned extubations occurred in the period following the introduction of the new fixation device. This device, while more economical and easier to apply may play a significant role in neonatal unplanned extubations. There is an urgent need to examine the efficacy of available fixation devices for neonates. We plan to continue to audit these devices as their use may be negatively impacting neonatal airway management.

IMAGES:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=91893f9dbdb47ac40c4dbafbec674d30-MjAxNz0wNSM1Y2UvNjYyZDQyNjgx

Results Tables
COI: None declared