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Abstracts

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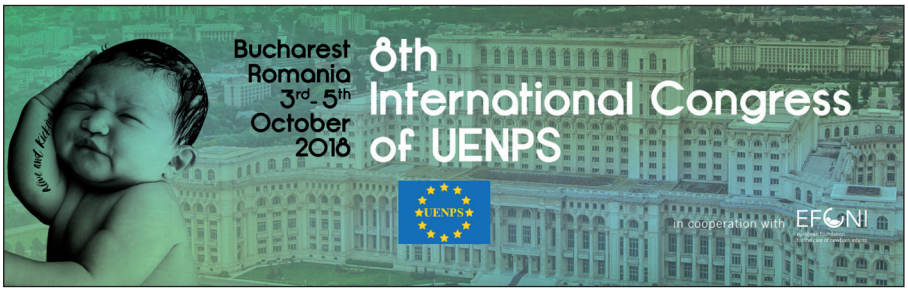

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ABS 1

PROPHYLACTIC VERSUS SELECTIVE USE OF SURFACTANT IN PRETERM INFANTS BORN AT LESS THAN 30 WEEKS GESTATION OR WITH BIRTH WEIGHT LESS THAN OR EQUAL TO 1,250 GRAMS IN KOREA: KOREAN NEONATAL NETWORK

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INTRODUCTION

Surfactant therapy is widely used to prevent or treat respiratory distress syndrome (RDS) in preterm infants. Prophylactic use, the administration of surfactant without a diagnosis after birth, is favored in infants at risk of RDS for good outcomes. However, selective use, the administration of surfactant after diagnosis of RDS, has been recently recommended for reducing unnecessary use of surfactant in preterm infants. We investigated the effectiveness of prophylactic and selective use of surfactant in preterm infants born at less than 30 weeks gestation or birth weight (BW) of less than 1,250 grams in Korea.

METHODS

This was a retrospective study of 4,425 infants born from January 2013 to December 2015 registered in the Korea Neonatal Network database. Prophylactic use (P) group (n = 3,158) and selective use (S) group (n = 1,267) was matched with similar propensity score (gestational age, BW and antenatal steroid use). Primary outcomes were mortality and bronchopulmonary dysplasia (BPD). Other morbidities before discharge were also analyzed. Subgroup analysis was performed according to gestational age, BW and antenatal steroid use.

RESULTS

We analyzed 1,017 infants in each group after matching. 23.6% of infants in the selective use group did not receive surfactant. The number of newborns treated with surfactant was 0.97 ± 0.7 in the S group and 1.29 ± 0.6 in the P group ($p < 0.001$). In the S group, mortality before discharge (OR 1.55, 95% CI: 1.13-2.11, $p = 0.006$) and the incidence of BPD (OR 1.75, 95% CI: 1.41-2.18, $p < 0.001$) were significantly higher than in the P group. Subgroup analysis by gestational age showed no significant differences in mortality before discharge in infants with more than 28 weeks' gestation and in the incidence of BPD in infants with more than 30 weeks' gestation between the S and P groups. There was no difference in results in subgroup analysis by BW. In infants exposed to complete antenatal steroids, there was no difference in mortality before discharge between the S and P groups. There were no significant differences in other morbidities between the S and P groups.

CONCLUSIONS

In preterm infants at risk of RDS, prophylactic use of surfactant prevents mortality before discharge and BPD. However, selective use of surfactant may be applied clinically to avoid unnecessary use of surfactant without increasing mortality and BPD in infants with more than 30 weeks' gestation and complete antenatal steroid use.

ABS 2

ANTENATAL STEROIDS TREATMENT AND RESPIRATORY OUTCOMES IN PRETERM INFANTS

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INTRODUCTION

Antenatal steroids (ANS) administration to women at risk of preterm birth is associated with a reduction in neonatal death, respiratory distress syndrome, cerebroventricular haemorrhage and necrotizing enterocolitis [1]. The majority of RCTs included infants born between 28-34 weeks GA and benefits of ANS have been extrapolated to extremely preterm fetuses (less than 28 w GA) without clear evidence. The aim of the study is to evaluate the impact of

Table 1 (ABS 2). Characteristics of the newborns who received prenatal steroids (complete course).

Prenatal steroids (complete course), n = 615		Yes	No	p
GA median (SD)		28.69 (2.199)	27.93 (2.58)	< 0.001
< 26 w GA		54 (46.2%)	62 (52.4%)	
Placental histology	Normal	13 (24.1%)	13 (21%)	0.342
	No analyzed	5 (9.3%)	9 (14.5%)	
	Inflammatory	30 (55.6%)	27 (43.5%)	
	Vascular disease	6 (11.1%)	13 (21%)	
MV		592.07 (612)	507.88 (731)	0.509
• First 3 days		42 (77.8%)	59 (93.7%)	0.034
• After first 3 dol		11 (20.4%)	3 (4.8%)	
• No MV		1 (1.9%)	1 (1.6%)	
Nosocomial sepsis		42 (77.5%)	36 (57.1%)	0.020
Mortality		21 (38.9%)	36 (57.1%)	0.049
SF-BPD 2-3		17 (31.3%)	5 (7.9%)	0.002
SF-BPD 3		26 (48.1%)	19 (30.2%)	0.057
26-29 w GA		143 (64.7%)	78 (35.3%)	
Placental histology	Normal	34 (30.8%)	24 (23.8%)	0.033
	No analyzed	24 (16.8%)	22 (28.2%)	
	Inflammatory	43 (30.1%)	12 (15.4%)	
	Vascular disease	42 (29.4%)	20 (25.6%)	
MV		269.88 (805.2)	255.54 (436)	0.885
• First 3 days		57 (39.9%)	48 (60.8%)	0.007
• After first 3 dol		38 (26.6%)	10 (12.7%)	
• No MV		48 (33.6%)	21 (26.6%)	
Nosocomial sepsis		82 (57.3%)	51 (64.6%)	0.319
Mortality		12 (8.4%)	9 (11.4%)	0.48
SF-BPD 2-3		83 (58%)	56 (70.9%)	0.062
SF-BPD 3		118 (82.5%)	65 (82.3%)	1.0
29-32 w GA		191 (68.7%)	87 (31.3%)	
Placental histology	Normal	54 (28.3%)	17 (19.5%)	0.127
	No analyzed	58 (30.4%)	37 (42.5%)	
	Inflammatory	25 (13.1%)	14 (16.1%)	
	Vascular disease	54 (28.3%)	19 (21.8%)	
MV		38.6 (123)	46.2 (120)	0.631
• First 3 days		43 (22.5%)	25 (28.7%)	0.346
• After first 3 dol		7 (3.7%)	5 (5.7%)	
• No MV		141 (73.8%)	57 (65.5%)	
Mortality		4 (2.1%)	5 (5.7%)	0.144
Nosocomial sepsis		59 (30.9%)	24 (27.6%)	0.672
SF-BPD 2-3		167 (87.4%)	78 (89.7%)	0.692
SF-BPD 3		184 (96.3%)	81 (93.1%)	0.237
SF-BPD 2-3 (males)		145 (67.1%)	86 (59.7%)	0.178
SF-BPD 2-3 (females)		122 (70.9%)	53 (62.4%)	0.200
SF-BPD 3 (males)		185 (85.6%)	100 (69.4%)	< 0.001
SF-BPD 3 (females)		143 (83.1%)	65 (76.5%)	0.238
Mortality (males)		16 (7.4%)	37 (25.7%)	< 0.001
Mortality (females)		21 (12.2%)	13 (15.3%)	0.558
Logistic regression (adjusted for GA, placental histology, gender)		**OR**	**95% CI**	**p**
Mortality (no antenatal steroids)	Male	3.483	1.686-7.194	0.001
	Female	0.623	0.259-1.502	0.292
SF-BPD (2-3)	Less than 26 w GA	5.330	1.812-15.679	0.002
	• Male	32.565	3.445-307.842	0.002
	• Female	1.023	0.217-4.832	0.977
	26-29 w GA [a]	0.478	0.256-0.892	0.020
	29-32 w GA	0.803	0.357-1.808	0.695
SF-BPD 3	Male	1.996	1.090-3.655	0.025
	Female	0.663	0.275-1.595	0.358
MV first 3 dol (no antenatal steroids)		2.004	1.366-2.941	0.001

[a] Placental histology acts as an interaction factor.

MV: mechanical ventilation; SF-BPD 2-3: survival without moderate-severe bronchopulmonary dysplasia; SF-BPD 3: survival without severe bronchopulmonary dysplasia.

antenatal steroids treatment (two bethametasone 12 mg dose in 48 h) on mortality rates, mechanical ventilation requirement, mortality and BPD outcome in preterm infants.

METHODS

Observational study including all preterm infants born with less than 32 weeks GA admitted to our institution from January 2012 to December 2017. Perinatal data (GA in weeks, gender, complete course of antenatal corticosteroids, placental histology) and mechanical ventilation (MV) requirement were recorded. The diagnosis of BPD included type 2-3 by physiologic definition [2] and survival was considered at discharge.

RESULTS

615 preterm infants were admitted to our institution during this period. Perinatal characteristics according to ANS treatment are set out in **Tab. 1**. When adjusted for perinatal factors, ANS reduce MV in the first 3 days after birth (lack of ANS increases MV [OR 2.004, 95% IC 1.366-2.941, p 0.001]). There is also a reduction in mortality rates with an increase in survival without severe BPD (SF-BPD 3) in males. In extremely preterm infants (less than 26 w GA), ANS increase survival without moderate-severe BPD (SF-BPD 2-3) (OR: 5.330, 95% CI 1.812-15.679). In contrast, ANS in preterm infants born with 26 to 29 weeks GA is associated with a decrease in SF-BPD in cases of normal placental histology (no significant differences in the other groups).

CONCLUSION

The impact of ANS treatment on survival and respiratory outcomes depends on fetal sex, placental histology and gestational age being extremely preterm (less than 26 weeks GA); male infants benefited the most.

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ABS 3

COMPARISON OF THREE NATURAL SURFACTANTS ACCORDING TO LUNG ULTRASONOGRAPHY SCORES IN NEWBORNS WITH RESPIRATORY DISTRESS SYNDROME

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INTRODUCTION

Lung ultrasonography (LUS) is a non-invasive bedside test, increasingly used by clinicians for the early recognition of respiratory disorders in newborns. Recently, LUS scores have been proposed to evaluate surfactant need and oxygenation in newborns with respiratory distress syndrome (RDS). In this study, we aimed to compare the results of three natural surfactants according to LUS scores in premature infants with RDS.

METHODS

This was a prospective study carried out on 48 preterm infants (25-34 weeks) with RDS and receiving surfactant according to the 2016 European guidelines. All patients underwent clinical evaluation and chest X-ray at three study points; postnatal 1st h (presurfactant), 6-12th h (early postsurfactant) and 24th h (late postsurfactant). Simultaneously fraction of inspired oxygen (FiO_2) need, Downes and lung USG scores were noted. The patients were randomized into three groups; Group 1 (n = 18), poractant alfa; Group 2 (n = 16), beractant; and Group 3 (n = 14), calfactant. The groups were compared according to clinical variables as well as FiO_2 need, Downes and LUS scores.

RESULTS

Gestational age (p = 0.37), birthweight (p = 0.31), and SNAPPE-II scores (p = 0.08) were similar in three groups. The need for repeated doses was the lowest in Group 1 (Group 1: n = 6, 33.3%; Group 2: n = 8, 50%; Group 3: n = 11, 78.6%; p = 0.04). There were no differences in terms of FiO_2 need between Group 1 and Group 2 at all study points (p > 0.05). Compared to Group 1 and Group 2, presurfactant FiO_2 need was lower (p = 0.003) and late postsurfactant need was higher in Group 3 (p = 0.01). Downes scores were similar across the groups in the presurfactant and early postsurfactant periods (p = 0.17 and p = 0.14). However, in the late postsurfactant period, Downes scores were lower in Group 1 compared to Group 3 (p = 0.02). Before surfactant administration, LUS scores were highest in Group 1 compared to Group 2 and Group 3 (p = 0.002). No differences were found in terms of LUS scores between the three groups in the early

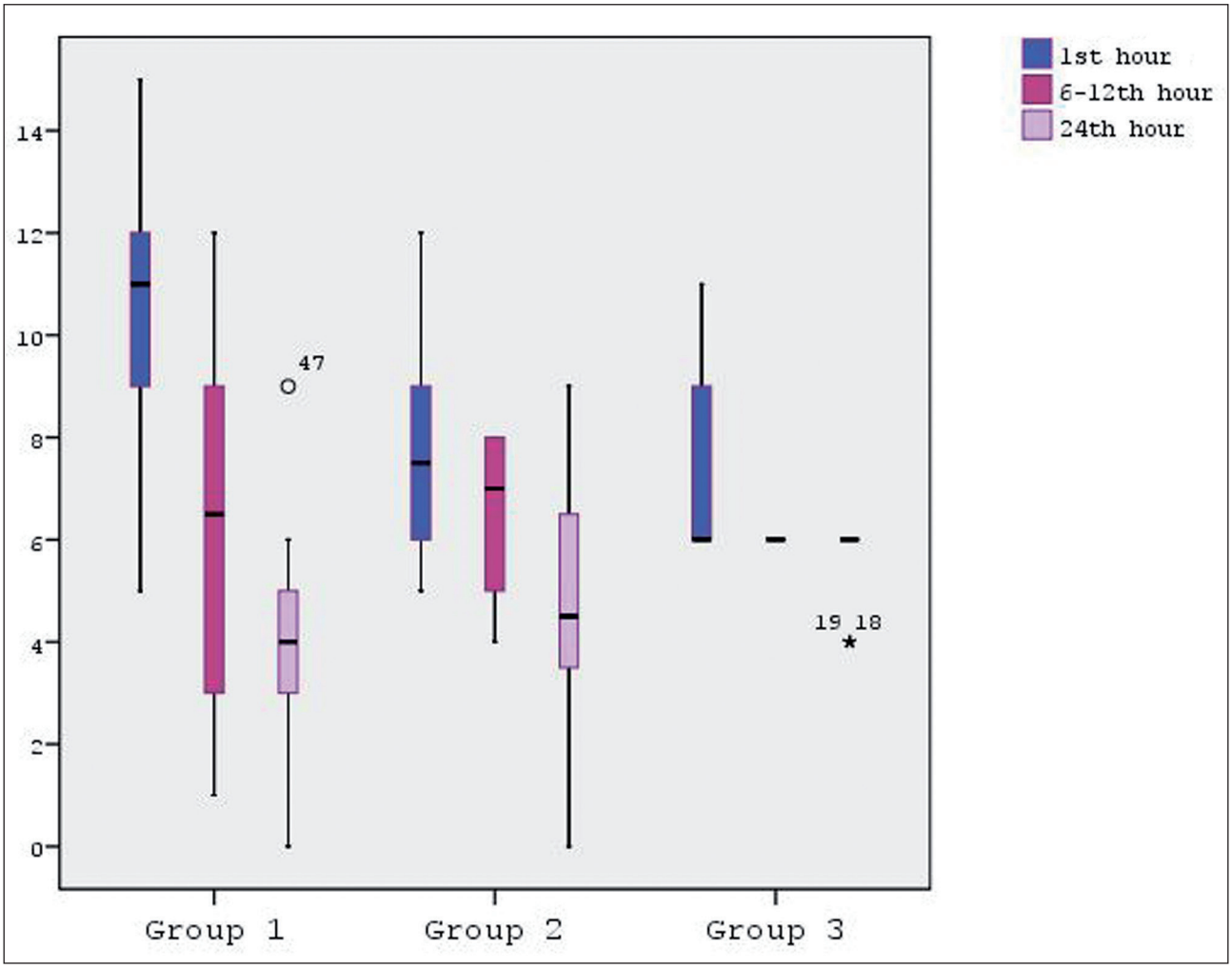

Figure 1 (ABS 3). Lung ultrasonography scores according to surfactant types in newborns with respiratory distress syndrome (Group 1: poractant alfa; Group 2: beractant; Group 3: calfactant).

postsurfactant period (p = 0.86). LUS scores were lower in Group 1 compared to Group 3 in the late surfactant period (p = 0.04) (**Fig. 1**). NICU stays were similar in groups (p = 0.72). None of the patients died.

CONCLUSIONS

In newborns with RDS, although poractant alfa and beractant have similarly reduced oxygen need in accordance with the LUS findings, poractant alfa seems to be superior to calfactant.

ABS 4

LUNG ULTRASONOGRAPHY IN PREDICTION OF SURFACTANT NEED IN PRETERMS

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INTRODUCTION

Lung ultrasonography (LUS) is a non-invasive bedside test and increasingly used by clinicians in the early recognition of most common neonatal respiratory conditions such as respiratory distress syndrome (RDS) and transient tachypnea of the newborn (TTN). In this study we aimed to evaluate the role of LUS in the prediction of surfactant need in newborns with respiratory distress.

METHODS

The newborns with a gestational age of 34 weeks or less, admitted to the NICU between November 2017 and April 2018, were eligible for the study. All subjects underwent clinical evaluation, chest X-ray and LUS at postnatal 1st, 12th and 24th hours. Simultaneously Downes scores were noted. LUS was performed by a trained neonatologist and the images were video recorded for subsequent

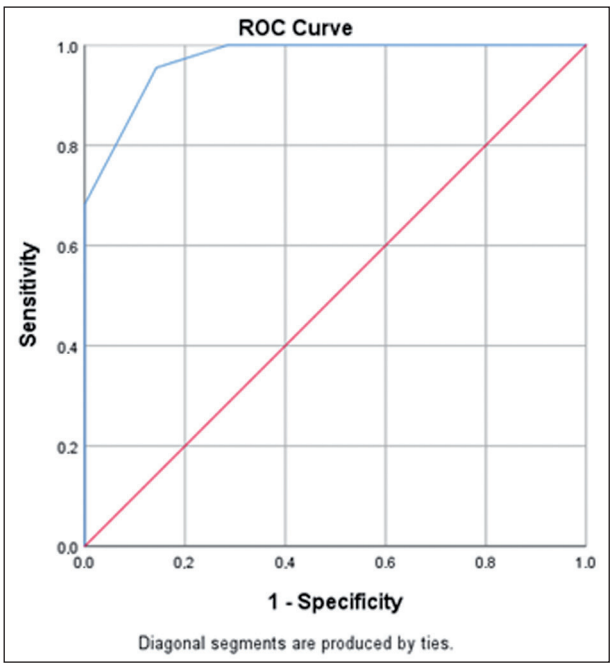

Figure 1 (ABS 4). Receiver operating characteristic (ROC) curve for predicting surfactant need.

assessment by a radiologist who was unaware of the clinical status of the subjects. Surfactant need was evaluated according to the European guidelines (2016) irrespective of LUS findings. All subjects (n = 43) were divided by surfactant need; Group 1 (surfactant [Poractant alfa] [+], n = 22) and Group 2 (surfactant [-], n = 21).

RESULTS

When comparing the groups, birthweight (p = 0.04), 5 min Apgar score (p = 0.001) and SNAPPE-II score (p = 0.001) were lower, the rate of chorioamnionitis (p = 0.005) was higher in Group 1. Mechanical ventilation (45.5% vs none) and nasal SIMV (31.8% vs 28.6%) were more frequently required in Group 1 compared to Group 2. Chest x-ray showed diffuse ground-glass opacification (n = 11) and reticulogranular appearance (n = 11) in Group 1, while normal aeration (n = 10), increased perihilar marking and fluid in fissures (n = 8) were noted in Group 2. FiO_2 values, Downes and LUS scores were higher in Group 1 at all study time points ($p < 0.001$, for all values). There were repeated surfactant needs in 10 of the 22 subjects in Group 1. LUS1 scores well correlated with $FiO_2$1 values ($r = 0.83$, $p < 0.001$). Repeated measure analyses showed a marked decrease in FiO_2, Downes and LUS scores from the 1st to 24th hours ($p < 0.001$, for all values). These values remained higher among those infants who needed repeated surfactant doses. LUS score predicted the need for surfactant (area under the curve = 0.97; 95% CI 0.93-1.0; $p \leq 0.001$) (**Fig. 1**). A LUS score cut-off of 5.5 predicted surfactant need with 95.4% sensitivity and 85.7% specificity, yielding a negative predictive value of 94.7% and positive predictive value of 87.5%.

CONCLUSION

In preterm infants ≤ 34 weeks, LUS scores are well correlated with FiO_2 requirement during the first hours of life. LUS has high predictive values for the determination of surfactant need in newborns with respiratory distress.

ABS 5

PROSPECTIVE EVALUATION OF PATENT DUCTUS ARTERIOSUS IN EXTREMELY LOW BIRTH WEIGHT INFANTS BORN AT HIGH ALTITUDE

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INTRODUCTION

Patent ductus arteriosus (PDA) is an important cause of mortality and morbidity in preterm infants. Due to the improvement in respiratory distress, the left-to-right shunt through the ductus arteriosus is augmented, thereby increasing pulmonary blood flow, which leads to pulmonary edema and worsening of cardiopulmonary status. We aimed to investigate the situation of PDA in ELBW infants that were born at high altitude (HA).

METHODS

Between 2013 and 2017, 200 ELBW infants born < 32 weeks and < 1,000 g were included in this prospective study. According to the gestational week (23-26, 27-28, 29-32 weeks), birth weight were divided into three groups (< 750 g, 750-1,000 g, 1,001-1,250 g). Echocardiographic investigations were performed at the 48th hour and on the 5th day on the infants and intravenous paracetamol was given to patients with ibuprofen contraindications to those who were in HAPDA. The relationship between the effectiveness of the drugs, their superiority and their associated problems was evaluated according to gestational week and birth weight groups. Our country is located at more than 2000 above sea level. The relationship between PDA and HA was also investigated.

RESULTS

After 48 hours of echocardiographic examination of the infants, PDA was detected in 117 (58.5%).

The frequency of patent ductus arteriosus was found to be increased in premature babies as the birth weight and the week decreased. In all the follow-ups, surgical ligation was applied to 21 (10.5%) out of 28 unblocked infants who closed the PDA in 86 (72.8%) of 114 babies who were found to be HAPDA and who had PDA closure treatment. It was observed that the response to PDA medical closure treatment was similar in the oral ibuprofen and intravenous paracetamol groups. We performed a ROC curve to find a threshold value for treatment benefit for birth weight and gestational week in all patients who received hemodynamically significant PDA occlusion therapy (**Fig. 1**). The threshold value for gestation week was 0.757 sensitivity and 0.539 selectivity, and the threshold value for birth weight was found to be 842.50 g for 27.50 weeks, 0.647 sensitivity and 0.522 selectivity.

CONCLUSIONS

The frequency of PDA in our study was higher than the PDA incidence of 58.5% (117 babies) and 47% according to 2010 NICHD data. This is due to the low rate of oxygen pressure at high altitude. It was observed that the response to haemodynamic PDA medical closure treatment was similar in the oral ibuprofen and intravenous paracetamol groups. We believe that this ROC curve result will provide a benefit in terms of benefit from closure therapy and that PDA may be resistant to treatment in infants under 27.5 weeks or 842.50 g. It is reported in the literature that birth week and birth weight are low when there is a treatment failure, but as far as we can tell there is no study with a threshold value.

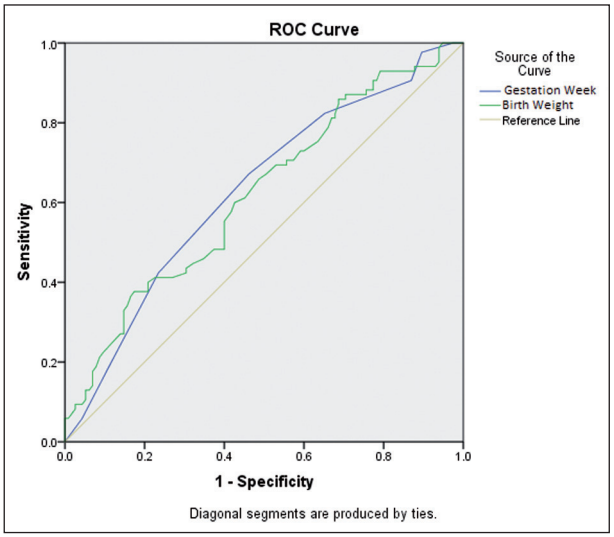

Figure 1 (ABS 5). ROC curve of threshold value for PDA treatment benefit.

ABS 6

ALVEOLAR CAPILLARY DYSPLASIA AS A RARE CAUSE OF SEVERE RESPIRATORY FAILURE IN TWO NEWBORNS. CASES REPORT

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INTRODUCTION

Respiratory failure is a relatively common entity in the neonatal intensive care unit. When its underlying condition is unclear and standard medical therapies are ineffective, diagnosis becomes a challenge. We present two neonates with alveolar capillary dysplasia (ACD) confirmed by histopathology and genetic testing.

CASE 1

A neonate (2,920 g) prenatally diagnosed with polyhydramnios, omphalocele and hydronephrosis was born by C-section in 39-week GA. Apgar scores 1' – 9, 5' – 10. On the 12th hour of life, the patient desaturated; noninvasive oxygen therapy was applied (FiO_2 = 0.6). Due to respiratory deterioration after omphalocele surgery the newborn was switched to conventional ventilation (FiO_2 = 0.4). Chest X-ray suggested pneumonia. Broad-spectrum antibiotics were started. Echocardiography revealed persistent pulmonary hypertension (PPHN) and atrial (ASD) and ventricular septal defects (VSD). PPHN was treated with inhaled nitric oxide (iNO) with marginal improvement. The neonate required invasive ventilation (FiO_2 = 1), surfactant administration and catecholamines infusion. Despite the intensive therapy, SpO_2 gradually decreased below 60%. The infant was switched to high-frequency ventilation without any improvement. The patient died on the 13th day of life after cardiac arrest and ineffective cardiopulmonary resuscitation (CPR).

CASE 2

A neonate (2,400 g) with prenatal suspicion of intrauterine growth restriction (IUGR) and coarctation of the aorta (CoA) was born by vaginal delivery at 39 weeks GA. Apgar scores were 1' – 8, 5' – 10. Pre- and post-ductal saturation differed by

10%. Chest X-ray showed inflammatory changes in the lungs. Continuous infusion of prostaglandins was applied. After initial echocardiography, an attempt to stop the infusion was made, but this resulted in sudden deterioration. The patient presented symptoms of PPHN with large ductus arteriosus and narrow pulmonary veins. CoA was not confirmed. The patient was intubated, prostaglandins infusion was re-administered and iNO was started with immediate improvement. However, the general condition deteriorated with increased oxygen demand (FiO_2 = 1). On the 9th day of life SpO_2 was below 65% despite very high ventilator setting and catecholamines therapy. On the 10th day of life the patient died due to cardiac arrest, CPR was ineffective.

RESULTS

No development of the capillary network and blood-air barrier was found in histopathology in both cases. Genetic testing of both patients revealed no point mutation in the FOXF1 gene, but FISH analysis showed deletion of one whole allele in the FOXF1 gene. The patients described are the first confirmed by genetic testing cases in Poland.

CONCLUSIONS

ACD is a fatal and rare disorder leading to respiratory failure early in life. ACD should be considered in neonates with primary or/and idiopathic PPHN who fail to respond to pulmonary vasodilator therapy including iNO therapy, especially if they also have gastrointestinal, cardiovascular and genitourinary system anomalies.

ABS 7

CAFFEINE AND ERYTHROPOIETIN PROMOTE CUMULATIVE PREVENTION OF APNEIC EVENTS IN MALE NEWBORN RATS EXPOSED TO INTERMITTENT HYPOXIA: APNEA OF PREMATURITY AND SEX DIMORPHISM

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INTRODUCTION

Owing to the immaturity of the brain, apnea of prematurity (AoP) occurs in more than 85% of infants born with less than 34 weeks of gestational age. AoP is associated with severe and repeated episodes of arterial oxygen desaturation (intermittent hypoxia – IH), which in turn increases respiratory instability and the number of apneas. While AoP and IH are frequent in preterm boys and girls, there is no data addressing whether IH leads to sex-specific respiratory consequences, or whether drugs targeting AoP are more effective in males or females. In this work, we used rat pups to investigate whether IH-mediated increase of apneas is sex-specific. Furthermore, we investigated whether caffeine (treatment of choice for AoP, but ineffective in about half of the cases), erythropoietin (Epo – a neuroprotective factor and potent respiratory stimulant at neonatal ages), and both drugs together (caffeine + Epo) prevent the IH-mediated formation of apneas in a sex-dependent manner.

MATERIAL AND METHODS

Newborn rats exposed to IH during postnatal days (P) 3-10 were used in this work. During this time, the animals underwent daily gavage with a vehicle, Epo, caffeine, and Epo + caffeine (10-12 pups/group). At P10 the frequency of apneas at rest were measured (by plethysmography), as an index of respiratory dysfunction induced by IH plethysmography.

RESULTS

Our results showed that IH induces 40% more apneas in the male than in the female rat pups. Moreover, results in males evidenced that caffeine and Epo significantly prevent the increase of apneas induced by IH, and that the administration of both drugs together provides a cumulative beneficial effect. Results in females showed that neither caffeine, Epo, nor both drugs together prevent the IH-mediated augmentation of apneic events.

CONCLUSION

We concluded that IH in newborn rats leads to sex-specific respiratory consequences. Our data also suggest that caffeine and Epo have similar and complementary effects in reducing IH-induced apneas in male but not in female animals. Finally, the combined caffeine + Epo treatment could be clinically relevant in the premature newborn suffering from AoP.

ABS 8

CORRELATION BETWEEN MATERNAL AND CORD SERUM LIPID PROFILES AND RESPIRATORY PROBLEMS OF PRETERM NEONATES

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INTRODUCTION

Respiratory problems in preterm infants (PIs) are related to difficulty in extrauterine adaptation due to immaturity. Lipid metabolism plays an important role in increasing amniotic fluid lecithin levels with maturation of pulmonary function. Fetal alveolar type II epithelial cells utilize lipid substrates to synthesize Dipalmitoylphosphatidyl choline, the major surfactant lipid that lowers surface tension at the alveolar air-fluid interface. The aim of this study is to correlate the levels of lipid profiles in maternal and cord blood of PIs with respiratory disorders, also to investigate the levels of lipid profiles in maternal and cord blood as early predictors of respiratory disorders of PIs.

METHODS

This study is a longitudinal prospective study. It was conducted on 50 women who delivered prematures and on their PIs. Exclusion criteria were: small for gestational age, hypoxic-ischemic encephalopathy, clinically diagnosed major congenital anomalies and mothers who had complicated pregnancy (such as hypertension, intake of drugs that affect lipid metabolism such as steroids…). Blood samples were obtained from the mothers the at time of labor and from cord blood of their PI for estimation of serum total cholesterol (TC), high density lipoprotein (HDL), low density lipoprotein (LDL) and triglycerides (TG). The tests were performed using an automated clinical chemistry analyzer. Follow-up was performed daily on the PIs for early detection of any respiratory problems and for short-term outcome of these problems until discharge from NICU or death.

RESULTS

The PIs were divided into 3 groups (Gr); no respiratory problems (noRP) (18%), TTN (36%) and RDS (46%). There was a statistically significant (SS) decrease in maternal serum LDL ($p = 0.000$), TC ($p = 0.002$) and TG ($p = 0.02$) in RDS Gr; however, HDL showed a SS decrease ($p = 0.03$) in TTN Gr. In cord serum (CS), there was SS decrease in HDL ($p = 0.000$), LDL ($p = 0.02$) and TC ($p = 0.01$) in RDS Gr. There was SS positive correlation between maternal serum and CS HDL, LDL and TC ($p = 0.000$). For prediction of respiratory problems in PI, the best cut-off point for maternal HDL is ≤ 29 mg/dl with sensitivity of 43.9% and specificity of 100%; and for maternal LDL it is < 121 mg/dl with sensitivity of 82.93% and specificity of 88.8%. For the same purpose, the best cut-off point of CS HDL is ≤ 29 mg/dl with sensitivity of 53.6% and specificity of 100% and of CS LDL is < 113 mg/dl with sensitivity of 70.7% and specificity of 77.7%. A multivariate logistic regression analysis for maternal lipid profile as predictors of respiratory problems in their preterm infants is presented in **Tab. 1**.

Table 1 (ABS 8). Multivariate logistic regression analysis for maternal lipid profile as predictors of respiratory problems in their preterm infants.

	B	S.E.	Wald	Sig.
HDL (mg/dl)	-0.201	0.085	5.537	0.019
LDL (mg/dl)	-0.126	0.061	4.197	0.04
TC (mg/dl)	-0.026	0.038	0.477	0.49
TG (mg/dl)	0.002	0.023	0.011	0.917

This table shows maternal LDL and HDL can be used as predictors for respiratory problems in their preterm neonates.
HDL: high density lipoprotein; LDL: low density lipoprotein; TC: total cholesterol; TG: triglycerides.

CONCLUSIONS

Respiratory problems (RPs) are accompanied by lipid alteration in PI and their mothers. Low plasma lipid concentration during gestation appears to generate negative effects on fetal lung development. Lipid metabolism in maternal and CS had SS correlations with each other. Lower levels of HDL and LDL either in maternal or CS of PI could predict the occurrence of RDS. No SS difference between maternal and CS HDL and LDL as a predictor of RPs in PIs.

ABS 9

EFFECT OF LUNG-PROTECTIVE RESPIRATORY MANAGEMENT ON EXPOSURE TO INVASIVE VENTILATION AND BRONCHOPULMONARY DYSPLASIA OUTCOME

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INTRODUCTION

Respiratory management in preterm infants, with introduction of the less invasive surfactant

administration (LISA) technique, Synchronized nasal ventilation (SNIPPV) and lung-protective high frequency oscillatory ventilation (HFOV) applying lower tidal volume has been implemented over the last four years in our institution. The aim of this study is to evaluate the impact of these strategies on exposure to mechanical ventilation and on survival without bronchopulmonary dysplasia 2-3 outcome.

METHODS

Observational study including all preterm infants born with less than 32 weeks GA admitted to our institution from January 2012 to December 2017. LISA was implemented in November 2013, SNIPPV in October 2013 and low tidal HFOV in 2014. Perinatal data and outcomes of preterm infants born between January 2012 and December 2013 (n = 232) are compared with those born between January 2015 to December 2017 (n = 289).

RESULTS

A total of 521 patients were included. Comparative analysis between periods is shown in **Tab. 1**. As expected, there was an increase in the use of the LISA technique, SNIPPV and HFOV in the second period. When adjusted for perinatal risk factors, exposure to mechanical ventilation was reduced both in the first 3 dol (OR 1.750, 95% CI 1.153-2.656, p 0.009) and after the first 3 dol (OR 2.305, 95% CI 1.119-4.745, p 0.023) with a significant increase in survival without BPD 2-3 in the second period (OR 2.23, 95% CI 1.386-3.603, p 0.001). In mechanically ventilated patients there was also an increase in survival without BPD 2-3 due to the group of infants born between 26 and 28^{+6} weeks GA (OR 2.129, 95% CI 1.056-4.294, p 0.035).

CONCLUSION

Less invasive respiratory support and lung-protective ventilator strategies can effectively reduce exposure to mechanical ventilation and ventilator-

Table 1 (ABS 9). Comparative analysis between 2012-2013 and 2015-2017.

		2012-2013 (n = 232)	2015-2017 (n = 289)	p	
GA, median (SD)		28.517 (2.37)	28.35 (2.38)	0.425	
SNIPPV		12 (5.2%)	71 (24.5%)	< 0.001	
Surfactant		129 (55.6%)	153 (52.6%)	0.537	
LISA		5 (2.2%)	64 (22%)	< 0.001	
MV first 3 dol		111 (47.8%)	115 (30.5%)	0.043	
MV after 3 dol		31 (13.4%)	31 (10.7%)		
No MV		90 (38.8%)	145 (39.8%)		
HFOV on day 3		31 (13.4%)	58 (19.9%)	0.06	0.006 [a]
CMV on day 3		24 (10.3%)	15 (5.2%)		
CPAPn on day 3		114 (49.1%)	152 (52.2%)		0.031
PDA		75 (32.2%)	96 (33%)	0.873	
Nosocomial sepsis		140 (60.3%)	114 (39.2%)	< 0.001	
SF-BPD 2-3		144 (62.1%)	203 (71.1%)	0.031	
SF-BPD 3		181 (78%)	238 (81.8%)	0.321	
Mortality		33 (14.2%)	40 (13.7%)	0.899	
Logistic regression (2012-2013 vs 2015-2017) adjusted by GA, prenatal steroids, gender and placental histology					
		OR	**95% CI**	**p**	
No MV first 3 dol		1.750	1.153-2.656	0.009	
No MV after first 3 dol		2.305	1.119-4.745	0.023	
SF-BPD 2-3		2.234	1.386-3.603	0.001	
SF-BPD 2-3 in mechanical ventilated patients [b]	**• Less than 26 w**	1.857	0.635-5.428	0.258	
	• 26-29 w	2.129	1.056-4.294	0.035	
	• 29-32 w	0.330	0.105-1.039	0.058	

Rates expressed n (%). Multiple logistic regression adjusted by GA (weeks); Prenatal steroids treatment, gender and placental histology.
SNIPPV: synchronized nasal ventilation; LISA: less invasive surfactant administration; MV: mechanical ventilation; HFOV: high frequency oscillatory ventilation; SF-BPD 2-3: survival without BPD 2-3; SF-BPD 3: survival without BPD 3.
[a] Compared to conventional mechanical ventilation (CMV); [b] in infants exposed to invasive mechanical ventilation (IMV), GA is an interaction factor, with an increase in SF-BPD 2-3 just in the group of preterm infants born between 26 to 29 w GA.

induced lung injury when implemented in clinical practice.

ABS 10

FETAL GROWTH RESTRICTION IS ASSOCIATED WITH BRONCHOPULMONARY DYSPLASIA IN VERY PRETERM NEWBORNS

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INTRODUCTION

Several studies assessed the influence of fetal growth restriction (FGR) on bronchopulmonary dysplasia (BPD), but not all were able to identify a significant association. Our aim was to assess the association between FGR and BPD in preterm newborns, prospectively recruited at 11 level III Portuguese neonatal centres.

METHODS

Obstetrical and neonatal data on mothers and preterm infants with gestational age between 24 and 30 weeks, born during 2015 and 2016 after a surveilled pregnancy, were prospectively analyzed. FGR was classified according to obstetrical indexes and BPD was defined as the dependency on oxygen until 36 weeks of corrected age. Statistical analysis was performed using IBM® SPSS® statistics 23 and a p-value < 0.05 was considered statistically significant.

RESULTS

Out of 614 preterms, a total of 494 preterms delivered by 410 women were enrolled in the study. There were 40 (8.0%) newborns with FGR criteria. FGR preterm newborns were more often associated with a singleton pregnancy, had increased use of antenatal corticosteroids, increased prevalence of gestational hypertensive disorders, C-section, rupture of membranes below 18 hours, rate of intubation in the delivery room, use of surfactant treatment, oxygen therapy, need for mechanical ventilation, BPD, cystic peri-ventricular leukomalacia, nosocomial sepsis and pneumonia; they also had lower prevalence of chorioamnionitis and lower Apgar scores. The multivariate analysis by logistic regression, adjusted for BPD risk factors revealed a significant association between FGR and BPD (OR = 5.2 [CI: 1.46-18.58]; p = 0.01).

CONCLUSION

The results of this study increase the scientific evidence that FGR may act as an independent risk factor for BPD.

ABS 11

MEDIUM-TERM FOLLOW-UP OF PRETERM INFANTS TREATED WITH LESS INVASIVE SURFACTANT TECHNIQUE (LISA)

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INTRODUCTION

Early surfactant treatment improves respiratory outcomes in patients with respiratory distress syndrome. Until recently, exogenous surfactant administration required intubation and positive pressure ventilation. To reduce this exposure, early extubation has been proposed (intubation-surfactant-extubation, INSURE), but invasive mechanical ventilation (iMV) is still required in some cases. To prevent intubation, less invasive surfactant administration (LISA) has been described recently. Our previous studies have shown a reduction in the exposure to iMV in the first 3 days of life with LISA (OR 3.596; 95% CI 1.216-10.638; p = 0.02), but little is known regarding evolution in the medium-long term. The aim of this study is to compare the medium-long term evolution of premature infants up to 24 months postmenstrual age who received surfactant through LISA with that of patients treated with INSURE.

METHODS

This single-center, observational and descriptive case-control study involved a sample of 60 patients (30 cases and 30 controls) that were breathing spontaneously on nCPAP during the first 3 days of life and who met the criteria for exogenous surfactant administration. Data on short and medium-long term evolution were collected retrospectively and the results were compared between the two groups. The patients were also stratified by gestational age and birth weight to homogenize the samples. The need for hospitalization, psychomotor development and respiratory and neurological outcomes in the medium-long term were also studied.

RESULTS

98 preterm infants < 32 WG were born between October 2013 and November 2014 and 30 patients met the inclusion criteria for LISA. The control group was collected from the period immediately before the start of the study (from June 2012 to September 2013), including 30 preterm infants born at < 32 WG who met the inclusion criteria. There were no differences between the two groups in terms of baseline characteristics or prenatal risk factors, except for the fact that the LISA group included preterm infants with lower cranial perimeter and weight, higher CRIB index and more frequent intra-uterine growth restriction and advanced resuscitation maneuvers than the INSURE group. No statistically significant differences were found in mechanical ventilation time or in the incidence of short-term complications between the two groups. However, no differences were observed in the number of admissions and respiratory and neurological outcomes in the medium-long term between the two techniques. Neither were statistically significant differences found when stratifying the patients by gestational age or birth weight (**Tab. 1**).

CONCLUSIONS

The administration of surfactant by LISA is feasible and safe and reduces iMV exposure. In our study we found no differences regarding mortality, hospital admissions and respiratory and neurological outcomes compared to INSURE. Currently, the LISA technique seems to be safe and effective in the short and medium-long term.

Table 1 (ABS 11). Comparison of medium-long term results between the LISA and INSURE techniques.

		LISA (n = 28)	INSURE (n = 29)	p (95% CI)
Number of hospital admissions, n (%)	1 admission	6 (21.4%)	6 (20.7%)	0.847
	2 admissions	2 (7.1%)	4 (13.8%)	
	3 admissions	2 (7.1%)	2 (6.9%)	
	4 admissions	1 (3.6%)	0 (0%)	
	5 admissions	1 (3.6%)	2 (6.9%)	
Patients requiring hospital admission (respiratory cause), n (%)		7 (25%)	8 (27.6%)	0.825
Number of hospital admissions (respiratory cause), n (%)	1 admission	4 (14.3%)	5 (17.2%)	0.542
	2 admissions	1 (3.6%)	3 (10.3%)	
	3 admissions	1 (3.6%)	0 (0%)	
	4 admissions	0 (0%)	0 (0%)	
	5 admissions	1 (3.6%)	0 (0%)	
Severe respiratory disease (> 1 hospital admission), n (%)		3 (10.7%)	3 (10.3%)	0.964
Intensive Care Unit admissions, n (%)		2 (7.1%)	2 (6.9%)	0.971
Domiciliary oxygen therapy, n (%)		3 (10.7%)	0 (0%)	0.07
Respiratory symptoms n (%)		9 (32.1%)	16 (55.2%)	0.08
Delay in the acquisition of developmental milestones, n (%)		8 (29.6%)	4 (16%)	0.244
Brunet Lézine Test Global Punctuation, average		90.23	90.8	0.743
Brunet Lézine Classification, n (%)	Moderate/ severe	1 (4.5%)	1 (5%)	0.989
	Mild	3 (13.6%)	3 (15%)	
	Normal	18 (81.8%)	16 (80%)	
Exitus		2 (6.66%)	1 (3.33%)	0.554

LISA: less invasive surfactant administration; INSURE: intubation-surfactant-extubation.

ABS 12

NEONATE WITH EMPYEMA AND RASH – A TYPICAL PRESENTATION OF A RARE INFECTION?

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INTRODUCTION

Empyema is a rare and serious complication of neonatal pneumonia. *Group A Streptococcus* (GAS) was a frequent agent of neonatal infections in the pre-antibiotic era but it is nowadays rarely involved. In recent years, some strains of GAS have been re-emerging in developed countries as a cause of severe invasive disease.

CASE REPORT

A male neonate was born at 36 weeks gestation by unplanned and unassisted delivery at home. The baby was born vigorous and the umbilical cord clamped after five minutes by the paramedics. The mother was young, healthy and the pregnancy uneventful except for a presumed fungal vaginal discharge. On admission, the baby had normal physical examination and blood test results. At 48 hours of life he was admitted to the NICU for early onset sepsis presenting as grunting, respiratory distress, hypotonia, feeding difficulty, pallor and petechiae. Laboratory tests reported normal hemoglobin, leucopenia (1.0×10^9/L) with neutropenia (0.6×10^9/L), low platelet count (132×10^9/L), elevated serum C-reactive protein (CRP) of 11.5 mg/dL and blood gases with pH: 7.13, $PaCO_2$: 69 mmHg, HCO_3: 17.8 mmol/L, lactate: 5 mmol/L. The patient was placed initially on non-invasive ventilation and then intubated and ventilated. Ampicilin plus gentamicin were started. Lumbar puncture revealed normal cerebrospinal fluid. Chest X-ray showed right pleural effusion confirmed by thoracic ultrasonography (10 mm). Thoracentesis drained 56 ml of purulent fluid, with 153,460 nucleated cells (mostly polymorphonuclear leukocytes), undetectable levels of glucose, protein: 3.9 g/dL, LDH: 13,262 U/L. At 72 hours of life, despite ongoing respiratory improvement, he developed a generalized maculopapular erythematous rash, gastric hemorrhage, thrombocytopenia (37×10^9/L) and increasing CRP (21.0 mg/dL), so cefotaxime and micafungin were added. Suspecting GAS infection, maternal vaginal and throat swabs were taken. Pleural fluid and vaginal cultures were positive for GAS, both of the emm1 type (M1 serotype) carrying the genes for superantigens SpeA, SmeZ, SpeJ and SpeG. The patient completed 21 days of ampicillin and gentamicin and was discharged in good general condition with a normal chest radiograph.

DISCUSSION

Only a few cases of neonatal GAS empyema are reported in the literature, and some describe leucopenia, but none describes this rash that has been associated with the GAS toxin. The strain isolated from the mother and neonate was of the M1 serotype (genotype emm1), currently that most frequently involved in invasive disease, and usually, as in this case, carrying the erythrogenic toxin SpeA. The finding of this rash may help in earlier suspicion of this infection and thus allow clinicians to consider the addition of an antitoxin drug such as clindamycin in severe cases, as well as aid in the identification of this etiologic agent by specifically testing for GAS when cultures are negative.

ABS 13

NON-INVASIVE SURFACTANT REPLACEMENT IN PRETERM INFANTS BORN BEFORE 32 WEEKS OF GESTATION – THE EXPERIENCE OF ONE TERTIARY ACADEMIC HOSPITAL

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INTRODUCTION

The efficacy of surfactant in the treatment of respiratory distress syndrome (RDS) is well known, but mechanical ventilation has been associated with lung injury and chronic lung disease (CLD). Therefore, non-invasive methods for surfactant replacement have been investigated. The aim of the study was to investigate the efficacy and safety of surfactant treatment in preterm infants born before 32 weeks of gestational age (GA) diagnosed with

RDS admitted to one tertiary academic public hospital.

METHODS

Inborn preterms with GA less than 32 weeks diagnosed with RDS requiring surfactant and respiratory support admitted to one tertiary academic public hospital were enrolled. Demographics, antenatal and perinatal interventions were recorded. Spontaneously breathing preterm infants received Curosurf® (200 mg/kg) via a gastric tube/angiocatheter placed in the trachea by direct laryngoscopy without premedication, followed by nasal CPAP, after receiving i.v. caffeine. The neonates who needed interventions at birth received surfactant after intubation (conventional or INSURE method).

RESULTS

In total, 94 infants were enrolled in this prospective institutional review board-approved study, during January 2016 to June 2018. Mean GA was 26.85 ± 2.38 weeks; mean birth weight (BW) was 951.70 ± 313.549 grams. Of the patients, 49% (n = 48) were male, 19% (n = 18) infants were from multiple gestations and 62% (n = 58) had been delivered by caesarean section. Surfactant was successfully administered via non-invasive technique (study group) to 50% (n = 47) and 50% (n = 47) infants received surfactant after intubation – conventional or INSURE (control group). The need for mechanical ventilation (SIMV) at 72 hours of age was reduced from 95.74% in the control group to 29.41% in the study group in our cohort. A trend towards reduction in the incidence of morbidity was recorded in the study group compared to the control group: grade II or higher intraventricular haemorrhage (IVH) decreased from 39.58% to 15.15% (p = 0.01), retinopathy of prematurity (ROP) from 31.25% to 15% (p = 0.05), mortality from 29.16% to 2.94% (p = 0.01); however, no significant differences were recorded for CLD (from 39.58% to 35.29%, p = 0.3).

CONCLUSIONS

The non-invasive surfactant replacement method seems to improve short-term respiratory outcomes and significantly reduces severe morbidity during hospitalization, subsequently improving the preterm infant's outcome.

ABS 14

OBSERVATIONAL STUDY OF INTRAVENTRICULAR HEMORRHAGE IN NEWBORNS WITH PULMONARY HEMORRHAGE

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INTRODUCTION

Pulmonary hemorrhage (PH) is a serious respiratory complication of prematurity with a high risk of mortality and morbidity. Many risk factors have been associated with the development of PH, but the exact pathogenesis remains unknown. Previous research suggests a three-fold higher risk of severe intraventricular hemorrhage (IVH) with PH. The aim and objectives of this study were to identify the rate of IVH in newborns with PH, compared to published rates, and to identify risk factors for IVH in newborns with PH in order to better predict and prevent this complication.

METHODS

We performed an observational retrospective cohort study involving neonates with PH during their admission to a tertiary neonatal unit from 2011 to 2018. PH was defined as the presence of hemorrhagic fluid in the trachea, accompanied by significant clinical deterioration. Antenatal and postnatal data (before PH) were collected and analysed: prolonged rupture of membranes (> 24 h), maternal fever (> 37.9°C), antenatal steroids, plurality, gestational age, birth weight, gender, 5-min-Apgar (< 5), admission temperature, worse pH, worse lactate, respiratory management (including surfactant), higher FiO_2, PDA assessment, PDA width, PDA treatment, volume replacement, inotrope use, highest CRP, IVH (including severity and laterality), length of stay (LOS), bronchopulmonary dysplasia (BPD), death and combined BPD/death. Numerical data are presented as median; interquartile range and categorical data as ratio and percentage. Statistical significance was tested using the Mann-Whitney-U-Test for numerical data and the Chi-Square/Fisher-Exact-Test for categorical data; $p < 0.05$ was considered significant.

RESULTS

42 neonates with a median gestational age of 25 (IQR 24-27) weeks and a birth weight of 728 g (IQR 597-969) developed PH at a median age of 59 h. 57% of the infants developed IVH; of these, 54% had grade-3 IVH or above on at least one side. 38% of the infants died and 88% of the survivors

Table 1 (ABS 14). Characteristics of the population studied with and without intraventricular hemorrhage.

Characteristics	IVH (n = 24)	No IVH (n = 18)	p-value
PROM (> 24 h)	4/24 (17)	3/18 (17)	1.000
Maternal fever (> 37.9°C)	1/24 (4)	1/18 (6)	0.834
Antenatal steroids	21/24 (88)	13/18 (72)	0.212
C-section	11/24 (46)	11/18 (61)	0.326
Plurality	5/24 (21)	2/18 (11)	0.611
Male gender	11/24 (46)	9/18 (50)	0.789
Gestation (weeks)	25 (25-26)	26 (24-30)	0.435
Birth weight (g)	746 (639-865)	699 (581-1,118)	0.728
5'-Apgar < 5	6/24 (25)	3/18 (17)	0.515
Temperature < 36°C	2/24 (8)	4/18 (22)	0.203
Worst pH	7.1 (7.0-7.2)	7.2 (7.1-7.3)	0.303
Worst lactate (mmol/l)	5 (3-8)	4 (2-7)	0.542
Resp. management [a]	6/18 (33), 0/18 (0), 12/18 (66), 0/18 (0)	11/24 (46), 0/24 (0), 12/24 (50), 1/24 (4)	0.620
Highest FiO_2	0.5 (0.35-0.66)	0.5 (0.46-0.68)	0.347
Time of PH (h)	62 (34-113)	42 (13-146)	0.317
Echocardiography performed	21/24 (88)	15/18 (83)	0.703
PDA width (mm)	2 (1.7-2)	2 (1.8-2.3)	0.190
RI ACA	0.8 (0.71-0.81)	0.8 (0.75-0.8)	0.984
Absent/reversed flow in SMA	2/18 [a] (11)	4/10 [a](40)	0.074
Inotropic support	7/24 (29)	5/18 (28)	0.921
NSAID	13/24 (54)	8/18 (44)	0.533
Highest CRP	5 (0-48)	0 (0-16)	0.159
Oxygen at 36 weeks	16/24 (67)	7/18 (39)	0.085
Death	2/24 (8)	10/18 (56)	0.018
Combined death/BPD	21/24 (88)	17/18 (94)	0.448
LOS (days)	118	46 (6-99)	0.003

Data are displayed as median (IQR) or ratio (percentage), $p < 0.05$ significant.
IVH: intraventricular hemorrhage; PROM: prolonged ruptured membranes; PH: pulmonary hemorrhage; PDA: patent ductus arteriosus; RI ACA: resistance index anterior cerebral artery; SMA: superior mesenteric artery; NSAID: nonsteroidal anti-inflammatory drug; CRP: c-reactive protein; BPD: bronchopulmonary dysplasia; LOS: length of stay.
Respiratory management before PH: [a] Intubation at birth but no ventilation later or no intubation at birth and no ventilation or intubation at birth and ventilation or no intubation at birth but ventilation later.

went on to develop BPD. Newborns with IVH had a nearly 3 times higher LOS and a trend towards a higher BPD rate compared to those without IVH, whilst mortality was higher in those without IVH. When BPD and death rate were combined, no statistical difference was found. No other significant differences were seen in the remaining variables (**Tab. 1**).

CONCLUSIONS

Severe IVH is significantly more common in preterms with PH. LOS in newborns with PH and IVH is high, suggesting a significant disease burden. None of the risk factors for PH appear to be significantly related to the risk of IVH. Further studies are needed to explore the underlying mechanisms increasing the risk of IVH with PH.

ABS 15

OXIDATIVE STRESS MARKERS IN PREMATURE INFANTS WITH HYPOXIA

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INTRODUCTION

Plasma lipoproteins are a target for the free radicals induced by oxidative stress, which is determined by

the imbalance between the pro-oxidants and anti-oxidants. The intra and extracellular antioxidant systems of the human body provide protection against excessive free radicals, but they are inefficient in premature born infants.

METHODS

Our aim is to shed light on the mechanism of hypoxia-induced modification of molecular disfunction. Study lot: 55 premature infants born between January 2016 - January 2017, in the Bega Hospital of Timisoara. Inclusion criteria: gestational age under 32 weeks, Apgar score ≤ 6 at 5 min, pH at birth ≤ 7.20. We took two blood samples: at birth and at 72 hours of life. We determined d-ROMs (plasma oxidative capacity) and BAP (plasma antioxidant potential). An increase in d-ROMs and/or a decrease in BAP are indicators of oxidative stress.

RESULTS

The level at which oxidative stress (d-ROMs) begins was established at 320. At birth we had a maximum level of 545.8 (high risk). The ideal level for BAP is 1,900. At birth in 17 cases anti-oxidant capacity was favorable. At 72 hours of life d-ROMs increased in the majority of cases, but the rise was not significant, and it was associated with an increase in BAP. In 5 cases, d-ROMs remained high and BAP remained under the ideal level; in these cases, death occurred.

CONCLUSIONS

Markers indicate that oxidative stress occurs in the perinatal period and may persist in the newborn. The evolution of oxidative stress markers does not necessarily indicate irreversible tissue damage, but there is a strong correlation between high d-ROM levels and negative clinical evolution.

ABS 16

RESCUE HIGH FREQUENCY OSCILLATORY VENTILATION IN NEWBORNS AFTER FAILURE OF CONVENTIONAL VENTILATION: RESCUE-HFOV TRIAL

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INTRODUCTION

In an attempt to achieve gas exchange goals and also mitigate lung injury, infants with respiratory failure despite conventional ventilation (CV) are switched to high frequency oscillatory ventilation (HFOV). Although this type of rescue HFOV is preferred in many NICUs, there is no recent data on it in the new era. The aim of the study is to evaluate the risk factors that affect response to rescue HFOV in newborns who had CV failure.

METHODS

A multicenter, prospective, observational study was conducted on infants who had been receiving CV for at least 4 h and who were then switched to rescue HFOV, over the period of one year. An online national registry was set up and electronic case record forms of patients with gestational age (GA) of 24 weeks or higher from 23 participating NICUs were evaluated. Patients were grouped as Survived (Group S) and Dead/ECMO (Group DE). Demographic characteristics of the patients in addition to their ventilator settings, arterial blood gas (ABG) analysis at 0, 1, 4 and 24th h of HFOV, type of devices, duration of ventilation and complications were compared between the groups.

RESULTS

Three-hundred-and-seventy-two patients were enrolled in the study. Major diseases requiring rescue HFOV were listed as respiratory distress syndrome

(47%), congenital pneumonia (12%), sepsis (9%), congenital diaphragmatic hernia (8%), meconium aspiration syndrome (6%) and persistent pulmonary hypertension (5%). HFOV was successful in 58.1% of patients in preventing death and ECMO. GA (31.8 ± 5 vs. 30.9 ± 5.4 weeks), gender, postnatal intubation time (4 vs. 1 h), CV duration prior to HFOV (30 vs. 27 h), initial HFOV settings except FiO_2 and the duration of HFOV (72 vs. 90 h) were not different between groups ($p > 0.05$). Mean birth weight (BW) was lower (1,655 ± 1,091 vs. 1,858 ± 1,027 g), initial FiO_2 setting (83% vs. 72%), and nitric oxide exposure rates (21.8% vs. 11.1%) were higher in Group DE infants than in Group S infants.

CONCLUSIONS

Rescue HFOV proved successful in more than half of the patients who failed with CV. Although it was not associated with GA, underlying diagnosis or initial ventilation settings, rescue HFOV seems to be more effective in patients with higher BW and not requiring nitric oxide. Initial pH, HCO_3 and lactate levels on ABG may be used as predictive factors for response.

ABS 17

RISK FACTORS FOR THE DEVELOPMENT OF INGUINAL HERNIA IN PREMATURE NEONATES WITH BW < 1,500 G AND GA < 32 WEEKS

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INTRODUCTION

Inguinal hernia (IH) is a very common condition during infancy and childhood. Its incidence is estimated to be 3-5% in full-term neonates but it is higher in preterm neonates (9-11%), especially in those with gestational age (GA) < 28 weeks and BW < 1,000 g (35%). It is still unclear whether common co-morbidities in this population, such as respiratory distress syndrome (RDS) or bronchopulmonary dysplasia (BPD) contribute to the development of IH.

AIM

1) To establish the epidemiologic profile of infants with IH with respect to incidence by GA at birth and BW; 2) to analyze the impact of risk factors such as RDS, BPD or the use of nCPAP on the incidence of IH in preterm infants of 32 weeks gestation with BW < 1,500 g.

MATERIALS AND METHODS

In this retrospective observational study, preterm neonates with GA < 32 weeks and BW < 1,500 g, hospitalized in our department over a two-year period, were studied. The incidence of IH and also the relative risk of the disease with RDS, BPD or the use of nCPAP were recorded.

RESULTS

The overall incidence of IH in infants of 32 weeks gestation or less, and in those with BW < 1,500 g was 14.28% (9/62) and 14.51% (9/63) respectively. The incidence was higher in the youngest group and decreased with increasing GA. The risk of inguinal hernia was found to be higher in preterm neonates with RDS (RR = 41%) and in those with BPD (RR = 200%). Regarding the use of nCPAP, inguinal hernia occurred in 38.9% of the infants who needed nCPAP. It is noteworthy that among the preterm infants in the study who needed nCPAP support, those with BW < 1,000 g were found to be at 95% greater risk of developing inguinal hernia than those with BW 1,000-1,500 g.

CONCLUSIONS

The role of prematurity in the development of inguinal hernia is widely recognized. In addition, there are also other morbidities of preterm neonates, such as RDS, BPD and the need for respiratory support (nCPAP), which seem to increase significantly the incidence of inguinal hernia (possibly due to the increase of intra-abdominal pressure) in this vulnerable population.

ABS 18

THE ROLE OF LUNG ULTRASOUND IN THE DIAGNOSIS AND FOLLOW-UP OF NEONATAL PNEUMONIA

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INTRODUCTION

Neonatal pneumonia is an important cause of neonatal infection and accounts for significant morbidity and mortality, especially in developing countries, in the neonatal intensive care unit (NICU). Lung ultrasound (LUS) is a simple and non-invasive bedside test which is increasingly used by clinicians

for the early recognition of respiratory disorders in newborns. This study was planned to identify acute ultrasonographic changes in the lungs of newborns with pneumonia.

METHODS

A total of 50 newborns who were admitted to NICU with pneumonia were eligible for the study. All patients were evaluated by Silverman score, chest X-ray and LUS on admission. LUS was repeated at the end of the first and second weeks of treatment. For LUS, the trans-thoracic approach was performed with longitudinal scans of the anterior, posterior and lateral chest walls.

RESULTS

The mean postnatal ages of all patients were 25.1 ± 24 days with a mean NICU stay of 8.1 ± 1.9 days. On admission, the mean Silverman score was 6.9 ± 1.1. Lung consolidation with air bronchograms (100%; 50/50) (**Fig. 1**), abnormal pleural line (70%; 35/50), severe B lines (64%; 32/50), absence of lung sliding (80%; 40/50), and absence of A lines (66%; 33/50) were detected by LUS. At the first week control LUS, we observed that lung consolidation with air bronchogram, the most prominent finding of pneumonia, was markedly decreased (12%; 6/50). At the end of the second week, lung sliding movement and A lines were seen, while B lines and pleural line irregularities were lost in all patients. The disappearance of abnormal findings in LUS after treatment was consistent with improvements in clinical and chest X-ray findings. Viral agents were identified in 64% of the patients (32/50). No growth was detected in blood cultures.

CONCLUSIONS

This study further confirms the important role of LUS in the diagnosis and follow-up of neonatal pneumonia. As shown, the main features of pneumonia include lung consolidation with air bronchograms, and pleural line abnormalities. The study also showed that dynamic changes occurred in lungs after treatment. However, more experience is needed to replace chest X ray with LUS in neonatal pneumonia.

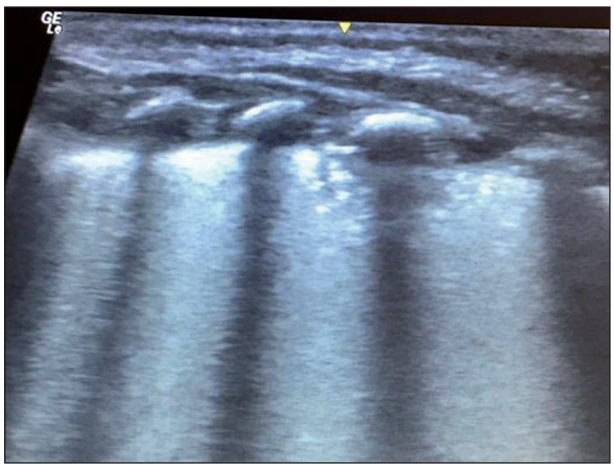

Figure 1 (ABS 18). Lung consolidation with air bronchogram.

ABS 19

THE SEVERITY OF RESPIRATORY SYNCYTIAL VIRUS INFECTION IN THE NEONATAL PERIOD

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INTRODUCTION

The respiratory syncytial virus (RSV) causes 12-63% of all acute respiratory tract infections (ARTI) in children, 19-81% of ARTI in children that require hospitalization and 2-12% of ARTI that require intensive care treatment. The most affected population are infants aged less than six months. The severity of RSV infection in this period is related to the developmental immaturity of innate and adaptive immunity, manifesting as poorly protective and dysregulated immune response, leading to exaggerated inflammation, increased capillary permeability, bronchoconstriction and finally necrosis of the respiratory epithelial cells. The concomitant insufficiency of mucociliary clearance in this period of life leads to airway obstruction by thick mucus, resulting in increased airway resistance, hyperinflation and atelectasis. The purpose of our study was to evaluate the severity of RSV infection in the neonatal period, when it is supposed to have the heaviest burden.

METHODS

A retrospective epidemiological cohort study was performed on infants aged up to 44 post-conceptional weeks with acute viral lower respiratory tract infection, hospitalized in the neonatal department or neonatal intensive care unit (NICU) from September 2014 to April 2017. The primary outcomes were length of hospitalization, need for and length of NICU treatment, length of oxygen treatment and non-invasive or invasive ventilation. The secondary outcomes were atelectasis, apnea, bacterial superinfection, incomplete reconstitution and death.

RESULTS

During the study period, 104 infants with acute viral lower respiratory tract infection were hospitalized, 57 (54.8%) males and 47 (45.2%) females; 33 (31.7%) infants were premature. Their mean gestational age was 36.9 weeks (range 24-44) and mean birth weight was 3,052 g (range 570-4,760). Mean age at admission was 23.9 days (range 5-126). RSV was the most frequent causative virus, responsible for 78 (75.0%) cases. In 9 (8.7%) cases RSV and another virus were identified. Oxygen treatment was needed in 98 cases (94.2%), noninvasive ventilation in 36 (34.6%) and invasive ventilation in 32 (30.8%) cases. The mean length of hospitalization was 9.1 days (range 1-62), of oxygen treatment 5.9 days (range 0-45), of noninvasive ventilation 0.8 days (range 0-12) and of invasive ventilation 2.5 days (range 0-28). Atelectasis was present in 26 (25.2%) cases, apnea in 38 (36.5%), bacterial superinfection in 39 (38.2%), incomplete reconstitution in 30 (28.8%) and death in 1 (0.9%) case. RSV positive cases were more frequently premature ($p = 0.016$), had higher rate of apnea ($p = 0.006$) and incomplete reconstitution or death ($p = 0.002$).

CONCLUSIONS

RSV is a largely predominant causative agent of acute viral lower respiratory tract infection in infants and represents an important reason for hospitalization and intensive care treatment. Compared with other respiratory viruses it causes more apneas, incomplete reconstitutions and deaths.

ABS 20

ULTRASOUND VERIFICATION OF ENDOTRACHEAL TUBE POSITION IN NEONATES

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INTRODUCTION

Endotracheal intubation is a method of ensuring airway patency, which is the management of the endotracheal tube (ETT) in the trachea. One of the most common and potentially dangerous errors of this method is the incorrect position and displacement of ETT, which can lead to severe disturbances of gas exchange and the formation of ventilator-induced lung injury (VILI). The current methods for checking the position of the endotracheal tube in newborns have a number of significant disadvantages. The use of ultrasonic technique to determine the correct position of ETT in newborns has been described by a number of authors, but the technique is not optimized for routine use in NICU for newborns of different gestational ages and body weights at birth.

METHODS

The study examined a total of 52 newborns who underwent orotracheal intubation and endotracheal ventilation in the first week of life. We analyzed 52 X-ray images. The optimal position of ETT in radiography was taken above the Th3 level. We made 52 ultrasound scans which were carried out by doctors of the NICU. The scan used a high parasternal access to the right, with the child lying on his back. The main stage of the study was removal of the distal end of the ETT and the aortic arch and the measurement of the distance between them. The optimal value of this distance was considered to be 1.0-1.5 cm. To establish a linear relationship between the values obtained by different methods of verification of the depth of the ETT's tip, we performed a correlation analysis by Spearman.

RESULTS

The study included newborns with an average gestational age of 34.6 ± 4.2 weeks and a pronounced variation of anthropometric indicators: average body weight was $2,538.6 \pm 912.4$ g, average body length was 45.9 ± 9.1 cm, average diameter of ETT was 3.4 ± 0.4 mm, the average depth of standing ETT at the level of the angle of mouth was 87.3 ± 12.4 mm. The distal end of the ETT and the aortic arch were visualized and the distance between them was measured by ultrasound in 100% of cases. Identification of ETT position on the chest x-ray was also carried out for all newborns. The results of correlation analysis show a statistically high significant linear relationship between the indicators of the depth of standing ETT obtained using ultrasound and X-ray methods of visualizing the tip of the ETT ($r = 0.693$).

CONCLUSIONS

The ultrasonic verification of the ETT position is an accessible and minimally invasive method for newborns of any gestational age and birth weight, which makes it possible to reduce the number of X-ray examinations, radiation load and the number of invasive procedures on the newborn. This method can be applied easily by an anesthesiologist-

resuscitator and requires minimal skills in the use of ultrasound equipment.

ABS 21

ACQUIRED SUBGLOTTIC CYSTS IN PREMATURE INFANTS

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INTRODUCTION

Subglottic cysts are a rare condition of airway obstruction in premature infants and may develop many months following intubation.

METHODS AND RESULTS

We report 4 cases of acquired subglottic cyst that occurred in extremely premature infants requiring intubation in the early neonatal period for respiratory distress. The total duration of intubation varied from 1 day to 6 days. All 4 patients were extubated and were managed with nasal CPAP for a period of up to 4 months. Subsequently, after a period of 3 to 4 months, they developed signs of respiratory distress manifested as increased wheezing which progressed to biphasic stridor indicating upper airway obstruction. They underwent nasal endoscopy and a diagnosis of subglottic cyst was confirmed. In all 4 patients, the cysts were managed by endoscopic de-roofing excision of the cysts, with recurrence in one case. Subglottic cysts are most likely due to obstruction of mucus glands at the subglottic area and scarring caused by intubation. This condition should be considered and recognized in premature infants who develop recurrent infant wheezing and stridor.

CONCLUSION

Subglottic cyst is a rare complication seen more often in premature infants who underwent endotracheal intubation. The period of intubation may be relatively short, and signs of upper airway obstruction may develop over the following months. This entity is often misdiagnosed as chronic lung disease, bronchiolitis, or other respiratory conditions and managed accordingly until signs of significant airway obstruction occur. Therefore, it is important to identify this reversible condition in this vulnerable high-risk group early on, before the airway is significantly compromised. It is also important for health professionals to be aware of this rare but important complication in preterm infants who present with increasing respiratory distress in infancy.

ABS 22

CHRONIC LUNG DISEASE – RISK FACTORS AND IMMEDIATE OUTCOME

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INTRODUCTION

Any pulmonary disease resulting from a neonatal respiratory disorder is called chronic lung disease (CLD). Bronchopulmonary dysplasia (BPD) accounts for the vast majority of cases of chronic lung disease. BPD develops in newborns treated with oxygen and in need of respiratory support for a primary lung disorder. It remains the most prevalent and one of the most serious long-term sequelae of prematurity. The main objective of this paper is to assess the incidence, risk factors and short-term consequences of CLD in our Neonatal Intensive Care Unit (NICU).

METHODS

We performed a retrospective study over a period of 11 years (2007-2017) on infants that required invasive/non-invasive respiratory support in the Regional NICU at the Cuza-Vodă Clinical Hospital of Obstetrics and Gynecology, Iași, Romania. The diagnosis of BPD was made according to the 2001 NIH Consensus Conference on Bronchopulmonary Dysplasia. The following parameters were assessed: gestational age, birth weight, gender, initial respiratory condition, need for exogenous surfactant, type and duration of respiratory support, degree of CLD and outcome.

RESULTS

The incidence of CLD was 1.98% of all infants who received respiratory support. The study included 104 preterm infants who developed CLD, with a mean gestational age (GA) of 27.5 weeks and a mean birth weight (BW) of 978 grams. CLD had a higher incidence in male infants (61.5%). The initial respiratory condition was respiratory distress syndrome in 90 cases (86.5%) and congenital bronchopneumonia in 14 cases. 46.15% of cases needed exogenous surfactant administration. All infants needed invasive respiratory support and in 79.8% of cases it was necessary for more than 7

days. The severity grading of BPD revealed 45.2% of cases with mild BPD, 12.5% with moderate BPD and 42.3% with severe BPD. The short-term outcome was favorable in 86.5% of cases, with a mean hospitalization period of 81 days. Correlational analysis revealed a significant correlation of GA, BW and gender to the severity of CLD. There is a lack of correlation between initial respiratory condition, surfactant administration and the degree of CLD. Also, duration of invasive respiratory support and poor outcome during hospitalization in the NICU are associated with severe CLD. Multivariate analysis showed that the main risk factors for severe CLD are gestational age, inflammation and duration of invasive respiratory support.

CONCLUSION

Chronic lung disease is a complex condition, with multiple causes and difficult outcome. Involvement of invasive means of respiratory support, complementary therapies and the extensive duration of hospitalization are reasons why this condition represents a public health issue in NICUs worldwide.

ABS 23

CONGENITAL RHABDOMYOSARCOMA OF THE CHEST WALL

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INTRODUCTION

Rhabdomyosarcoma (RMS) is the most common soft tissue malignancy of childhood, but is very rare in the neonatal period. It may arise anywhere in the body, but it has a predilection for the head and neck area, genito-urinary tract and the extremities. Chest wall is a rare site for RMS. We report the case of a neonate with embryonal RMS arising from the posterior chest wall muscles at birth. The case is reported because of the extreme rarity of RMS in neonates and its unusual location in the chest wall.

CASE REPORT

A 28-year-old woman (gravida 2, para 2) underwent a routine ultrasound examination at 33 weeks' gestation and fetal ascites was observed. She was referred to a tertiary center and her serology (TORCH) was negative. At 34 GW, she gave birth to a female neonate (birth weight, 3,340 g; Apgar scores of 3, 4 and 7 at 1, 5 and 10 min, respectively) via planned cesarean section. The neonate was tracheally intubated soon after birth, and her heart rate gradually increased. Her abdomen was massively distended with palpable fluctuation, but no petechiae were detected. We performed drainage of ascites, about 530 ml over 4 days. The peritoneal

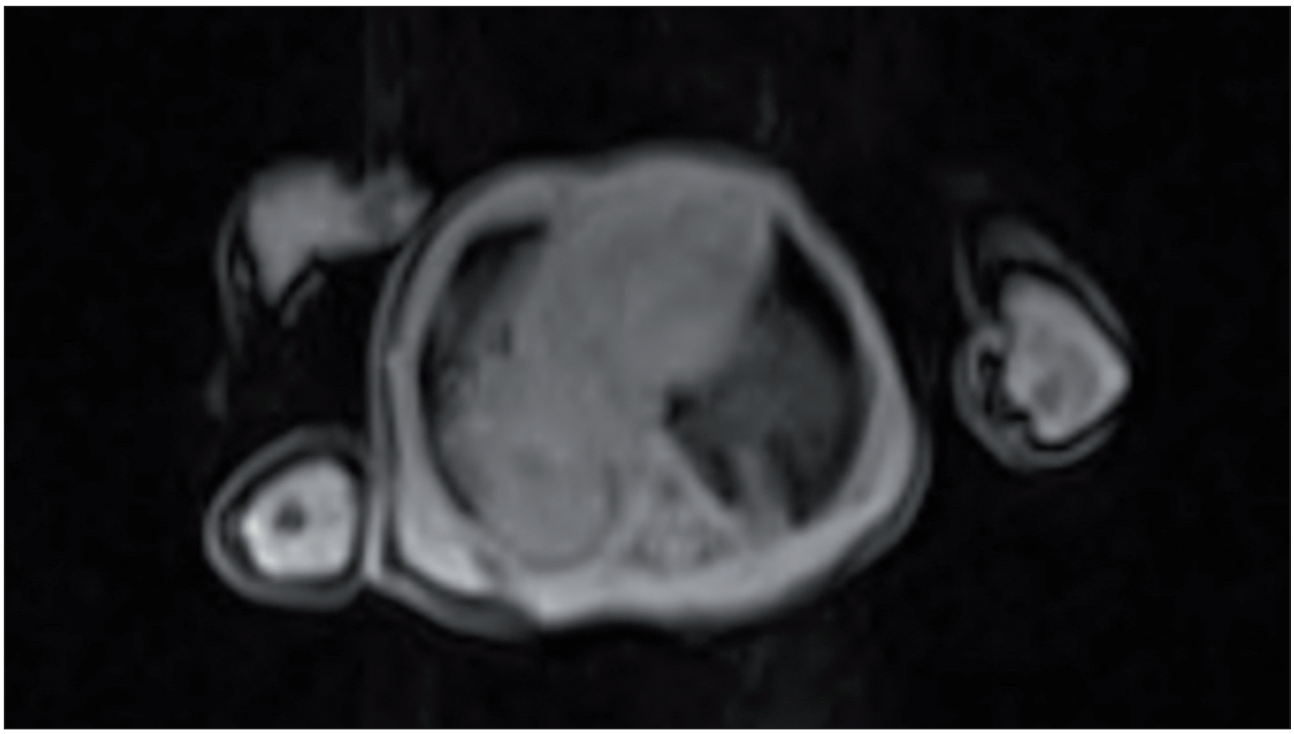

Figure 1 (ABS 23). MRT of chest: massive tumor in the right inferior part of the lung.

fluid which showed normal transudate signs, no malignant cells. A blood test showed anaemia (86 g/l), thrombocytopenia (120×10^9/l). After 3 days the newborn was extubated, her breathing was normal. However, respiratory distress was progressive at one week old, she needed CPAP therapy and FiO_2 – 1.0. At chest X-ray there was abnormal mediastinum and abnormal mass in the interior part of right lung, and after two days, the condition of the right lung worsened. We performed chest MRT, which showed probable intra-thoracic tumor with possible invasion of the abdominal wall (**Fig. 1**). Histological examination was performed, yielding a diagnosis of embryonal rhabdomyosarcoma. Metastasis was found in the diaphragm; no metastasis was found in the other organs. Surgical treatment was not possible, so we started chemotherapy with vincristine, actinomycin-D and cyclophosphamide (protocol CWS-2009).

CONCLUSIONS

The patient died after the first day of chemotherapy.

ABS 24

EPIDEMIOLOGY OF BRONCHIOLITIS IN NEWBORNS ADMITTED TO A TERTIARY CARE HOSPITAL – COMPARATIVE ANALYSIS 2006 VS 2016

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INTRODUCTION

Acute bronchiolitis (AB) is a relatively frequent respiratory disease in paediatric practice, with newborns at increased risk of severe disease that can require admission to the intensive care unit. Controversies persist with respect to the use of bronchodilators, corticosteroids and hypertonic saline. The aim of this paper was to analyze changes in epidemiological data in newborns with AB over a decade.

METHODS

We conducted a retrospective study of all newborns admitted to our institution over the period 2006-2016 with a diagnosis of AB at discharge. Data collection and analysis were performed with IBM® SPSS® Statistics version 22. A p-value < 0.05 was considered statistically significant.

RESULTS

From a total of 902 children admitted to our hospital for AB in 2006 and 2016, 25 were admitted within their first 28 days of life (6 in 2006 – 1.1% and 19 in 2016 – 5.2%, $p < 0.001$). In 2006, none were severe cases, whilst in 2016 8/19 (42.1%) had severe AB, with a M:F ratio of 2:1, which was noted also in the total sample of newborns – 17 M : 8 F. This age group had an OR 3.2 for ICU admission vs older children in the 902 patient sample ($p = 0.012$). In 2016 rapid diagnostic tests for respiratory syncytial virus (RSV) and adenovirus became available and these viruses were identified in 8 and 1 cases respectively, with one patient having an RSV – *Streptococcus pneumoniae* co-infection who had severe AB. Therapeutic options included oxygen (O_2 – in 11/25 – 44% of the cases, all in 2016), hypertonic saline (5/25 – 20%), nebulized adrenaline (21/25 – 84%, in 2006 in 66.7% and in 2016 in 89.5%) and salbutamol only 1/25 patients. Inhaled ipratropium was used only in 3 cases in 2016, corticosteroids were used in 2/6 cases – 33.3% in 2006 and in 4/19 cases – 21.1% in 2016 – with intravenous dexamethasone being replaced by hydrocortisone in 2016. Antibiotics continued to be used in a large proportion of patients in both periods (18/25 – 72%), with a non-significant decrease, from 5/6 – 83.3% in 2006 to 13/19 – 68.4% in 2016. Nevertheless, we noted a significant reduction in the use of antibiotics prior to admission to hospital – 5/6 – 83.3% in 2006 vs 4/19 – 21.1% in 2016 ($p = 0.012$). None of the patients required mechanical ventilation and there were no fatalities. Overall, over the ten-year period, significant changes were noted only in the use of O_2 – which increased ($p = 0.017$).

CONCLUSIONS

Within the space of a decade, an increased number of newborns have been admitted to our hospital, with more severe forms of AB in comparison with other age groups. Although antibiotics are less used prior to admission, improved availability of diagnostic tests has not yet been matched by a decrease in antibiotic use in the hospital. Controversial therapeutic options continued to be used in our patients, in spite of existing guidelines.

ABS 25

IMPACT OF ANTENATAL FACTORS ON SURVIVAL WITHOUT BRONCHOPULMONARY DYSPLASIA OUTCOME

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INTRODUCTION

Bronchopulmonary Dysplasia (BPD) is one of the main morbidities associated with preterm birth whose incidence continues to increase despite improvement in perinatal care. The aim of this study is to estimate the impact of antenatal factors: gestational age (GA), gender, complete course of antenatal steroids and histologic analysis of the placenta, in the survival without bronchopulmonary dysplasia outcome (SF-BPD).

METHODS

Observational study of all preterm infants born with less than 32 weeks GA admitted to our institution from January 2012 to December 2017. Perinatal data (GA in weeks, Gender, Complete course of antenatal corticosteroids) were recorded. The histopathology

Table 1 (ABS 25). Antenatal factors according to survival without bronchopulmonary dysplasia and gestational age in groups. Logistic regression analysis.

SF-BPD 2-3		No	Yes	p
Gender	Male	129 (35.8%)	231 (64.2%)	0.303
	Female	82 (31.8%)	176 (68.2%)	
Antenatal steroids	No	90 (39.3%)	139 (60.7%)	0.044
	Yes	121 (31.2%)	267 (68.8%)	
GA (weeks), median (IQR)		26.3 (24.8-28.1)	29.5 (28.1-31.0)	< 0.001
Placental histology	Vascular disease	35 (22.9%)	118 (77.1%)	< 0.001
	Inflammatory	46 (29.7%)	109 (70.3%)	
	Normal	68 (45%)	83 (55%)	
	No analyzed	61 (39.6%)	93 (60.4%)	

Gestational age in groups		< 26	26-29	30-32	p
Placental histology	Vascular disease	19 (16.4%)	62 (28.1%)	73 (26.2%)	< 0.001
	Inflammatory	57 (49.1%)	55 (24.9%)	39 (14%)	
	Normal	26 (22.1%)	58 (26.2%)	71 (25.4%)	
	No analyzed	14 (12.1%)	46 (24.9%)	96 (34.4%)	
Antenatal steroids		54 (46.2%)	143 (64.4%)	191 (68.7%)	< 0.001
Gender (female)		51 (43.6%)	86 (38.7%)	121 (43.4%)	0.524
Exitus		57 (48.7%)	21 (9.5%)	9 (3.2%)	< 0.001
SF-BPD		22 (18.8%)	139 (62.3%)	246 (60.4%)	< 0.001
BPD	Type 0	1 (0.4%)	45 (17%)	219 (82.6%)	< 0.001
	Type 1	21 (35%)	94 (46.8%)	27 (10%)	
	Type 2	23 (38.3%)	44 (21.9%)	20 (7.4%)	
	Type 3	15 (25%)	18 (9%)	4 (1.5%)	

Logistic regression			OR	95% CI		p
Gender (female)			1.199	0.854	1.683	0.295
Antenatal steroids		< 26 w GA	5.33	1.812	15.679	**0.002**
		26-29 w GA	0.568	0.316	1.023	0.06
		30-32 w GA	0.842	0.371	1.909	0.68
Increasing GA (weeks)		Antenatal steroids	1.732	1.526	1.965	**< 0.001**
		No antenatal steroids	2.415	1.946	2.997	**< 0.001**
Placental histology (compared to normal)	< 26 w GA	Inflammatory	2.044	0.524	7.975	0.303
		Vascular disease	2.738	0.565	13.267	0.211
	26-29 w GA	Inflammatory	0.603	0.266	1.367	0.226
		Vascular disease	0.201	0.091	0.442	**< 0.001**
	30-32 w GA	Inflammatory	1.27	0.364	4.427	0.707
		Vascular disease	1.032	0.384	2.772	0.95

SF-BPD: survival without bronchopulmonary dysplasia outcome; GA: gestational age.

of the placenta was revised and classified as: normal, inflammatory or vascular disease as defined by Redline et al. [1]. The diagnosis of BPD included type 2-3 by physiologic definition [2] and survival was considered at discharge.

RESULTS

618 preterm infants were admitted to our institution in this period. 87 patients (14%) died during hospitalization. There were 37 patients with BPD type 3 (7%); 87 type 2 (16.4%); 142 type 1 (26.7%) and 265 no BPD (49.9%). A total of 407 (65.9%) patients survived without BPD 2-3 diagnosis. Prenatal characteristics by SF-BPD status and gestational age in groups are shown in **Tab. 1**. Logistic regression analysis showed an interaction of GA with antenatal steroids and placental histology. Antenatal steroids increased SF-BPD in less than 26 w GA infants (OR 5.33, 95% CI 1.812-15.679, p 0.002) and placental vascular disease decreased it in the group of infants born at 26 to 29 w GA (death or BPD 2-3 outcome: OR 4.976, 95% CI 2.26-10.956). Applying a predictive regression model, GA, antenatal steroids treatment and placental histology can explain 42% of the variability in the SF-BPD outcome in less than 32 w GA preterm infants (AUC 0.883, 95% CI 0.828-0.937, $p < 0.001$).

CONCLUSIONS

Prenatal factors have an important impact on mortality and BPD outcome that may differ depending on the stage of fetal development.

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ABS 26

OUTCOMES OF INHALED NITRIC OXIDE AS RESCUE THERAPY IN PRETERM NEONATES

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INTRODUCTION

Inhaled nitric oxide (iNO) is an effective and well-established therapeutic adjunct in the management of persistent pulmonary hypertension in term neonates. Its role in preterm neonates (< 34^{+0} weeks), however, remains controversial and lacks compelling data. We have previously published our iNO treatment data in preterm neonates over a 5-year period showing high mortality [1] (2009-2014). In the published data, 42 babies received iNO with an overall mortality of 50%.

AIM

To review the recent outcomes of preterm neonates (2 days).

RESULTS

The overall mortality in the study cohort was 19%; it was higher in the early (21%) versus the late (17%) treatment group. All the neonates > 30^{+0} weeks who died received iNO treatment early (≤ 2 days of birth).

CONCLUSION

Compared to previously published local data, more preterm neonates are being treated with iNO. Although mortality rates are high in the study cohort, they are lower than in the previous study period. Overall, more studies are required to determine the potential benefits of iNO as a rescue therapy in preterm neonates.

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ABS 27

POTENTIAL USE OF N-ACETYLCYSTEINE IN NEONATOLOGY

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INTRODUCTION

Oxidative stress and cytokine production are important factors in the pathogenesis of a wide spectrum of diseases in the neonatal period. Free radicals and cytokines mutually strengthen their production, thus leading to stronger inflammatory response and tissue damage. N-acetylcysteine (NAC) is well-known for its antioxidant properties. However, new studies suggest it may

also have anti-inflammatory effect. Putting these two characteristics together, NAC may constitute an effective intervention in cessation of a proinflammatory cascade responsible for organ damage in the neonatal age.

METHODS

For data collection, electronic searching of databases such as PUBMED, EBSCO and PROQUEST CENTRAL were used. The Search for information started in September 2016 and ended in May 2018. Articles accepted in journals after 2010 were preferred.

RESULTS

Experimental and clinical studies suggest that NAC may be effective in all diseases involving free radicals and cytokine production. Nowadays, attention targets the central nervous system where NAC is used as a neuroprotective agent, especially in newborns exposed to systemic inflammation or hypoxic-ischemic insult. Potential benefit of NAC may be seen in IRDS as well when respiratory effort is inadequate and mechanical ventilation and oxygen therapy are needed. The excessive production of free radicals and cytokines leads to a progressive course of tissue damage and surfactant inactivation. The effect of NAC is surveyed in neonatal ARDS too. This condition is marked by respiratory failure due to secondary surfactant inactivation by inflammatory process. NAC seems to be a promising agent in the treatment of meconium aspiration syndrome where a combination of NAC and surfactant is more effective in improving respiratory functions than NAC or surfactant alone. Research of potential use of NAC in neonatology is extended to other organ systems as well; however more studies are needed in this area. It seems its prophylactic administration may lower the incidence of necrotising enterocolitis, congenital heart disease in mothers with pregestational diabetes mellitus, stress ulceration of the gastric mucosa. NAC may also serve as an adjuvant therapy in acute renal injury after hypoxic or endotoxic insult as well as in the prevention of retrograde motor neuron death after brachial plexus injury. In all experimental studies or clinical trials no adverse events were described regarding systemic NAC administration.

CONCLUSION

At present, the use of NAC in neonatology is limited to mechanically ventilated patients where it serves as a mucolytic agent. However, recent studies suggest that thanks to its antioxidant and anti-inflammatory properties N-acetylcysteine may be effective as an adjuvant therapy in a wide range of diseases in the neonatal age, leading to lower mortality and morbidity rates as well as to better quality of life.

ABS 28

RESPIRATORY DISTRESS IN A NEWBORN DUE TO A RARE NASAL OBSTRUCTION

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BACKGROUND

Congenital nasal pyriform aperture stenosis (CNPAS) is a rare cause of nasal airway obstruction in neonates. It is often characterised by episodic apnea and cyclical cyanosis; timely recognition is important to prevent fatal outcome. The diagnosis is confirmed by imaging findings and this anomaly may be associated with craniofacial anomalies, hypopituitarism and abnormal karyotype.

CASE REPORT

Female newborn from spontaneous delivery at 40 weeks of gestational age, to non-consanguineous parents, Apgar score 9-10. Appropriate for gestational age. At eight hours of life she presented noisy breathing with mild nasal obstruction; nasogastric tube was passed nasally with mild difficulty bilaterally; despite conservative treatment with saline solution, respiratory distress occurred. Although clinical improvement was achieved with non-invasive ventilation she required intubation due to recurrent episodes of apnea with hypoxemia starting from day four of life (D4). No other physical changes were noted. A craniofacial computed tomography scan revealed marked narrowing of the anterior nasal passage compatible with CNPAS and a solitary median maxillary central incisor. Cerebral ultrasound with periventricular calcifications. Laboratory studies were negative for sepsis and cytomegalovirus screening. Thyroid function tests, cortisol level and karyotype were normal as well as cardiac and abdominal ultrasonography. Due to failure to pass a 5 French catheter through the nasal airway on D7, surgical management was required. Excess bone was drilled away from the anterior maxilla and endotracheal tubes were fashioned as nasal stents until D35. No respiratory support

was needed from D15 and she had exclusive oral breastfeeding at D35.

DISCUSSION

Newborns are uniquely nasal breathers; therefore, a severe nasal obstruction may become a life-threatening condition; early recognition is vital to avoid respiratory failure. CNPAS should be considered in the differential diagnosis whenever there are signs of upper airway obstruction. It is important to increase awareness among pediatricians and neonatologists about this rare condition.

ABS 29

RISK FACTORS FOR RESPIRATORY DISTRESS IN LATE PRETERM INFANTS

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INTRODUCTION

Changes in maternal demographics and obstetrical management have led to an increased number of infants born late preterm. Physiological immaturity is the main cause of the diminished ability of the late preterm infant (LPI) to adapt to extrauterine life and of the increased incidence of postnatal complications. Respiratory difficulties are more often diagnosed in late preterm infants, complicating the postnatal course. The aim of the study was to identify risk factors for respiratory distress (RD) in LPI.

MATERIAL AND METHODS

All LPIs admitted to our level III regional unit between 2013 and 2017 were included in the study. Epidemiological data, neonatal characteristics, data on delivery and perinatal complications were retrieved from neonatal charts. Comparisons were performed between LPIs with RD and those without respiratory conditions. Statistical analysis was performed using SPSS® for Windows® 19.0, p results were considered statistically significant if < 0.05; OR were calculated were appropriate.

RESULTS

The study group comprised 808 LPIs, of whom 182 infants were diagnosed with RD (22.52%). Transient tachypnea was diagnosed in 176 LPIs (96.7%), hyaline membrane disease in 4 cases, pneumonia in 2 cases. As regards severity, RD was classified as minor (requiring only oxygen) in 51 cases (28%), medium (treated with CPAP support) in 114 cases (62.6%), and severe (needing mechanical ventilation) in 17 LPIs (9.4%). RD was associated with lower gestational age and birth weight ($p < 0.001$), male gender ($p = 0.009$; OR 1.10 [1.02-1.19]), lower Apgar scores at 1 and 5 minutes ($p < 0.001$), need for resuscitation at birth ($p < 0.001$; OR 3.98 [3.20-4.94], delivery by C-section ($p = 0.003$: OR 1.64 [1.18-2.30]), C-section in absence of labor ($p < 0.001$; OR 1.83 [1.38-2.42]), anemia at birth ($p < 0.001$; OR 1.77 [1.44-2.20]), lower levels of hemoglobin at birth ($p < 0.001$), persistence of ductus arteriosus ($p = 0.001$; OR 1.50 [1.19-1.90]), more frequently associated complications ($p < 0.001$; OR 1.45 [1.22-1.73], and increased duration of hospitalization ($p < 0.001$). As expected, LPIs with RD were more often admitted to the NICU ($p < 0.001$; OR 2.40 [2.07-2.77]) but there was no significant difference in the length of hospitalization in the NICU ($p = 0.348$). No significant differences were found as regards maternal characteristics, type of pregnancy (single versus twins, natural versus ART, presentation, maternal-fetal infections, and death.

CONCLUSIONS

Almost 1 in 4 infants developed respiratory difficulties and although in most of the cases transient tachypnea, mild or moderate, was diagnosed, our results suggest that this is increasing the complication rate and duration of hospitalization. As previously shown in the literature, male gender, lower gestational age and birth weight, elective C-section, especially in the absence of labor, and birth asphyxia are associated with increased risk of RD in LPIs. Anemia at birth, as shown by our data, is also associated with increased risk for RD in LPIs.

ABS 30

STRANGE COMPLICATION IN NEONATAL RESUSCITATION. UNEXPECTED CASE OF TRACHEAL ATRESIA

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INTRODUCTION

Tracheal atresia (TA) is a rare congenital anomaly, incompatible with life, that requires unexpected and emergency resuscitation. Its incidence ranges between 1:50,000/100,000 live births, male: female ratio 2:1. The diagnosis is often post-mortem. Affected infants usually present as a medical emergency at birth with severe respiratory distress, absence of audible crying and difficult or impossible endotracheal intubation, leading to failed airway management. A concomitant tracheo- or bronco-esophageal fistula is often seen, and its presence allows resuscitation and ventilation through esophageal intubation. Vertebral, anal, cardiovascular, tracheo-esophageal, renal and limb anomalies may also be associated.

CASE REPORT

We describe a baby with this lethal anomaly who died soon after birth. Male newborn, weight 2,610 g, delivered by emergency caesarean due to placental detachment at 37 weeks. A neonatologist attended the birth due to severe placental bleeding and the known polyhydramnios. The infant was severely depressed, with pale cyanosis and a 1-min Apgar score of 1. He required mask ventilation and endotracheal intubation performed using a 2.5 mm tube, given the impossibility of using a bigger tube and with significant difficulty in introducing it for more than 3 mm under the vocal cord plane where an obstruction was seen. Persistent hypoxemia and bradycardia required two courses of CPR and intravenous administration of adrenaline through the umbilical vein. No clinical signs of pulmonary ventilation were obtained. Invasive ventilation with HFOV was attempted but oxygen saturation never reached values over 40%. At 30 minutes of life the baby died. No other macroscopic anomalies were detected. Autopsy was performed and confirmed an isolated TA. We found a total loss of cartilage and connective tissue in the whole segment between the larynx and tracheal bifurcation. The two principal bronchi were connected to each other but not to the larynx. No fistula to the esophagus or other malformations were found (**Fig. 1**).

DISCUSSION

Overall, TA has a very poor prognosis. In the presence of an esophageal-bronchial fistula, the infant can be stabilized by bag mask-ventilation and esophageal intubation. In some cases, emergency tracheotomy has been performed, but the procedure

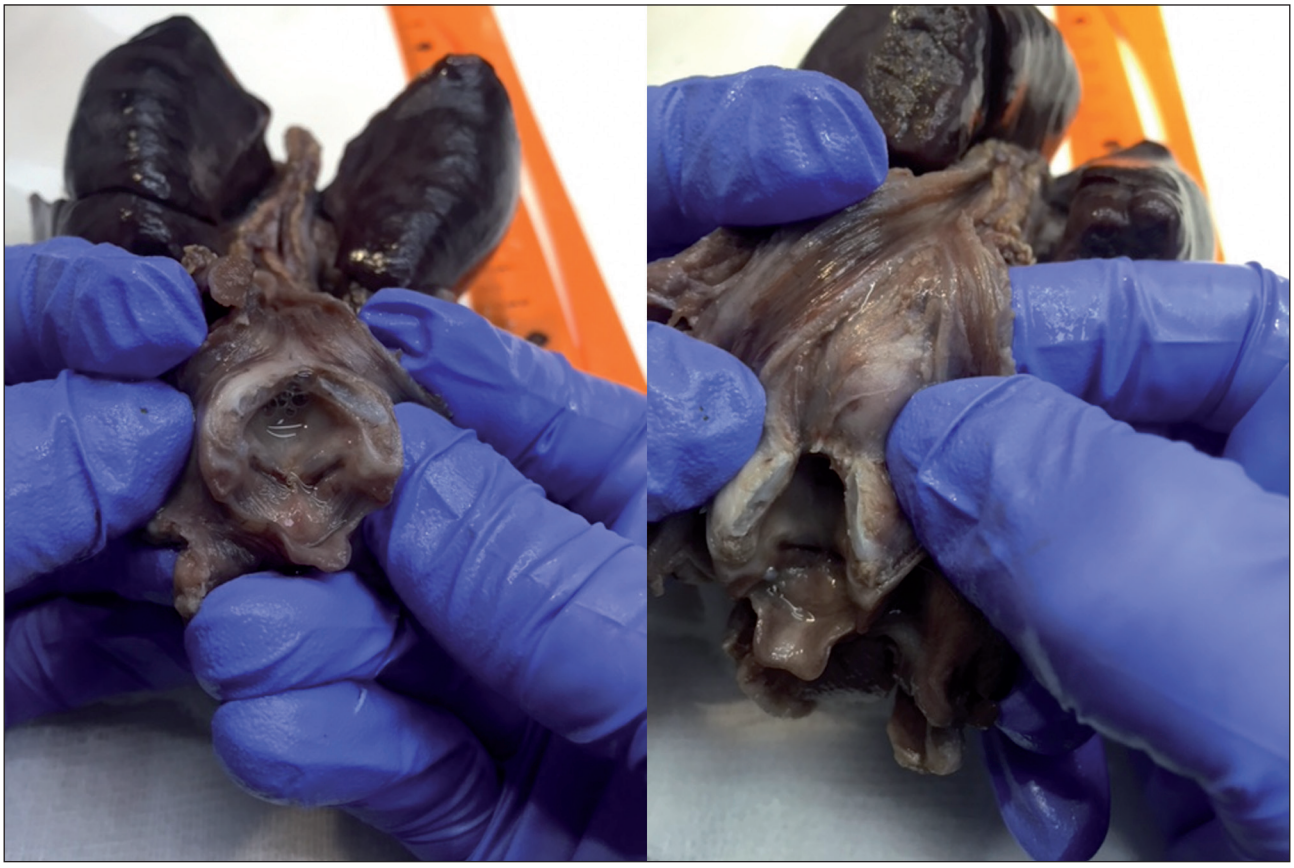

Figure 1 (ABS 30). Autoptic piece showing isolated tracheal agenesis with total loss of cartilage and connective tissue along the whole segment between the larynx and the tracheal bifurcation.

is seldom adopted and is complex. Even if in our baby there was no esophageal-bronchial fistula, prenatal diagnosis was not achieved. This is because diagnosis is usually difficult in the presence of a fistula, while in its absence, Congenital High Airway Obstruction Syndrome (CHAOS) can be diagnosed (polyhydramnios, fetal hydrops, hyperechogenic enlarged lungs, a flattened or inverted diaphragm and a fluid-filled dilated airway distal to the obstruction). In the context of unexplained polyhydramnios associated with congenital malformations, a suspicion of TA should be raised. In these cases, exploration of the airway by fetal MRI should be considered in order to plan a safe delivery and anticipate difficult airway management.

ABS 31

THE EFFECTS OF PROPHYLACTIC VERSUS SELECTIVE USE OF SURFACTANT ON MORTALITY AND MORBIDITY IN PRETERM INFANTS: A META-ANALYSIS

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INTRODUCTION

Surfactant therapy is widely used to prevent or treat respiratory distress syndrome (RDS) in preterm infants. As advances are made in perinatal care, such as antenatal steroid use and early application of nasal continuous positive airway pressure (nCPAP), there is a concern that surfactant is administrated even to infants who will not go on to develop RDS. The aim was to compare the effect of prophylactic and selective use of surfactant in preterm infants by a systematic meta-analysis.

METHODS

Relevant studies were identified by database searches in MEDLINE, EMBASE, CENTRAL and the Korean database, up to June 2017. Primary outcomes were mortality and bronchopulmonary dysplasia (BPD). The following morbidities before discharge were analyzed; air leak disease, pulmonary hemorrhage, patent ductus arteriosus, sepsis, necrotizing enterocolitis, intraventricular hemorrhage, periventricular leukomalacia, retinopathy of prematurity, pulmonary hypertension, pneumonia.

RESULTS

Out of 16 identified studies, there were 12 randomized controlled trials (6,544 patients) and 4 non-randomized controlled studies (884 patients). 12 studies reported antenatal steroid use, 4 studies reported more than 50% of antenatal steroid use. 5 studies reported the application of nCPAP. Selective use of surfactant increased neonatal mortality (RR 1.33, 95% CI: 1.10-1.60, p = 0.008) and the combined outcome of neonatal mortality and BPD (RR 1.16, 95% CI: 1.03-1.30, p = 0.01). However, there were no significant differences between prophylactic and selective use of surfactant in these outcomes in the subgroup with more than 30 weeks gestation, more than 50% antenatal steroid use, and nCPAP application. There were no significant differences in other morbidities between prophylactic and selective use of surfactant.

CONCLUSIONS

In preterm infants at risk of RDS, prophylactic use of surfactant prevents neonatal mortality and BPD. However, selective use of surfactant may be considered in cases of more than 30 weeks gestation, antenatal steroid use and the early application of nCPAP.

ABS 32

THE STUDY OF FREE RADICAL OXIDATION PROCESSES IN NEWBORNS WITH ACUTE RESPIRATORY FAILURE

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INTRODUCTION

Acute respiratory failure is one of the most frequent clinical signs of critical conditions of various origin in newborns encountered in the practical work of intensive care units. In spite of considerable development of the technologies for the treatment of acute respiratory failure in newborns, the problem remains urgent and unsolved to some extent; this is connected with difficulties in diagnosis, absence of specific characteristic clinical symptoms as

well as the development of acute respiratory failure in newborns on the background of other, extrapulmonary pathology.

MATERIALS AND METHODS

The main group of the research included 45 newborns with respiratory disorder syndrome on the foundation of various neonatal pathologies. The control group included 15 fairly healthy children who were undergoing rehabilitation observation in the department of postnatal pathology. Study of changes in oxidative status in the lungs was performed in exhaled breath condensate since this method is non-invasive, which is especially important in neonatal practice.

RESULTS

Examination of the level of protein carbonyls in lung expirates of both groups found double the increase in protein peroxide oxidation in newborns with acute respiratory failure (2.35 ± 0.15 mmol/g of protein) in comparison with the control group (1.15 ± 0.08 mmol/g of protein, $p < 0.001$). Increase in malone dialdehyde level was also found (main group – 1.35 ± 0.1, control group – 0.6 ± 0.03 nmol/mg of protein, $p < 0.001$) which is indicative of the activation of lipid peroxide oxidation in newborns with acute respiratory failure. Our results indicate that peroxidation of proteins occurs simultaneously with the process of lipid peroxidation, which is confirmed by correlation analysis between the indicators of the maintenance protein carbonyl groups and malone dialdehyde ($r = 0.381$, $p = 0.034$).

CONCLUSIONS

Newborns with acute respiratory failure of the parenchymatous type in critical conditions develop activation of the processes of free-radical oxidation and, as a result, initiation of lipid and protein peroxide oxidation.

ABS 33

ULTRASOUND DIAGNOSIS OF AIR LEAK SYNDROME IN NEONATES

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INTRODUCTION

Chest x-ray is a common diagnostic method of detecting air leak syndrome in neonates. Radiologic exposure in the neonatal period can lead to long-term effects. The most important of them is increased risk of malignancies. Lung ultrasound (LUS) is an accurate and safe tool to diagnose pneumothorax (Ptx) and pulmonary interstitial emphysema (PIE) but there are few studies assessing the efficacy of LUS examination to detect these conditions in neonates. The purpose of our study is to assess the accuracy of LUS in detecting PIE and Ptx in neonates.

METHODS

This was a prospective, single-centre, observational study conducted at the Morozovskaya Children's Clinical Hospital (Moscow, Russia). 76 neonates were admitted to the neonatal intensive care unit because of respiratory distress. They underwent LUS and chest radiography 2-11 times in NICU because of the clinical purpose. Investigations were made by a highly qualified ultrasound specialist and a pediatric radiologist who were blinded to the results of other methods. The gestation age of neonates was 27 [26, 31] w (23-40 w), body weight 1,050 [830, 1,440] g (470-4,520 g). LUS was made by liner 6-15 MHz transducer via Loqic S8 ultrasound machine, anterior, lateral and posterior areas of the chest were scanned.

RESULTS

7 patients had Ptx, 2 of them had tension Ptx and 5 neonates had non-tension Ptx. In all 7 cases, the lung point was visualized (**Fig. 1**). In non-tension Ptx of minimal volume (3 cases) the lung point was located in the anterior subdiaphragmatic area at the level of the midclavicular line, in larger non-tension pneumothorax (2 cases) the lung point was located at the level of anterior axillary line. In tension pneumothorax (2 cases) the lung point was located at the level of the scapular line. In all cases we detected A-lines and absence of B-lines and lung sliding. On the chest x-rays pneumothorax was visualized in all cases, the decision regarding its volume was made according to radiographic data. In patients with PIE we visualized small hyper-echogenic foci surrounded by hypo-echoic areas. This pattern was detected in 15 patients, in 5 of them foci of emphysema were revealed also via computed tomography and in 5 of them diagnosis was confirmed on autopsy.

CONCLUSIONS

Lung ultrasound is a feasible diagnostic tool in the detection or ruling out of Ptx in neonates. The location of the lung point can help to assess the volume of Ptx. Pulmonary interstitial emphysema has a characteristic ultrasound pattern and can

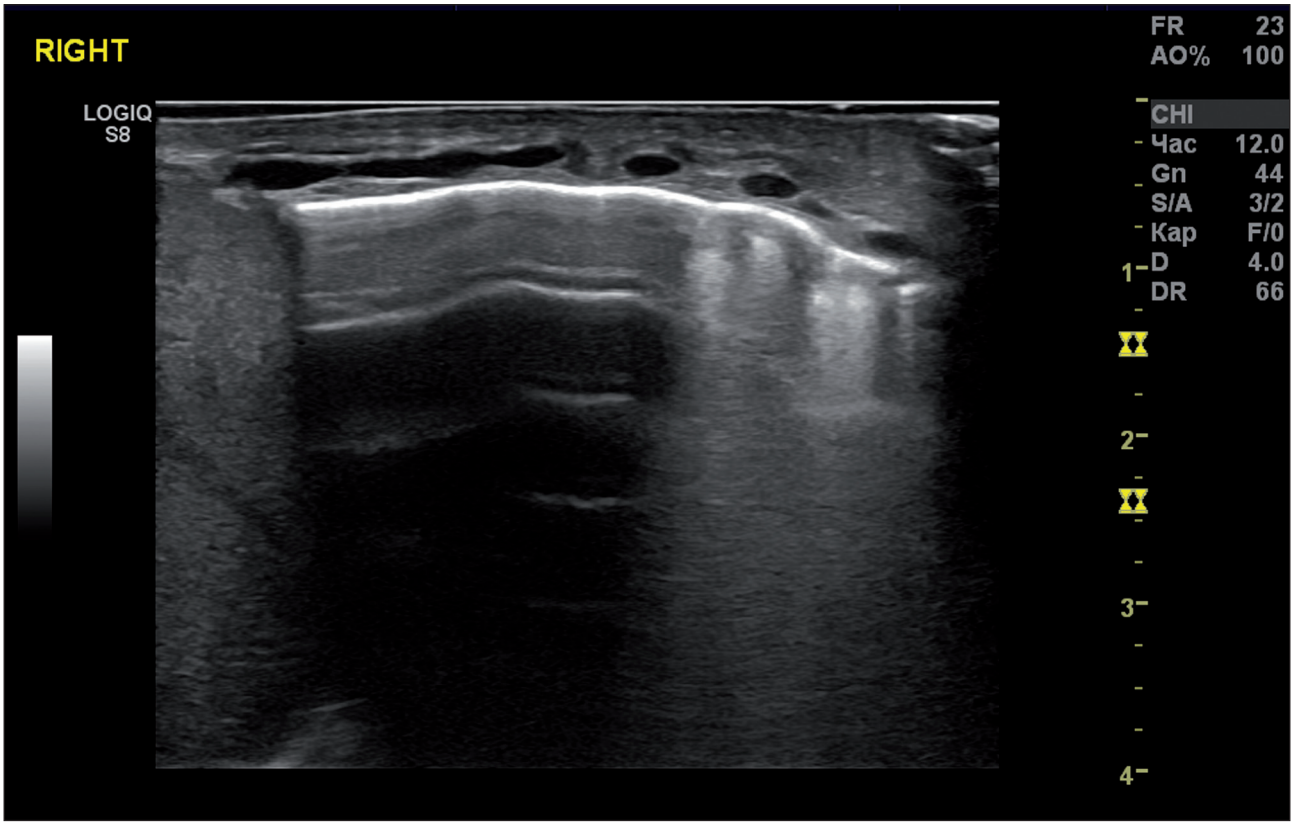

Figure 1 (ABS 33). Lung ultrasound (LUS) image of lung point in a patient with pneumothorax.

be easily diagnosed by LUS. Randomized controlled trials involving nonqualified operators (neonatologists) are required to implement LUS in routine clinical practice.

ABS 34

A RARE CASE OF GASTROINTESTINAL BLEEDING: NEONATAL HEMOCHROMATOSIS

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INTRODUCTION

Neonatal hemochromatosis is a rare disease with a prevalence of < 1/1,000,000, of probable allo-immune etiology marked by severe hepatic dysfunction occurring *in utero* or in the early neonatal period. Its outcome is often fatal. We report a case of a female neonate who shortly after birth presented coffee ground vomiting and gradual liver and renal failure. Neonatal hemochromatosis was confirmed post mortem.

CASE REPORT

A female neonate was born by caesarean section due to oligohydramnios and intrauterine growth restriction. A few hours after birth she presented coffee ground vomiting not responding to treatment. The baby gradually developed respiratory distress, severe renal and liver failure with ascites. Repeated gastrointestinal hemorrhages were associated, which needed multiple blood transfusions and recombinant factor VIIa administration. Laboratory tests revealed renal failure, hypo-calcemia, high ferritin levels, coagulopathy and hypo-albuminemia, cholestasis and limited cytolysis. Ultrasound showed fluid in the abdomen and hepatosplenomegaly. Due to uncontrolled pulmonary hemorrhage the patient died on day 5. Post-mortem studies revealed severe hepatic lesions with cirrhosis. Histopathology showed deposition of iron in the hepatocytes, Kupffer cells, pancreatic and kidney cells. Based on the findings, the diagnostic of neonatal hemochromatosis was established.

RESULTS

Neonatal hemochromatosis should be suspected in all neonates with antenatal or postnatal signs

of severe liver disease. Current care of neonatal hemochromatosis is basically supportive. General support care of nutrition and replacement of hematologic factors are necessary. A combination of i.v. IgG, antioxidants, cryoprotective agents and chelation is used to extend survival time, but currently the only curative treatment is liver transplant, as studies have shown that iron does not redeposit after transplantation.

CONCLUSION

Acute liver failure is a relatively rare condition in neonates, and early diagnosis and treatment are crucial for treatable conditions. Early diagnosis and correct management may help to improve the survival rate.

ABS 35

EFFICACY OF SURFACTANT REPLACEMENT THERAPY IN LATE PRETERM AND TERM NEONATES WITH RESPIRATORY DISTRESS

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INTRODUCTION

Respiratory distress syndrome is a common condition in neonates at any gestational age. Surfactant therapy is widely supported by the literature in respiratory distress in premature newborns but is less standardized in the late preterm or term newborns. Perinatal aspiration syndrome, respiratory distress syndrome (RDS), pneumonia/sepsis and pneumothorax are the most common lung diseases in term and late preterm neonates. We hypothesized that the use of surfactant, either alone or in combination, would improve evolution and decrease the risks of complications or death.

MATERIAL AND METHODS

The retrospective study was conducted in the Department of Neonatology I, Cluj in the period 2014-2017. The study group consisted of 30 cases of newborns aged between 34-42 weeks of gestation. We analyzed the types of resuscitation in the delivery room, FiO_2 required before and after surfactant replacement, Apgar score, type of respiratory support, Astrup parameters in dynamics, time management of surfactant and PaO_2/FiO_2 ratio before and after the administration of surfactant. We performed the statistical analysis with SPSS®. An informed consent was signed for all patients.

RESULTS

The study group was represented by 30 cases with gestational age (GA) of 36 ± 2.03 weeks and birth weight (BW) 2,645.33 ± 583.33 g. Respiratory pathology was represented by congenital pneumonia, meconium aspiration syndrome and pneumothorax. The Apgar score was 7.79 ± 2.00 at 1 minute and 8.39 ± 1.25 at 5 minutes with no statistical differences between the pathologies. The severity of respiratory distress was 5.89 ± 3.00, quantified by the Silverman score. The mean age at administration of the surfactant was 18.5 hours of life. Overall Astrup parameters were improved after administration of surfactant; the pH improved significantly after surfactant replacement in all pathologies of our study ($p = 0.001$) from 7.15 ± 0.15 to 7.27 ± 0.35; PO_2 also increased from 47.13 ± 15.12 to 53.26 ± 13.12; PCO_2 decreased with significant differences ($p = 0.001$). Oxygen saturation also improved significantly ($p = 0.02$). The need for oxygen decreased significantly from 57% to 30% after surfactant replacement ($p = 0.001$). The PaO_2/FiO_2 ratio increased significantly after administration of surfactant from 0.85 to 1.65 ($p = 0.0093$) in all the cases.

CONCLUSIONS

The administration of surfactant decreased the need for oxygen and increased oxygen saturation and the PaO_2/FiO_2 ratio in the cases with pneumonia, pneumothorax and meconium aspiration syndrome with respiratory failure. Overall, the Astrup parameters were improved after surfactant replacement. Surfactant administration in late preterm and term newborns with respiratory distress is delayed compared to the standard therapy of premature infants – at 18.5 hours after birth.

ABS 36

PERINATAL RISK FACTORS FOR BRONCHO-PULMONARY DYSPLASIA AND DEATH IN VERY PRETERM INFANTS

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INTRODUCTION

Despite significant advancements in neonatal medicine, infants less than 32 gestational weeks represent a high-risk group for developing bronchopulmonary dysplasia (BPD) and death outcome. The development of BPD is the result of the complex interactions between multiple perinatal and postnatal factors. Early identification of risk factors may allow a targeted approach aimed at reducing BPD and death in the future. Our aim is to determine perinatal risk factors for developing BPD and death in infants less than 32 weeks of gestational age.

METHODS

This study enrolled 153 newborns less than 32 gestational weeks, of whom 29 died (death outcome group), 28 developed BPD (BPD group) and the remaining 96 made up the control group. BPD was defined as a need for additional oxygen at 36 weeks of postmenstrual age. Details including gestational age, sex, birth weight, prenatal steroids, chorio-amnionitis, Apgar score, hypotension, pH, excess base after birth, surfactant treatment, ventilatory support, early onset sepsis, air leaks, patency of ductus arteriosus, IL-6 in the first six hours after birth were collected.

RESULTS

In our study, the mortality rate was 21.57%, prevalence of BPD was 18.3%, but twice as frequent in male infants. Early onset sepsis, pneumothorax, patency of ductus arteriosus and IL-6 were significantly associated with death outcome. Resuscitation at birth, prolonged mechanical ventilation, late onset sepsis, multiple doses of the surfactant, pulmonary bleeding were major significant factors for developing BPD.

CONCLUSIONS

In our cohort of infants of gestational age < 32 weeks, severe RDS and late onset sepsis are predictive for BPD while early onset sepsis is associated with death outcome.

ABS 37

PNEUMOPERICARDIUM AND CARDIAC TAMPONADE IN A PRETERM NEONATE. A CASE REPORT

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INTRODUCTION

Pneumopericardium (PPC) is the least common form of pulmonary air leak in the neonatal period, but it is associated with very high mortality (72-83%). It is a well-known complication of mechanical ventilation or occurs after vigorous resuscitation, especially in premature neonates with respiratory disorders. It usually occurs with other air leak syndromes, such as pneumothorax, pneumomediastinum, pneumoperitoneum, subcutaneous or interstitial emphysema. The incidence rates vary from 1.3% (in the whole neonatal population) to 2% (in the very low birth weight newborns). We report a case of neonatal pneumopericardium and cardiac tamponade occurring in the presence of RDS.

CASE REPORT

A 1,500 g female neonate of 29 weeks gestation was born to a para 1 mother, via urgent caesarean section for massive abruption of the placenta. Apgar score was 7, 8, 8 at 1, 5 and 10 minutes, respectively. The neonate was intubated because of breathing difficulty and transferred to our NICU at the 5th hour of life. At admission, chest X-ray was performed and showed respiratory distress syndrome (RDS). Surfactant therapy was administered. Her clinical condition improved until the 16th hour of life, when it deteriorated severely, with bradycardia, hypoxia, muffled heart sounds, subcutaneous cervical emphysema and finally pallor and hypotension. With the clinical suspicion of pneumothorax, despite the peer air ventilation, a needle was placed in the right hemithorax and a significant volume of air was drained, but no improvement was noticed. The following chest X-ray confirmed our suspicion as it showed right pneumothorax and pneumopericardium. Cardiopulmonary resuscitation was continued and percutaneous pericardiocentesis was performed with a non-rendered needle. The newborn died due to cardiac tamponade.

CONCLUSION

Clinical suspicion and rapid intervention in cases of pneumopericardium is of major importance. Sudden onset of bradycardia, cyanosis and hypotension are the most commonly observed signs of tension pneumothorax, but when they are accompanied by muffled heart sounds, pneumopericardium is very likely. Differentiation from pneumothorax is often difficult as there is little time for radiological testing. The treatment consists of needle pericardiocentesis or continuous tube drainage (by specialists), as there is a significant chance of recurrence.

ABS 38

PROLONGED MECHANICAL VENTILATION IN NEONATES WITH CONGENITAL HEART DISEASE AFTER CARDIAC SURGERY

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INTRODUCTION

Prolonged postoperative mechanical ventilation (MV) is associated with adverse outcome in children undergoing cardiac surgery. The aim of this study was to evaluate the factors associated with prolonged mechanical ventilation in neonates undergoing cardiac surgery for Congenital Heart Disease (CHD).

METHODS

We retrospectively evaluated all neonates admitted to a tertiary Cardiac Intensive Care Unit during the last 12 months. Patients were categorized according to the duration of mechanical ventilation. Prolonged mechanical ventilation was defined as the need for MV for > 7 days postoperatively. We evaluated the differences of the two groups of patients according to their age at surgery, delayed sternal closure, extubation failure, the duration of inotropic support, hospital acquired infections and development of Acute Kidney Injury (AKI) and other non-infectious complications postoperatively.

RESULTS

During the study period, twenty-four neonates with CHD were admitted after cardiac surgery to our CICU. Factors related to prolonged mechanical ventilation were younger age at admission (median age 17.5 days vs 23 days, p 0.026), delayed sternal closure (median 12 vs 2 days, p 0.032) and longer duration of inotropic support (median 11 days vs 3.5, $p < 0.0001$). Furthermore, in neonates with prolonged MV, postoperative infections (83.3% vs 33.4%), AKI (58.3% vs 8.3%) and non-infectious complications (66.7% vs 16.7%) were significantly more frequent. In this group, we also observed differences in extubation failure (33.4% vs 8.3%), as well as greater use of HFNC/NIV in the post-extubation period (33.4% vs 16.7%) and prolonged CICU stay (median 12.5 days vs 6 days, $p < 0.05$).

CONCLUSIONS

Peri-operative factors associated with prolonged MV in neonates after cardiac surgery need to be constantly evaluated in order to improve the outcome of this special group of patients.

ABS 39

SCIMITAR SYNDROME – DIAGNOSTIC SUSPICION BASED ON A SIMPLE CHEST X-RAY

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INTRODUCTION

Scimitar syndrome is a rare congenital pulmonary anomaly, with a wide and variable spectrum of presentations. Its defining feature is the anomalous pulmonary venous drainage into the inferior vena cava via an alternative descending vein that runs parallel to the right border of the heart giving an appearance of a curved Turkish sword or scimitar on plain chest radiography. It is one of the several findings in congenital pulmonary venolobar syndrome in association with malformation of the right lung, abnormal arterial supply and sometimes cardiac malformations. It has a low incidence of 1-3 per 100,000 births. We present a case of a late preterm newborn with dyspnea at birth and a chest x-ray suggestive of pulmonary hypoplasia with scimitar syndrome.

CASE REPORT

M.S. was born by vaginal delivery at 36 gestational weeks, with a birth weight of 2,600 g. Apgar scores were 7 at 1 min, 9 at 5 min. No neonatal resuscitation was needed but soon after birth she developed nasal flaring and rib retractions, requiring supplemental oxygen to provide adequate oxygenation. Twenty-four hours after birth, nasal CPAP was required due to respiratory acidosis. A chest x-ray was performed and showed a hypoplastic right hemithorax and a tubular structure in the lower right lung, with the shape of a scimitar (**Fig. 1**). These findings are suggestive of Scimitar syndrome. Pediatric Cardiology collaboration was requested and computed tomography angiography (CTA) was performed, confirming a congenital pulmonary venolobar syndrome. In a multidisciplinary evaluation (Cardiothoracic Surgery, Neonatology, Pediatric

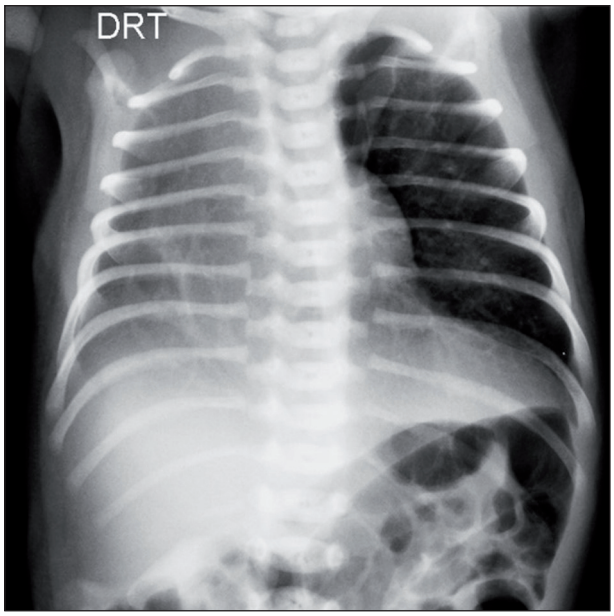

Figure 1 (ABS 39). Chest x-ray – hypoplastic right hemithorax and a tubular structure in the lower right lung, with the shape of a scimitar.

Cardiology and Pediatric Pneumology), it was decided to maintain conservative management, while awaiting weight gain for subsequent re-evaluation. On D31 she presented severe clinical worsening with fever, abdominal distension and gross blood in stools, requiring invasive ventilation and inotropic support, ultimately dying five hours later. Autopsy results confirmed the diagnosis of Scimitar syndrome.

CONCLUSIONS

Although uncommon, the diagnostic suspicion of this anomaly can be established with a simple chest x-ray (scimitar sign) but further studies, such us echocardiography, CTA, magnetic resonance imaging angiography (MRA), are needed to confirm the diagnosis and demonstrate other associated abnormalities. Treatment of symptomatic patients with increased shunting implies surgical correction. Mortality remains high even with surgical intervention, especially in those patients with additional cardiac malformations. Early recognition and treatment are the keys to survival.

ABS 40

THE INCIDENCE OF RESPIRATORY MORBIDITY IN LATE PRETERM INFANTS

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INTRODUCTION

Premature births show an increased incidence in late years, demonstrated by the growing number of late preterm (LPT) births. The incidence represents 74% of all preterm infants and 8-9% of all births, with high respiratory morbidity. Aims: The objective of the study was to highlight the role of gestational age in the incidence of increase in neonatal respiratory morbidity in LPT newborns (34-36 weeks) compared with term newborns (39-41 weeks).

MATERIAL AND METHOD

A retrospective study conducted over a period of 4 years (from 2014 to 2017) in a third level maternity compared respiratory morbidity in LPT infants with term newborns and the respiratory therapy used.

RESULTS

We analyzed a total of 11,949 births with mean gestational age between 34-41 weeks, who were divided into two study groups (LPT and term newborns). RDS incidence was 34.2% at 34 weeks and 0.7% in term newborns. 53% of LPT compared to 31.2% of term infants were born by cesarean delivery. The incidence of transient tachypnoea was 7.9% in LPT compared with 0.5% in term newborns. The odds ratio for RDS decreased with the increase in GA up to 38 weeks compared with the 39-40 weeks group. OR at 34 weeks was 39.1 (95% confidence interval [CI], 31.0-47.3), at 38 weeks, 1.15 (95% CI, 0.9-1.4). At 37 weeks, RDS incidence increased compared with the 39-40 week group (Adjusted OR, 3.1; 95% CI, 2.5-3.7), but at 38 weeks it was similar to the 39-40 week group. Similarly, incidence of TTN was greatly increased at 34 weeks (14.7; 95% CI, 11.7-18.4) compared with the 38-week group (1.0; 95% CI, 0.8-1.2), neonatal pneumonia incidence was 5.4% (95% CI, 6.9-16.1) at 34 weeks and 0.4% (95% CI, 0.6-1.2) at 38 weeks. The need for ventilator support was 7.5% at 34 weeks 0.2% after 38 weeks.

CONCLUSION

Respiratory distress syndrome remains a common disease of the LPT infant. Its severity increases with the decrease in gestational age. Respiratory morbidity for this age includes: transient tachypnoea of the newborn, deficit /inactivation of surfactant and pulmonary hypertension. Caesarean section without labor increases the risk for this disease with decrease in gestational age and the need for ventilatory support is higher in LPT infants.

ABS 41

AN UNCOMMON ETIOLOGY OF RESPIRATORY DISTRESS IN A NEWBORN

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INTRODUCTION

Congenital syphilis is a preventable and a treatable disease but still a serious worldwide public health problem in the 21st century. It occurs due to the transmission of *Treponema pallidum* from an infected mother to the baby through the placenta. Since it is a multisystem infection, its clinical manifestations may vary according to the affected organs and the severity of the infection. We report a newborn with congenital syphilis who presented with syphilitic pneumonia and generalized bullous eruptions and desquamation.

CASE PRESENTATION

A female neonate at 37 weeks of gestation was born by vaginal delivery to a mother who had received regular prenatal care. The mother denied any history of infection, drug use or exposure to chemical agents. Apgar scores were 8 and 9 at 1 and 5 minutes. Her birth weight was 2,980 g, length was 49 cm and head circumference 33 cm. The baby was transferred to the neonatal intensive

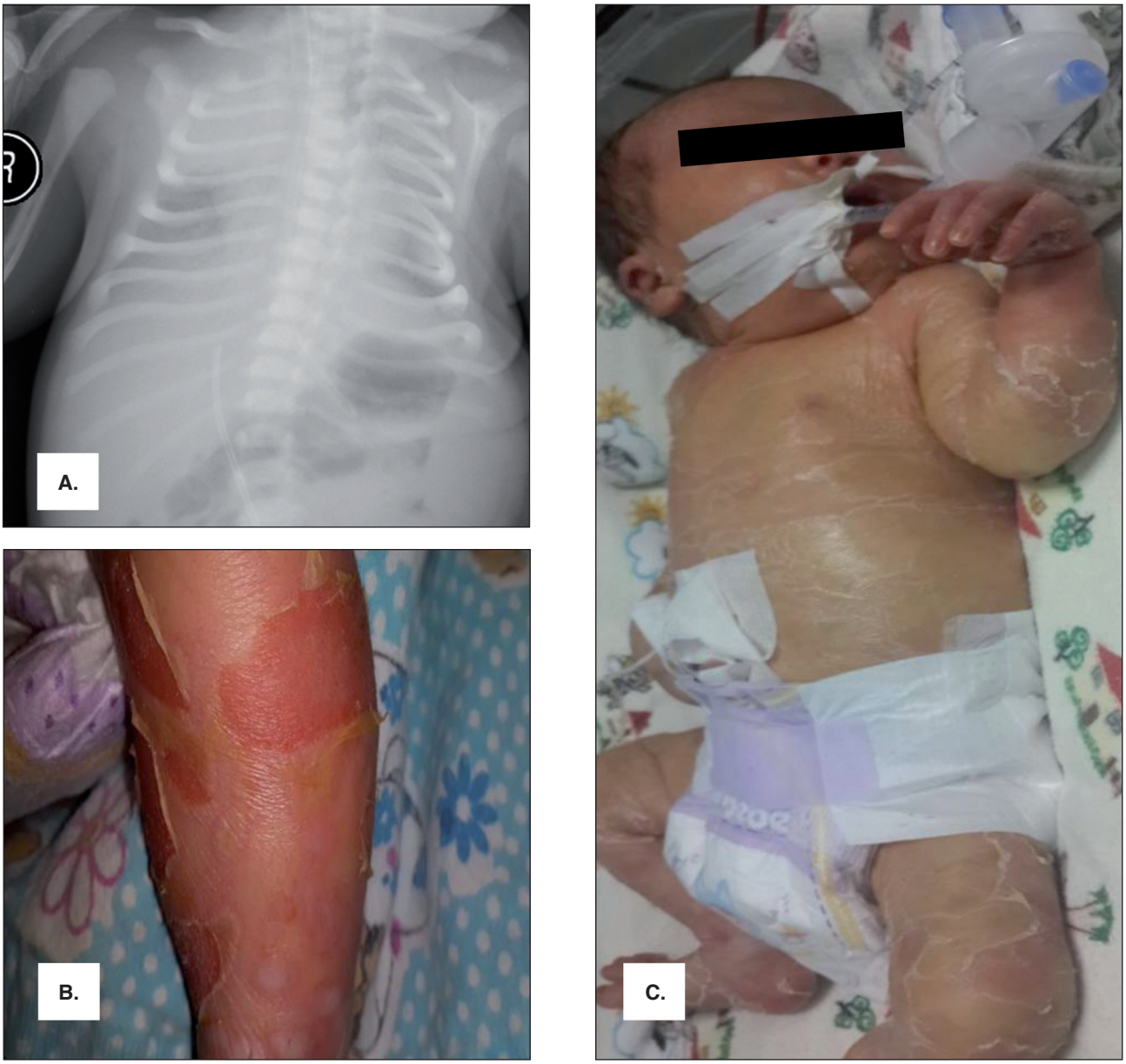

Figure 1 (ABS 41). A. X-ray film showing bilateral diffuse infiltration. **B.** Targetoid and bullous macules, desquamation. **C.** Generalized bullous eruptions and desquamation of the skin.

care unit due to respiratory distress, distended abdomen, hepatomegaly, generalized targetoid, bullous skin eruptions and desquamation. Her chest X-ray showed diffuse bilateral infiltration (**Fig. 1**). She was intubated and placed on mechanical ventilation, and an umbilical venous catheter was inserted. Laboratory studies demonstrated leukocytosis (23,700/microl), elevated CRP (105 mg/dl), alanine aminotransferase (307 IU/L), total (6.4 mg/dl) and direct bilirubin (4.1 mg/dl). Empiric antibiotics were initiated. The newborn had hypoxia and respiratory acidosis and received two doses of surfactant because of secondary surfactant deficiency. She was transfused with fresh frozen plasma and received vitamin K for coagulopathy. Serological studies for TORCH infections showed negative results. Syphilis serologic studies revealed a reactive Venereal Disease Research Laboratory (VDRL) titer of 1:32. Cerebrospinal fluid examination was normal. The mother's and the father's VDRL and Treponema Pallidum Hemagglutination Assay were positive. Her antibiotic was immediately changed to intravenous aqueous penicillin G. The infant was weaned to nasal CPAP by day 5 and on nasal oxygen cannula by day 8. The skin lesions subsided substantially during the treatment period. Her long bone radiographs, ophthalmologic examination and cranial ultrasonography were normal. Her follow-up at the age of 8 months revealed normal growth and development and positive VDRL at a titer of 1:1.

CONCLUSIONS

Early congenital syphilis may present with significant variation of clinical findings. Syphilitic pneumonia is a rare but a serious cause of neonatal respiratory distress in newborns. Our case had generalized bullous and pustular eruption, which is also a rare muco-cutaneous manifestation of the disease. Awareness of these unusual presentations of early congenital syphilis by the clinicians is necessary to make the right diagnosis and prevent mortality and serious sequelae.

ABS 42

MECONIUM ASPIRATION SYNDROME – A SIGNIFICANT PROBLEM IN THE NICU

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BACKGROUND

The aim of this study was to evaluate and describe the course of perinatal and postnatal factors in neonates with meconium aspiration syndrome (MAS) and to determine risk factors for a severe course of the disease.

METHODS

The study included 41 infants divided into two groups: a preterm group of gestational age < 37 weeks, and a group of term infants with gestational age > 37 weeks. The correlation between gestational age and need for conventional mechanical ventilation, duration of NICU stay and duration of antibiotic therapy was monitored.

RESULTS

This study included 41/185 infants admitted to our tertiary care department from 2014 to 2017 with clinical symptoms of respiratory distress and hypoxia. In the first group of infants with gestational age < 37 weeks we confirmed statistically significant correlation between gestational age and need for conventional mechanical ventilation (8.4 days, $p < 0.01$), duration of NICU stay (9.7 days, $p < 0.01$). In the second group of infants with gestational age > 37 weeks we confirmed correlation with conventional mechanical ventilation (9.9 days, $p < 0.01$) and duration of NICU stay (11 days, $p < 0.01$). Use of antibiotics for MAS did not result in significant reduction in the risk of mortality, sepsis or duration of hospital stay in both groups (10.3 days, $p = 0.1$; 10.7 days, $p = 0.1$).

CONCLUSION

Meconium aspiration syndrome (MAS) is a common cause of respiratory failure in neonates. Despite improvement in obstetrical and neonatal care, MAS continues to be a neonatal disorder with high morbidity and mortality.

ABS 43

NEONATAL RESPIRATORY INFECTION BY UREAPLASMA UREALYTICUM

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INTRODUCTION

Neonatal respiratory infection by *Ureaplasma urealyticum* is a rare condition which may be severe and life-threatening. It is often associated with

persistent pulmonary hypertension and may lead to chronic lung disease in preterms.

METHODS

We report the case of a newborn that developed a respiratory infection by *Ureaplasma urealyticum*.

RESULT

A full-term male newborn was born by C-section. The APGAR score was 9 at 1 min and 10 at 5 min. He developed immediate respiratory distress. Initial chest x-ray was normal. C-reactive protein was at 44 mg/ml. Initial management was based on oxygen therapy associated with cefotaxim by intravenous administration. However, clinical aggravation was noted, and bacteriological assessment was negative. Control chest x-ray showed alveolar-interstitial syndrome. Echocardiography was normal. An infection due to atypical bacteria was then suspected and cefotaxim was replaced by intravenous macrolid for 10 days. The mother's cervico-vaginal swab was positive for *Ureaplasma urealyticum* but the bacteria could not be isolated in the newborn. The outcome was favorable, and he recovered three days after macrolid administration.

CONCLUSION

Incidence of neonatal infection by *Ureaplasma urealyticum* is probably underestimated. Its clinical diagnosis is difficult as there is no specific clinical feature. Bacteriological diagnosis can also be difficult. For that reason, the bacteriological sample should be repeated if negative. Diagnosis must be kept in mind in the event of clinical aggravation despite antibiotic administration and negative bacteriological standard detection.

ABS 44

NON-INVASIVE TREATMENT IN SPONTANEOUS PNEUMOTHORAX OF THE NEWBORN

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INTRODUCTION

Spontaneous pneumothorax is very rarely diagnosed in newborns but it can have fatal consequences. We are trying to establish whether personalized treatment based on non-invasive mechanical ventilation in these cases decreases the incidence of treatment-related morbidity and whether it has a positive impact on the newborn's outcome.

MATERIALS AND METHODS

An analytical study was performed in the Polizu Maternity on a group of term newborns diagnosed with spontaneous pneumothorax. Follow-up data about the pregnancy (mode of conception, associated maternal pathology), delivery (type of delivery, Apgar score, need for resuscitation at birth) and the newborn (sex, birth weight, transition to extra-uterine life), need for treatment and response to non-invasive treatment were monitored.

RESULTS

Newborns diagnosed with spontaneous pneumothorax were born from naturally obtained pregnancies with birth weight within the norm for gestational age, 85.7% males and 14.2% females. Maternal pathology was infectious in 48.8% of cases, 57.34% of whom were extracted by caesarean section, and 48.85% were born with spontaneous vaginal delivery. 71.4% were diagnosed with respiratory distress syndrome, 14.2% with congenital pneumonia and 14.2% with fetal distress. In all cases, spontaneous pneumothorax was of the secondary type, resulting after difficult respiratory transition to extra-uterine life or an affected lung (meconial amniotic fluid, congenital pneumonia). The treatment of pneumothorax consisted in positioning in 100% of cases drainage and mechanical ventilation in 71.5% of cases. Conventional ventilation was used in 42.85% of cases, nasal high frequency oscillatory ventilation (HFOV) was used in 14.2% of cases. The days of hospitalization of these newborns were on average 8-10, fewer in the cases with nasal HFOV.

CONCLUSIONS

The outcome of newborns diagnosed with spontaneous pneumothorax is directly related to the degree of perinatal damage during the transition to extra-uterine life; the use of nasal HFOV ventilation limits complications of an otherwise invasive therapy.

ABS 45

PNEUMOTHORAX IN A NEONATAL INTENSIVE CARE UNIT IN TUNISIA

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INTRODUCTION
Neonatal pneumothorax (PTX) can occur due to underlying pulmonary disease and/or ventilatory support. Prompt diagnosis and management are essential to reduce morbidity and mortality. The aim of this study was to analyse demographic aspects, required treatment (needle aspiration or chest drain) and prognosis of neonatal PTX in an Intensive Care Unit in Tunisia.
MATERIALS AND METHODS
This is a retrospective, descriptive and analytic population-based cohort study. Inclusion criteria were neonates with symptomatic PTX, born between 1 January 2010 and 31 December 2014 and treated in the Intensive Care Unit of Monastir (Tunisia). Postoperative PTX was excluded. Needle aspiration with or without mechanical ventilation was the first-line treatment. In case of failure, a chest drain was used.
RESULTS
During the study period there were 32,156 live births and 67 cases of PTX, giving an incidence of PTX of 0.2%. Of these cases, 19% were bilateral and 78% tension PTX. Forty-nine percent of neonates affected were preterm. Fifty-eight percent of the neonates were delivered by caesarean section, 28% of which were elective. Almost all neonates had underlying lung disease, most commonly respiratory distress syndrome (RDS) in 42% and maternofetal infection in 36%. Successful first-line treatment observed in 52% was significantly correlated with gestational age ≥ 37-week gestation ($p = 0.002$), Silverman score ≤ 4 ($p = 0.004$), oxygen saturation ≥ 90% ($p = 0.002$) and air volume exsufflation ≤ 100 milliliters. Thirty-seven percent of neonates required drainage of the PTX. Sixteen percent of PTX infants died, almost all because of other co-morbidities.
CONCLUSION
Neonatal PTX can be life-threatening. Less invasive treatment should be applied first in certain situations to reduce morbidity and mortality related to aggressive treatments.

ABS 46

RESPIRATORY DISTRESS IN LATE PRETERM AND FULL-TERM NEWBORNS

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INTRODUCTION
Neonatal respiratory distress is a common disorder in preterm babies, but it may also occur in late preterm and full-term newborns. There are several etiologies and different clinical aspects and evolutions. The aim of this study was to determine the particularities of the epidemiology, clinical features and outcomes of respiratory distress in late preterm and full-term newborns.
METHODS
This was a retrospective study of 458 infants born after 35 weeks of gestation who were admitted to the neonatal intensive care unit of Sfax because of respiratory distress from January 2013 to December 2014.
RESULTS
Neonatal respiratory distress in late preterm and full-term newborns accounted for 14.8% of hospitalizations during the study period. It was more frequent in male infants (62.4%). The most common cause was transient tachypnea of the newborn (82.5%) followed by persistent pulmonary hypertension of the newborn (6.8%), meconium aspiration syndrome (5.2%), respiratory distress syndrome (2.8%), neonatal infection (0.9%) and pneumothorax (0.7%). Delivery was by C-section in 64.6% of cases. The C-section was out of labor in 37.8% of cases. Respiratory management consisted in oxygen administration via hood in 79.6% of cases, nasal continuous positive airway pressure in 5.4% of cases and invasive ventilation in 15% of cases. High frequency oscillation ventilation was needed in 6.1% of cases. The average duration of oxygen therapy was 56 hours. The most common complication was nosocomial infections (9.6%), followed by persistent pulmonary hypertension of the newborn (4.8%) and pneumothorax (4.1%). The mortality rate was 2.2% (10 newborns).
CONCLUSION
Neonatal respiratory distress is common in late preterm and full-term newborns. It is often benign; however, it can be severe and life-threatening. Better perinatal management will certainly improve prognosis.

ABS 47

CARDIAC FIBROELASTOSIS IN A PRETERM INFANT WITH INTRAUTERINE GROWTH RESTRICTION

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CASE REPORT

We present the case of a female preterm baby with intrauterine growth restriction born at 28 weeks by cesarean section from transversal presentation, birth weight of 720 grams, Apgar Score 2/4/6/7, from a high-risk pregnancy (mother with urinary tract infection). The newborn was admitted to the NICU department where she was initially intubated oro-tracheally and mechanically ventilated for 3 days, with slow but good respiratory development. During hospitalization, she showed slow and favorable progression – specific for a preterm newborn with intrauterine growth restriction and extremely low gestational age. At 40 days of life there was a sudden change in general condition, with cyanotic skin, intensely marbled, cold extremities, capillary recoloration time about 4-5 seconds, superficial breathing, SPO_2 80%, heart rate of 80-100 bpm, rhythmic cord, low tonus and reactivity. Approximately 18 hours before the newborn's general condition started to deteriorate, she had received erythrocyte concentrate. This led to the suspicion of viral myocarditis, and prompted the following additional clinical and paraclinical investigations: transfusion incompatibility was excluded; CMV Ig M (negative); Adenovirus (negative); Coxachie B (negative); CK-MB (positive 61.29); thoracic and abdominal X- Ray (the suspicion of pneumopericardium was excluded). Cardiac echocardiography revealed bilateral ventricular hypertrophy with cardiac cavity dilation, reduced kinetics, low ejection fraction and low cardiac flow rate. Despite extensive resuscitation with oro-tracheal intubation and mechanical ventilation, inotrope cardiac support, administration of plasma and thrombocytes the newborn died.

DISCUSSION

We raised the suspicion of endocardial fibroelastosis, which was confirmed by the anatomic pathology findings of thickening of the myocardium, globular cord, pearl like, porcelain aspect. The particularity of the case is the initially good development of the newborn and the slow but severe cardiac decompensation, which did not respond to resuscitation maneuvers.

ABS 48

MANAGEMENT AND PROGNOSIS OF HYALINE MEMBRANE DISEASE

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INTRODUCTION

Hyaline membrane disease (HMD) is a severe respiratory disorder of the newborn. It is a serious public health issue firstly because of its poor prognosis, but also due to the difficulties posed by patient care and hospitalization costs. The objective of this study was to analyse the epidemiological factors of hyaline membrane disease and its therapeutic management, and to assess its prognosis.

PATIENTS AND METHODS

This is a retrospective study including 279 infants with HMD who were admitted to the neonatology department of Hédi Chaker University Hospital of Sfax (Tunisia) between January 2014 and December 2016.

RESULTS

96.8% infants were premature and 81.7% were born before 33 weeks. Caesarean section was performed in 82.1% of cases. 228 newborns (81.7%) had received pulmonary surfactant. Continuous Positive Airway Pressure (CPAP) was required in 201 cases (72%). 153 infants (54.8%) needed mechanical ventilation and 47 cases (30.7%) were assisted by High Frequency Oscillation Ventilation (HFOV). The INSURE method was used for 104 newborns (45.6%). We observed 10 cases of pneumothorax (3.6%). Bronchopulmonary dysplasia affected 8 infants (2.9%). Nosocomial infection was recorded in 20 cases (7.2%). Necrotizing enterocolitis affected 11 newborns (3.9%). 9.7% had intracranial hemorrhage and 1.8% had periventricular leukomalacia. The mortality rate was 36.2%.

CONCLUSIONS

We have noted a considerable decrease in the mortality rate of preterm newborns with HMD in our department (92.8% in the 1980s). However, its incidence remains high, due in part to induced preterm birth. In addition, HMD may lead to serious neurological sequelae. To improve the prognosis of these infants, management should be immediate and appropriate. In our current conditions, the therapeutic management of an extreme premature infant is cumbersome, onerous and difficult.

ABS 49

PLEURAL EFFUSION IN A LEVEL III NEONATAL INTENSIVE CARE UNIT (A STUDY OF 6 CASES)

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INTRODUCTION
Neonatal pleurisy is a rare clinical manifestation. It can be isolated or be part of an anasarca. The underlying cause may be difficult to identify within the first days of life, which may lead to management difficulties. Through this study, we aim to identify the clinical features, etiology, management and outcome of pleural effusion in the newborn.
METHODS
This was a retrospective study of all newborns with the diagnosis of pleural effusion registered in the neonatal intensive care unit of Sfax from 2010 to 2017. Anasarcas were excluded.
RESULTS
Six newborns were included, 5 males and 1 female. Pleural effusion was acquired in only one newborn, and was congenital in five newborns. All of them had an antenatal diagnosis and they developed respiratory distress at birth. Thoracentesis was performed in 5 cases and chylothorax was diagnosed in 4 cases. In the other cases, pleural effusion was secondary to pulmonary sequestration in one case and to leakage of parenteral nutrition in one case. Therapeutic management was based on mechanical ventilation and thoracic drainage in 3 infants, associated with total parenteral nutrition with infant formula containing medium-chain triglycerides. Octreotid administration was needed in 1 case of refractory chylothorax. For the other cases, clinical supervision was chosen. Outcome was favorable in 5 cases, while one patient died due to severe sepsis.
CONCLUSIONS
Pleural effusion in the newborn may reveal pulmonary malformation, but its main cause is chylothorax. Management and outcome depend both on underlying etiology and on clinical tolerance of the pleural effusion.

ABS 50

RESPIRATORY DISTRESS SYNDROME IN FULL-TERM NEWBORNS (A STUDY OF 12 CASES)

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INTRODUCTION
Hyaline membranes disease or respiratory distress syndrome is mainly seen in preterm infants. It is often underestimated and unexpected in full-term newborns as the risk of developing this respiratory disorder decreases with increasing gestational age. We aim to identify the specificities of epidemiology, clinical features, management and outcome of respiratory distress syndrome in full-term neonates.
METHODS
This was a retrospective study including all newborns delivered after 37 weeks of gestation and admitted for respiratory distress syndrome to the neonatal intensive care unit of Sfax from 2014 to 2017.
RESULTS
Twelve newborns were included, 8 male and 4 female. Average gestational age was 37 GW and 2 days (from 37 to 40 GW). Average birth weight was 2,950 g (from 2,250 g to 3,800 g). Growth restriction was found in 5 newborns. Delivery was by C-section in 9 cases. It was out of labor in 3 cases. Tracheal intubation with respiratory assistance was needed in 11 newborns. The mean duration of assisted ventilation was 93 hours (from 24 to 188 hours). Eleven neonates received exogenous surfactant. It was administered according to the INSURE method in three cases. The average age at surfactant administration was 9 hours. No complication was noted, and the outcome was favorable in all cases, with an average duration of hospitalization of 11 days (from 6 to 19 days).
CONCLUSION
It is nowadays accepted that respiratory distress syndrome does exist in full term newborns. While it is rare, it can be severe and life-threatening. Early diagnosis is essential for better management and outcome.

ABS 51

BRONCHOPULMONARY DYSPLASIA IN PREMATURE NEONATES

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INTRODUCTION
Bronchopulmonary dysplasia (BPD) is a multi-etiology chronic pulmonary disorder that occurs

in premature infants with morpho-functional immaturity of the lungs undergoing oxygen therapy. The condition, which is manifested by pulmonary affection with the development of emphysema, fibrosis, bronchial obstruction and various radiological changes in the first months.

PURPOSE OF THE PAPER

The aim of the research was to evaluate preterm infants born with bronchopulmonary dysplasia (BPD) based on gender, birth weight and gestation.

MATERIALS AND METHODS

All 51 children were part of a cohort study, which continues. The children, hospitalized in the Pneumology Clinic, had a positive history of premature birth and oxygen treatment for respiratory distress syndrome. 15 preterm infants who did not have BPD made up the control group (29.4%: 95% CI 17.5-43.8) while 36 children (70.6%: 95% CI 56.2-82.5) – the basic lot. The materials were analyzed with Microsoft Excel, Epi Info™ – 3.5.

RESULTS

In the base group there are more boys (56.6%: 95% CI, 38.1-72.1 cases [20 boys] and 44.4%: 95% CI, 27.9-61.9 cases [16 girls]). In the control group there are more girls (53.3%: 95% CI, 26.6-78.7 cases [8 girls] and 46.7%: 95% CI, 21.3-73.4 cases [7 boys]). Mean age at birth was 27.8 ± 0.58 weeks (mean value corresponding to the maximum frequency of a 30-week [Mo] series, maximum 34 weeks and minimum 23 weeks) in the baseline group (BPD) and 29.38 ± 1.10 weeks (Mo – 34 weeks, maximum 34 weeks and minimum 24 weeks) in children in the control group, $F = 1.93$, $p > 0.05$. Mean weight at birth – 1,245 ± 85.8 g (Mo – 1,800 g, maximum value 2,300 g, minimum value 600 g) in the basic lot and equal to 1,435 ± 163.9 g (Mo – 1,300 g, maximum value 2,600 g and minimum value 700 g) in the children in the control group, $F = 1.41$, $p > 0.05$.

CONCLUSIONS

Depending on gender, birth weight and gestation, no significant differences between batches were noted.

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ABS 52

CYSTIC FIBROSIS IN PREMATURE NEWBORNS

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INTRODUCTION

In documented cases of children with CF and premature birth, babies born at a gestational age of less than 32 weeks have died in the first few months of life due to respiratory insufficiency. A diagnosis of extreme prematurity associated with CF frequently leads to death.

AIMS

To evaluate the onset of cystic fibrosis in a premature baby, to prevent exacerbation with irreversible complications.

MATERIALS AND METHODS

We present a clinical case of a premature newborn with cystic fibrosis. The diagnosis of CF was confirmed by identifying clinical signs of lung involvement with severe respiratory infections associated with maldigestion syndrome (diarrhea with fatty stool, stunted growth and underweight) and positive sweat test.

RESULTS

Child S.S., 5 months old, born at 28 weeks of gestation. The first suspicions arose at the first visit to a family doctor at one month, which showed delayed physical development, weight of 2,900 g (p0-3), height of 47 cm (p0-3). At the same time, the child presented with an intense wet cough during the day with repeated access, mainly without expectorants, or in very small amounts, of whitish color. The child also had dyspeptic disorders (frequent greasy stools without weight gain). The child was born premature at 28-29 weeks. First pregnancy, first birth. Neuropsychological development with lack of fixation of the eyes, the baby does not keep his head up, does not smile. The baby is artificially fed with Similac® milk powder formula. Vaccines are contra-indicated by the neurologist due to prematurity. Total protein 6.0 g/l; urea within the norm (4.5 mmol/l); creatinine 44 mcmol/l; total bilirubin within the limits; ALAT and ASAT both within the norm; K – increased 6.07 mmol/l, Na – 136 mmol/l and Ca – 2.14 mmol/l. The positive sweat test was 81.22 mmol/l. Elastase in stool 200 μg/g. Repeated thoracic radiographs: radiological condensation syndrome.

CONCLUSIONS

Cystic fibrosis in the premature infant is a severe pathology with a poor prognosis.

ABS 53

RESPIRATORY AFFECTATION IN PREMATURE NEWBORNS

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INTRODUCTION

Preterm birth occurs under the influence of various factors during intrauterine life. These premature newborns have an increased risk of morbidity and mortality compared to those born at full term. These changes are taken into account together with the risks of various types of infections associated with prematurity.

CASE REPORT

We present a clinical case of a premature baby. Diagnosis was confirmed clinically, paraclinically and instrumentally by identifying lung damage. Female child born on 17.08.2017, at the 29th week of gestation (s.g.). The child is from the 5th pregnancy (first and second pregnancy healthy children, then at the third and fourth pregnancies medical abortion). The current pregnancy progressed pathologically with severely progressive toxicosis from 6 weeks, with static treatment for the maintenance of pregnancy, retroplacental hematoma, risk of spontaneous abortion, placenta previa, weight loss. The mother presented repeated urinary tract infections. The child was born with very low birth weight – 1,400 g, 30 cm width and 29 cm cranial perimeter. Apgar score was 5/6 points. Two doses of intratracheal surfactant were administered. The baby was placed in CPAP, then pulmonary artificial ventilators (PAV) with hyperventilation regimen for 2 weeks. According to medical indications, conditioned by severe bronchopulmonary involvement with respiratory distress syndrome and neonatal sepsis, CPAP was maintained for 2 weeks. Muscle hypotonus, low motor activity, FR – 55/min, SpO_2 – 68-70% (at CPAP – 89-91%). Auscultation: attenuated murmur, crawling rallies, stridor. CF – 142, AP – 90/49 mmHg. General blood testing: L – 28 x 10^9/L. Antenatal ultrasound in the second-third trimester of pregnancy with Doppler 09.08.17 – Hyperechogenic lung with multiple cystic formations on the right d – 4.1 mm, d – 5.1 mm; on the left d – 9.6 mm, d – 4.9 mm suggestive of pulmonary adenomatosis. Thymus hypoplasia – suggestive of Di George syndrome. CT of the thoracic box 4.10.17 (1 month and 13 days) – multiple fibro-atelectasic areas in S2-5 and in the S10 projection on the left of an undetermined configuration without visualization of the aerobic bronchogram associated with air bubbles measuring several millimeters (d max up to 5.0 mm). Multiple linear and cross-linkage opacities in double-diffused diffuse heterodyne areas. Distortion of the anatomical architecture of the pulmonary parenchyma, marked by mosaic attenuation (areas in hypo- and hypertonia) in both fields. Bilateral diffuse pulmonary emphysema (air trapping). Hyper-pneumatizing bilateral S3. Single pleuro-pulmonary adhesions disseminated in bilateral basal segments (subliminal linear opacities). Thymus configuration appropriate for age and size.

CONCLUSION

The child presents the impact of harmful factors that affect premature birth with multiple respiratory morbidities (congenital and acquired).

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