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ID 50. The effects of mean platelet volume, nucleated red blood cells and right ventricular systolic pressure on prediction of severity of transient tachypnea of the newborn

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Background: Transient tachypnea of the newborn (TTN) is a common clinical problem that often occurs in the first hours after birth. Although it is considered to be a benign clinical course, some cases may have severe symptoms and require ventilation support. In this study, we aimed to determine the association between the mean platelet volume (MPV), nucleated red blood cell (nRBC), right ventricular systolic pressure (RVSP) and the severity of TTN.

Methods: Patients with TTN were divided into two groups according to Silverman score (<7: group 1[n:34] and ≥7: Group 2 [n:30]). The groups were compared in terms of demographic characteristics, hematologic parameters and RVSP within the first 24 h after admission.

Results: Mean birth weight of the patients were 3033.4±364.1 g and median gestational age were 38 weeks (min–max 34–42). The rate of C/S was found to be higher ($p = 0.015$) and APGAR scores at 1th and 5th minutes ($p = 0.001$, $p = 0.003$ respectively) were lower in Group 2. The comparison of respiratory findings were mentioned in Table 1. In terms of hematologic parameters; Group 2 had significantly higher thrombocyte, haemoglobin, hematocrit and nRBC levels ($p < 0.05$). RVSP were found to be higher in Group 2 (p: 0.001). In logistic regression analysis, nRBC was found to be the most important independent parameter affects Silverman score at admission (OR: 7.065, CI: 1258–39,670, p: 0.026).

Conclusion: This is the first study that investigates the effects of nRBC and RVSP on severity of TTN. It shows that patients with high nRBC and RVSP values may have poor prognosis, require longer ventilation support and longer duration of hospitalization.

	Group-1 (n = 34) Silverman score < 7	Group-2 (n = 30) Silverman score ≥ 7	p
Respiratory rate at admission[a]	64 (60–78)	68 (62–88)	**0.003**
Downe's score at admission[a]	4 (2–7)	7 (7–10)	**0.001**
Downe's score at 24th hour[a]	1 (0–3)	3 (1–10)	**0.001**
Silverman score at 24th hour[a]	1 (0–3)	3 (1–9)	**0.001**
Oxygen free saturation at admission[a]	93 (84–98)	90 (81–94)	**0.001**
Duration of hospitalization[a]	3 (1–8)	6 (2–15)	**0.001**
Respiratory support (n)			
Hood	25	3	**0.001**
nCPAP	9	17	
nSIMV	0	7	
SIMV	0	3	
Duration of oxygen treatment[a]	2 (1–5)	4 (1–14)	**0.001**

[a]Median (min−max).
(ID 50) - Table 1. The comparison of respiratory findings
None declared.

ID 54. A randomised trial of prophylactic oropharyngeal surfactant for preterm infants

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Background: Preterm infants are at high risk of developing respiratory distress syndrome (RDS). Endotracheal surfactant is effective in preventing and treating RDS; however, intubation is invasive and associated with adverse effects. Half of infants born <29 weeks' gestation initially managed with continuous positive airway pressure (CPAP) are ultimately intubated for surfactant. Administration of surfactant into the pharynx has been reported in preterm animals and humans and may be effective. We wished to determine whether giving oropharyngeal surfactant at birth reduces the rate of endotracheal intubation for respiratory failure in preterm infants within 120 hours.

Methods/design: Infants born before 29 weeks' gestation who were free of major anomalies were enrolled to this unblinded study at nine centres in six European countries. They were randomly assigned to receive oropharyngeal surfactant at birth in addition to CPAP or CPAP alone. The primary outcome was intubation within 120 h of birth, either for bradycardia and/or apnoea despite respiratory support in the delivery room, or for pre-specified respiratory failure criteria in the neonatal intensive care unit. Secondary outcomes included incidence of mechanical ventilation, chronic lung disease, and death before hospital discharge.

Results: A total of 251 infants were included in the study; 126 infants were assigned to oropharyngeal surfactant and 125 infants to control. The groups were well matched at study entry; their mean (SD) gestational age was 26 (2) vs 26 (2) weeks, and their mean (SD) birth weight was 874 (261) vs 851 (253) g respectively. There was no difference between groups in the rate of intubation at 120 hours [79/126 (63) vs 81/125 (65)%, $p = 0.793$] (table). There were no differences between the groups in the rate or duration of mechanical ventilation; the rates of bronchopulmonary dysplasia, chronic lung disease, or postnatal steroid use; or in the rate of death before hospital discharge.

Conclusion: Administration of surfactant into the oropharynx immediately after birth in addition to CPAP compared to CPAP alone did not reduce the rate of intubation amongst infants born before 29 weeks' gestation in the first 5 days of life.

	OP Surfactant N = 126	Control N = 125	P value
Primary intention-to-treat analysis			
Intubated within 120 h of life	79 (63)	81 (65)	0.793
GA < 26 weeks	40/48 (83)	35/44 (80)	0.789
GA 26–28^{+6} weeks	39/78 (50)	46/80 (57)	0.429
Other outcome measures			
Pneumothorax, n (%)	21 (17)	9 (7)	0.031
Pulmonary hemorrhage, n (%)	6 (5)	5 (4)	0.999
Mechanical ventilation, n (%)	77 (62)	81 (66)	0.511
Days of mechanical ventilation, median (IQR)	1 (0, 8)	2 (0, 7)	0.445
Postnatal corticosteroids, n (%)	27 (22)	29 (24)	0.762
Days of respiratory support, median (IQR)	53 (27, 73)	50 (26, 72)	0.798
BPD, n (%)	72 (70)	73 (69)	0.882
CLD, n (%)	26 (26)	29 (29)	0.637
Medical treatment for PDA, n (%)	26 (21)	37 (30)	0.110
Surgical treatment for PDA, n (%)	2 (8)	2 (5)	0.99
Necrotising enterocolitis, n (%)	10 (8)	13 (10)	0.259
IVH grade 3 or 4, n (%)	8 (6)	8 (7)	0.999
Cystic PVL, n (%)	4 (3)	4 (3)	0.999

	OP Surfactant N = 126	Control N = 125	P value
ROP treated with laser or intravitreal injections, n (%)	13 (10)	10 (8)	0.339
Death before hospital discharge, n (%)	23 (19)	22 (19)	0.999
Survival without BPD at hospital discharge, n (%)	31 (25)	32 (26)	0.884
Survival without CLD at hospital discharge, n (%)	71 (58)	72 (60)	0.794
Duration of hospitalisation, median (IQR), days	73 (53, 92)	75 (53, 88)	0.798
Home oxygen therapy, n (%)	3 (3)	10 (9)	0.048

BPD bronchopulmonary dysplasia, *CLD* chronic lung disease, *PDA* patent ductus arteriosus, *IVH* intraventricular haemorrhage, *PVL* periventricular leukomalacia, *ROP* retinopathy of prematurity.
(ID 54) - Table. Outcome measures.

Chiesi Farmaceutici, manufacturers of poractant alfa (Curosurf), supplied the study drug free of charge; they had no role in study design; and no role in data collection, analysis or interpretation.

ID 83. Short-term effects of systemic hydrocortisone initiated 7 to 14 days after birth in ventilated very preterm infants

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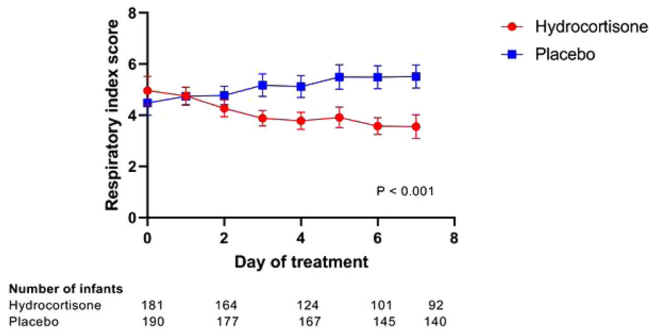
Background: The Systemic Hydrocortisone To Prevent Bronchopulmonary Dysplasia in preterm infants (the SToP-BPD) study is the first large randomized placebo-controlled trial investigating the effect of systemic hydrocortisone treatment initiated in the second week of life in ventilator-dependent preterm infants on the primary outcome death or bronchopulmonary dysplasia at 36 weeks' postmenstrual age. In the current study, we performed a secondary in-depth analysis of the short-term pulmonary and systemic effects of hydrocortisone treatment based on the data collected in the SToP-BPD study.

Methods: Eligible preterm infants with a gestational age <30 weeks and/or birth weight <1250 g were randomly assigned between 7–14 days of life to a 22–day course of systemic hydrocortisone (cumulative dose 72.5 mg/kg; n = 182) or placebo (n = 190). Data on extubation, ventilator mode and settings, blood glucose levels, and blood pressure were recorded daily during the 22-day treatment course. Changes over time during the first 7 days of treatment for the ventilator mode and settings, blood glucose levels, and blood pressure were compared between treatment groups with linear mixed effects models.

Results: At the end of the 22-day treatment course, a significantly lower proportion of infants in the hydrocortisone group failed extubation compared to the placebo group (23.2% [42/181] vs 34.9% [66/189], respectively; crude risk difference, −11.7% [95% CI, −20.7% to −2.4%]). Mean airway pressure, fraction of inspired oxygen and respiratory index decreased significantly over the first 7 days of treatment in infants treated with hydrocortisone compared to placebo (−0.42 cmH_2O [95% CI, −0.48 to −0.35], −0.02 [95% CI, −0.02 to −0.01], and −0.37 [95%, CI −0.44 to −0.30], respectively; all p < 0.001). Blood glucose levels and mean blood pressure increased significantly over the first 7 days in hydrocortisone treated infants (0.14 mmol/L [95% CI, 0.08 to 0.21] and 0.84 mmHg [95% CI, 0.58 to 1.09], respectively; both p < 0.001).

Conclusion: Systemic hydrocortisone initiated between 7–14 days after birth in mechanically ventilated preterm infants born before 30 weeks' gestation significantly improves the pulmonary condition, thereby facilitating weaning and extubation from invasive mechanical ventilation.



(ID 83) - Fig. 1. Changes over first 7 days of treatment in mean values for Respiratory Index (defined as MAWP × FiO2), with 95% confidence intervals analyzed with linear mixed effects models.

None declared.

ID 85. Congenital diaphragmatic hernia outcomes in a population with a high incidence of associated anomalies

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Background: Congenital diaphragmatic hernia (CDH) is a complex congenital condition with significant morbidity and mortality. The morbidity and mortality are increased when CDH is associated with other anomalies. Reported survival varies between centers but is mostly around 70%. The rates of termination of pregnancy (TOP), however, are high in many of these centers, especially for pregnancies with CDH and other anomalies. In this study, we report the outcomes of a population of CDH infants with a high incidence of associated anomalies but a low rate of TOP, and we compare these outcomes to published literature.

Methods: The data from CDH-Qatar (CDH-Q) registry (established as a part of CDH-Q program at Sidra Medicine), between April 2018 and December 2020, was compared to the published data by the CDH study group (CDHSG), the European Surveillance of congenital anomalies (EUROCAT), Florida Birth Defects Registry, and other centers.

Results: During the study period, 35 infants with CDH were treated at Sidra Medicine, with a median birth gestational age of 38 weeks (IQR 36–39) and birth weight of 2.78 kg (IQR 2.22–3.17). 27 infants (77%) were inborn, and 30 infants (86%) were diagnosed prenatally. None of the prenatally diagnosed cases resulted in TOP. A unique aspect of CDH-Q is the high rates of infants with associated congenital heart disease (23%), genetic abnormalities (26%), and major congenital anomalies (46%), as these rates are higher than what was reported in literature. Despite that, CDH-Q survival rates are similar to those reported in literature: Overall survival to home discharge is 69%, with higher survival among infants who were actively resuscitated at birth (73%), infants who underwent surgical repair (80%), and infants with isolated CDH (79%).

Conclusion: To our knowledge, CDH-Q is the first and only dedicated program for treatment of CDH in the Middle East. Considering the unique patient population with low incidence of TOP and higher incidence of genetic and congenital anomalies, the outcomes of CDH-Q are similar to published literature. Establishing a CDH registry for the Middle East would be beneficial to study and compare the characteristics and outcomes of CDH in this unique patient population.

None declared.

ID 185. Air distribution during non-invasive high-frequency ventilation in preterm infants

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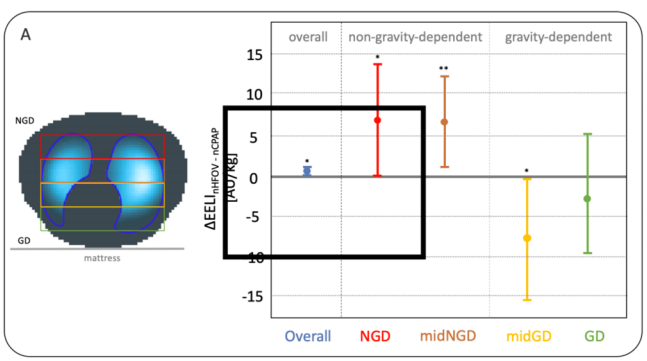
Introduction: The use of non-invasive high-frequency oscillatory ventilation (nHFOV) in preterm infants may be beneficial in selected clinical situations. However, the underlying pathophysiological mechanisms are still unexplained.

Objectives: To compare distribution of ventilation and aeration between nHFOV and nasal continuous positive airway pressure (nCPAP).

Methods: During a recent randomized crossover trial comparing nHFOV with nCPAP, electrical impedance tomography (EIT) data were recorded from 30 preterm infants in prone position. Thirty consecutive breaths were extracted for four recordings per mode of ventilation. During nHFOV, mean airway pressure equaled nCPAP pressure and the smallest amplitude to achieve visible chest wall vibration was used. Ventilation distribution of spontaneous breaths was assessed in 32 horizontal slices. Differences in end-expiratory lung impedance (EELI) between nHFOV and nCPAP were calculated for the whole lung and for four horizontal regions of interest.

Main results: Overall, 228 recordings were analyzed. Ventilation distribution of spontaneous breaths was similar between nHFOV and nCPAP. Considering the entire EIT signal including oscillatory volumes, aeration of the lung was increased during nHFOV compared to nCPAP [Mean difference (95% CI) = 0.4 (0.2–0.6) AU/kg, p = 0.013]. This effect was mainly due to an increase in EELI in the non-gravity-dependent regions of the lung [ΔEELINGD = 6.9 (0.0–13.8) AU/kg, p = 0.028; ΔEELImidNGD = 6.8 (1.2–12.4) AU/kg, p = 0.009], see Fig. 1.

Conclusion: Distribution of spontaneous breathing is similar during nHFOV and nCPAP but overall aeration is higher during nHFOV, particularly in the non-gravity-dependent regions of the lung. This may indicate that spontaneous breathing is not affected by nHFOV but that the superimposed oscillations contribute to potential clinical benefits.



(ID 185) - Changes in aeration between nHFOV and nCPAP. Mean and 95% CI of ΔEELI over the whole lung and for four quantiles of the lung (non-gravity-dependent to gravity dependent) are shown separately.

None declared.