neurological sequelae. Over-ventilation in infants with HIE can lead to hypocarbia and consequent cerebral vasoconstriction further increasing the risk of brain injury. Our aim was to assess the incidence of hypocarbia in HIE and identify infants at increased risk of hypocarbia.

Methods Retrospective review of term admissions with HIE to a tertiary neonatal intensive care unit from 2008 to 2013. Hypocarbia was defined as a partial blood pressure of CO_2 (pCO_2) ≤ 4 kPa.

Results 74 infants were reviewed. The median (interquartile range) gestational age was 40 (38–41) weeks. 47 (64%) were actively cooled. Arterial cord pH was 6.99 (6.80–7.10). 40 (54%) infants had hypocarbia on day 1: pCO_2 was 3.35 (2.84–3.73) kPa and duration of hypocarbia was 160 (120–300) minutes. 48 (64.9%) were ventilated: 11 (22.9%) with volute targeted-ventilation, 36 (75.0%) with non-volume-targeted ventilation and 1 (1.4%) with high-frequency oscillation. Lowest CO_2 was not significantly different but duration of hypocarbia was significantly longer ($p < 0.05$) in infants on non-volume-targeted ventilation [200 (180–390) minutes] compared to infants on volume-targeted ventilation [120 (90–225) minutes]. On day 1, a pCO_2 <4 kPa was recorded in 36 of 48 infants that were mechanically ventilated (75%), compared to 4 of 26 that were spontaneously breathing (15.4%) [Odds ratio: 16.5, Confidence Interval: 4.73–57.76].

Conclusions Hypocarbia is frequently encountered in HIE. Mechanical ventilation of infants with HIE should aim to avoid hypocarbia by applying "neuroprotective" ventilation strategies such as volume-targeted ventilation.

PO-0733 MINIMAL INVASIVE SURFACTANT THERAPY: CUI BONO?

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Background Minimal invasive surfactant therapy (MIST) is associated with a diminished need for mechanical ventilation. Insufficient insight exists in predictive success factors.

Aim Defining success factors for MIST.

Methods From 2011–2013 preterm infants admitted to the NICU with respiratory distress and radiographically established IRDS with FiO2 <0,4 were included for MIST procedure with surfactant (Survantaâ, 100 mg/kg) during nCPAP/nIPPV support. Therapeutic success was defined as decreased need for oxygenation without endotracheal ventilation support for 24 h. Patient characteristics were noted; including stress, defined as clinical discomfort and/or tachycardia, as well as procedure related desaturation (minimum 80%, < 30 seconds) bradycardia and complications (tracheal injury, pneumothorax or lung haemorrhage).

Results 40 neonates (GA 24^{+2}–37^{+1} weeks [30 weeks], birth weight 600–3330 gram [1375 gram], IRDS grade I-III) were eligible. In 38 patients MIST was performed (2/40 were nonetheless intubated due to unrest). Tube insertion caused bradycardia with spontaneous recovery in one patient. Surfactant administration caused desaturation with spontaneous recovery in all patients and apnea in one patient. There were no complications. Therapeutic success was reached in 24/38 (63,2%) patients. In 6/24 (25%) respiratory adjustments were necessary; increasing PEEP in 2/24, starting nIPPV in 4/24. Causes for intubation 14/38 (27,8%) were rebound IRDS (6/14), sepsis (5/14) and insufficient drive to breath 2/14. Gestational age, birth weight, FiO2/IRDS degree, timing of MIST and gastric tube route (nasal/oral) were not correlated with success.

Conclusion Success factors for MIST are a calm patient, an adequate drive to breathe and the absence of sepsis.

PO-0734 EFFECT OF VOLUME-TARGETED VENTILATION IN EXTREMELY LOW BIRTHWEIGHT INFANTS UNDER HIGH FREQUENCY OSCILLATORY VENTILATION

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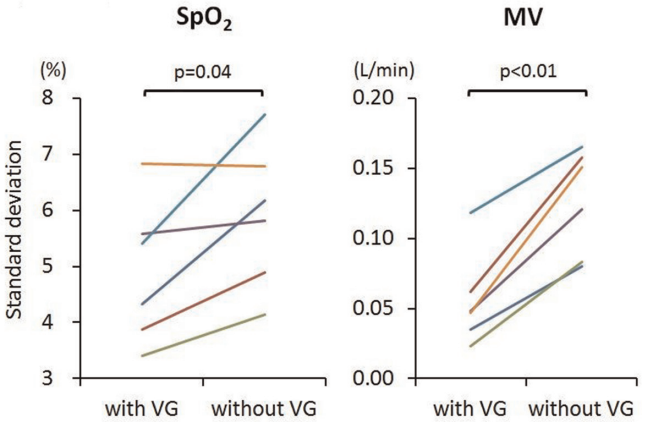
Background and aims Volume-targeted ventilation, or volume guarantee (VG) is known to improve neonatal prognosis in preterm infants, when added to conventional ventilation. Yet, VG effect is unclear when combined with pressure-controlled high frequency oscillatory ventilation (HFOV). The aim of this study is to investigate the effect of VG mode added to HFOV on respiratory parameters.

Methods We conducted a prospective study in extremely low birthweight infants who were ventilated after 28 days of age with HFOV (Babylog VN500). VG was applied for 8 h and VG was removed for the following 8 h. Frequency (12 Hz) and mean airway pressure were fixed during study period in each case. Tidal volume, amplitude, minute volume (MV), heart rate (HR) and oxygen saturation (SpO_2) data were analysed.

Results Six neonates were included (gestational age 22 w 5 d-23 w 6 d, birthweight 424–584 g). Standard deviations of both SpO_2 and MV with VG were significantly smaller than those without VG (Figure, pared t-test). HR fluctuation was not different. In total, desaturation episodes (SpO_2).



Abstract PO-0734 Figure 1

Abstract PO-0734 Table 1 Comparison of desaturation episodes

Case	with VG	without VG	p
1	10.1%	27.5%	<0.0001
2	1.3%	5.5%	<0.0001
3	0.5%	2.3%	<0.001
4	9.4%	8.6%	0.6
5	10.1%	9.1%	0.5
6	13.6%	13.3%	0.8
Total	7.4%	11.2%	<0.0001

Conclusions This pilot study suggests VG added to HFOV would attenuate fluctuation of SpO_2 and pCO_2, which leads to prevent hypoxia and hypocapnia, possibly resulting in preferable neonatal prognosis.

PO-0735 NASAL HFOV WITH BINASAL PRONGS IS EFFECTIVE AND FEASABLE IN ELBW NEWBORNS

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Introduction Noninvasive ventilation with nasal CPAP (n-CPAP), or nasalintermittant positive pressure ventilation (n-IPPV) is becoming standard ofcare in preterm. Limited experience has been reported withnasal high frequency oscillatory ventilation (n-HFOV). We present 2 newbornstreated by n-HFOV applied with binasal prongs (Ram cannula Neotech) and DraegerBabylog 8000+ ventilator.

Cases 1. A 900 gr. 28 weeks gestation infant was intubated, given surfactant and ventilated by volume guarantee pressure-support ventilation for RDS. On 2nd day HFOV was started due to worsening respiratory status. On 11th day patient was extubated to n-HFOV and continued for 4 days followed by n-IPPV/n-CPAP.

2. A 830 gr. 28 weeks gestation infant was resuscitated in the delivery room. RDS and pulmonary interstitial emphysema was detected on radiography and surfactant was given. At 12 h pneumothorax occurred necessitating thoracal tube insertion and HFOV. Conventional ventilation was tried several times without success. HFOV continued for 46 days then baby was extubated to n-HFOV. Patient required reintubation after 4 days due to sepsis.

Abstract PO-0735 Table 1 Respiratory support and blood gas data of 2 patients are presented.

	Case 1			Case 2		
	HFO	nHFO 4 h	nHFO 24 h	HFO	nHFO 4 h	nHFO 24 h
PH	7.27	7.31	7.25	7.32	7.24	7.26
PCO2	53	47.5	45.7	30.8	35.5	36.6
PO2	63.5	61.7	100	58.8	67	59.1
FiO2	27	50	30	30	30	30
Amplitude	70	100	100	85	85	85
MAP	10	13	13	10	10	10

Conclusion n-HFOV with binasal prongs could be an alternative for preterms after prolonged HFOV.

PO-0736 PRELIMINARY EXPERIENCE WITH THE USE OF NEURALLY ADJUSTED VENTILATORY ASSIST IN THE NEONATE

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Background and aims Invasive and non-invasive ventilation of the neonate may be associated with local and systemic complications due to mechanical trauma to lung tissues and their inflammatory response. A key objective of mechanical ventilation is to reduce its duration and side effects. Neurally Adjusted Ventilatory Assist (NAVA), a method that uses the electrical activity of the diaphragm (EAdi) as a signal to trigger the mechanical ventilatory breaths, may improve synchronisation between patient and ventilator and optimise the gas volume delivered to the lungs, according to the patient needs, eventually reducing volu- and biotrauma. We aimed to test the effectiveness of NAVA in the neonate.

Methods We present three preterm babies with severe respiratory distress syndrome that failed several attempts of weaning and extubation, and two full-term new-borns with amniotic fluid aspiration that could be successfully managed after changing from conventional ventilation to NAVA.

Results Our most frequent observations were a reduction in the Peak Inspiratory Pressure and in the need of FiO_2, after changing from S-IMV, A/C or Pressure Regulated Volume Control to NAVA. We also observed a reduction in respiratory rate and an increase in the patients' comfort. After extubation, during NIV--NAVA, the patients remained stable and confortable, even with the presence of air-leaks up to 90%. No patient required reintubation.

Conclusions NAVA is effective in weaning and extubation of neonates and seems to provide more comfort to the patients. Further studies are needed to assess whether short-term benefits are reflected in better outcomes in the long run.

PO-0737 PROPHYLACTIC SURFACTANT IN THE VERY PRETERM INFANT: CLINICAL PRACTICE SUPPORTS ADHERENCE TO EUROPEAN GUIDELINES ON RDS

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Background and aims Surfactant replacement therapy is key in the management of neonatal respiratory distress syndrome (RDS). Despite guideline updates on prophylactic surfactant (PS) use are increasingly more restrictive, outcomes remain improving. We aim to study clinical implementation of the 2010 update on management of RDS in very preterm infants in a tertiary NICU.

Methods Retrospective analysis of very preterm infants admitted to our NICU between 2010–2012. European 2010 RDS guidelines were progressively implemented during this period. We were able to compare patient characteristics and clinical outcomes of three groups: A) Fulfilled 2010 guidelines for PS; B) Did not fulfil 2010 guidelines and B1) Were given or B2) Were not given PS.

Results 277 preterms were admitted and divided into 3 groups: A) 75 fulfilled 2010 PS criteria; B1) 84 had PS despite absent criteria; B2) 118 did not have PS. Subgroup B1 had lower GA (29.1/30.3, $p < 0.001$) and lower BW than subgroup B2 (1175/1297 g, $p < 0.01$), but no significant differences were found in Apgar scores, CRIB or SNAPPE2. Subgroup B1 had higher rates of invasive ventilation than subgroup B2 (48/29%, $p < 0.01$), but lower need of rescue surfactant (11/31%, $p < 0.002$). No significant differences in mortality, chronic lung disease, length of stay or intraventricular haemorrhage were found.

Conclusions All the preterms who fulfilled 2010 criteria were given PS. Considering infants not fulfilling the 2010 criteria, outcomes were not different between those who got PS and