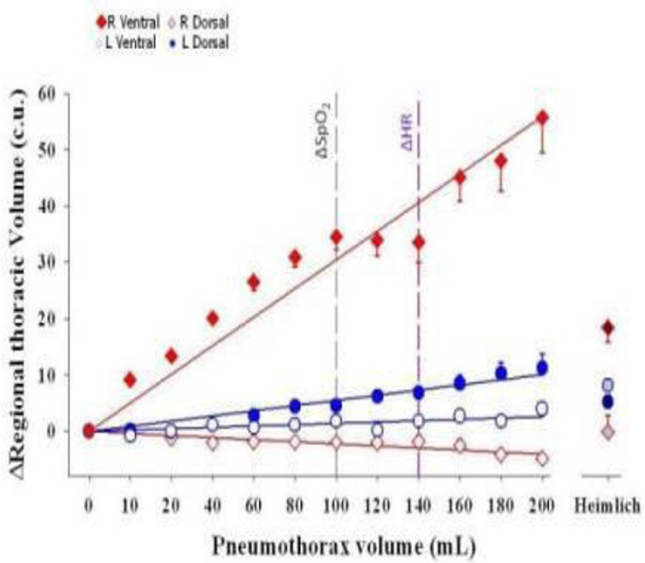
ANOVA) and tachycardia mean (SD) to 245 (44) bpm occurred at 140 mL instillation (p=0.001).



[Regional thoracic volume vs Pneumothorax size]

Conclusions: EIT accurately identified the location of even small volume pneumothoraces before physiological parameters changed.

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HELIOX IN THE MANAGEMENT OF NEONATES WITH MECONIUM ASPIRATION SYNDROME (MAS)

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The aim of the study was to asses the influence of short-term mechanical ventilation with helium-oxygen mixture (heliox) in newborns with MAS on basic vital signs, oxygenation, acid-base balance and respiratory mechanics.

The study was carried out in newborns with respiratory failure requiring mechanical ventilation due to MAS.Patients were ventilated using PC-SIMV. Parameters of mechanical ventilation,respiratory mechanics,oxygenation,acid-base balance and vital signs were recorded during three periods of one hour before,during and after heliox ventilation.

Nine newborns with MAS were enrolled in the study. Mechanical ventilation with heliox did not affect vital signs, and infants' general condition remained stable during and after ventilation with heliox. Mechanical ventilation with heliox was associated with a statistically significant increase in dynamic compliance(mean 0,4 vs 0,53ml/cmH_2O).Heliox caused an increase in tidal volume(mean 5,57 vs 6,84ml/kg)and minute ventilation(mean 0,87 vs 0,95l)but this was not statistically significant. Mechanical ventilation with heliox allowed the use of significantly lower fractions of inspired oxygen(mean 0,62 vs 0,35),with a significant decrease in the oxygenation index(mean 8,09 vs 4,26)and alveolar-arterial oxygen tension difference(mean 320,04 vs 127,65mmHg).A significant increase in pH(mean 7,34 vs 7,38) was also observed with a concomitant decrease in $PaCO_2$(mean 43,4 vs 39,9)which was not statistically significant.Beneficial effects of heliox reversed after ventilation with this gas mixture was stopped.Patients required higher FiO_2(mean 0,35 vs 0,38),OI(mean 4,26 vs 5,27)and $AaDO_2$(mean 127,65 vs 159,6)increased.There was also a significant decrease in oxygen saturation(mean 93,69 vs 91,63).

Ventilation with heliox had a positive effect on the selected parameters of oxygenation,acid-base balance and respiratory mechanics in newborns with MAS.

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VOLUME-TARGETED VENTILATION REDUCES THE RISK OF DEATH OR BPD: A COCHRANE META-ANALYSIS

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Background and aims: Volutrauma is associated with neonatal lung injury. Modern ventilators offer volume-targeted modes aiming to reduce volutrauma and improve $PaCO_2$ stability. The objectives were to determine whether volume-targeted ventilation (VTV), compared with pressure-limited ventilation (PLV), reduces mortality, bronchopulmonary dysplasia (BPD) and other outcomes.

Methods: Cochrane systematic review of randomised clinical trials comparing VTV with PLV. Risk ratios (RR) or weighted mean difference with

95% confidence intervals (CI) were obtained from meta-analysis using a fixed effect model. Numbers needed to treat (NNT) were derived from risk differences.

Results: Nine parallel trials (629 infants) and three crossover trials (64 infants) met inclusion criteria. There was no difference in hospital mortality [RR 0.80 (95% CI 0.53, 1.20)]. The use of VTV-modes resulted in a reduction in the combined outcome death or BPD [RR 0.73 (95% CI 0.57 to 0.93), NNT 8 (95% CI 5 to 33)]. VTV-modes also resulted in reductions in pneumothorax [RR 0.46 (95% CI 0.25 to 0.84), NNT 17 (95% CI 10 to 100)], days of ventilation [MD -2.36 (95% CI -3.9 to -0.8)], risk of hypocarbia [RR 0.56 (95% CI 0.33 to 0.96), NNT 4 (95% CI 2 to 25)] and the combined outcome PVL or grade 3-4 IVH [RR 0.48 (95% CI 0.28 to 0.84), NNT 11 (95% CI 7 to 50)].

Conclusions: Infants ventilated using VTV-modes had reduced death or BPD compared with infants ventilated using PLV-modes. Further research is needed to identify whether VTV-modes improve neurodevelopmental outcomes, and to determine best VTV practice.

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ADVANTAGES OF "INSURE" METHOD IN RDS PRETERM INFANTS

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Background: "INSURE" (INtubation, SURfactant, Extubation) is an individualized therapy for RDS treatment of preterm infants, whose utilization in terms of efficacy and failure has not been completely defined in comparison to "rescue" mode.

Objective: Determine INSURE utilization, efficacy (post-treatment FiO_2 and $aAPO_2$ decrease), and failure (surfactant repetition) in comparison to traditional rescue mode supplementation.

Materials and methods: Among 824 premature infants NICU admitted at Padua University Hospital during 2006-2009, 209 (25.4%) were managed by rescue surfactant replacement (100 mg/kg, Curosurf®) if required < 40% oxygen, including 42 (20.1%) by "INSURE" mode. Each INSURE premature infant was compared to 2 consecutive controls, matched for delivery route, gestational age, and sex.

Results: INSURE premature infants, comparable for antenatal steroids, Apgar score, and birth weight showed a significantly higher efficacy in terms of post-treatment median (IQR) FiO_2 (26 (21 - 40) vs 21 (21 - 29; p=0.03) and $aAPO_2$ (0.48 (0.45-0.60) vs 0.58 (0.53-0.72);p=0.03) decrease. In addition, INSURE group required less surfactant repetition (16 vs 44,4%; p 0.01).

Conclusions: Our data proved "INSURE" significant efficacy in reducing post-treatment oxygen requirement and surfactant repetition in RDS infants in comparison to traditional "rescue" mode.

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NASAL INTERMITTENT POSITIVE PRESSURE VENTILATION VERSUS NASAL CONTINUOUS POSITIVE AIRWAY PRESSURE FOR NEONATAL RESPIRATORY FAILURE: A PROSPECTIVE, RANDOMIZED, CONTROLLED STUDY

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Objective To evaluate whether nasal intermittent positive pressure ventilation (NIPPV) compared with nasal continuous positive airway pressure (nCPAP) would decrease the requirement for endotracheal ventilation in the treatment of respiratory failure in preterm and term infants.

Methods: Prospective, randomized, controlled, single-center study. 101 neonatal infants were randomized into NIPPV group (n=48) and nCPAP group (n=53) between January, 2008 and December, 2008 in a neonatal intensive care unit of a tertiary hospital. The ratio of requirement for endotracheal ventilation and the outcome were investigated.

Results: Neonates treated with NIPPV and with nCPAP had comparable clinical conditions at study entry. Infants treated initially with NIPPV need less endotracheal ventilation than those treated with nCPAP (23% vs 38%, p< 0.05). However, there was no significant difference between NIPPV group and nCPAP group in the ratio of good outcome (94% vs 87%, p>0.05).