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 FiO₂ and aAPO₂ 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) FiO₂ (26 (21 - 40) vs 21 (21 - 29; p=0.03) and aAPO₂ (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).

Conclusion: NIPPV compared with nCPAP decreased the requirement for endotracheal ventilation in neonatal infants with respiratory failure.

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USE OF NASAL CPAP IN INFANTS WITH BRONCHIOLITIS IN THE SOUTH OF ENGLAND: A PROSPECTIVE, MULTICENTRE, OBSERVATIONAL STUDY

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Aim: To review the use of nasal CPAP (nCPAP) in infants with bronchiolitis.

Methods: A prospective, multicentre, observational study was undertaken from 1st November 2008 to 28th February 2009. Seven Paediatric Units in the South of England participated in the study. Data was collected on indications for nCPAP, respiratory rate and blood gases prior to nCPAP, total number of days on nCPAP and length of hospital stay.

Results: A total of 51 infants with the clinical diagnosis of bronchiolitis required nCPAP during the study period. The main indications were increased work of breathing (47.0%), apnoeas (39.2%) and increasing oxygen requirements (23.5%). Among them 16 were ex-preterm (31.37%).

Prior to nCPAP the mean respiratory rate was 63/min (range 28 to 120), mean oxygen saturations 85% (70 to 98%), mean pH 7.25 (7.03 to 7.36) and mean PCO₂ 10.42 (4.36 to 19.0).

The average time on nCPAP was 2.6 days (2 hours to 11 days) and the average length of hospital stay was 10.96 days (5 to 22 days).

11 out of the 51 infants failed trial on nCPAP requiring intubation (21.5%). The main indications were apnoeas (45.45%), CO₂ retention (36.36%) and increasing work of breathing (36.36%).

7 out of the 11 infants requiring intubation were ex-preterm (63.6%) and 8 had significant PCO₂ rise (>8) prior to the trial of nCPAP (72.72%).

Conclusions: nCPAP has a good success rate in bronchiolitis. In our study, predictive factors associated with nCPAP failure were prematurity and high CO₂ retention prior to trial of nCPAP.

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NON INVASIVE VENTILATION IN PEDIATRIC STATUS ASTHMATICUS: A PROSPECTIVE OBSERVATIONAL STUDY

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Objective: Non invasive ventilation (NIV) has been shown to be effective in different causes of respiratory failure in both adult and pediatric patients. However, its role in status asthmaticus (SA) remains unclear. We designed a prospective study to assess the response of children with SA to NIV.

Patients and methods: We conducted a prospective, observational, single-center study in a teaching hospital. Children with SA unresponsive to conventional therapy with a modified Wood's clinical asthma score (m-WCAS) ≥ 4 after this treatment, were included. Patients were placed on pressure support NIV in spontaneous/timed mode. During NIV therapy, salbutamol was nebulized continuously and ipratropium bromide every two hours; methylprednisolone was given at a dose of 1-2 mg/kg/6 hours. Clinical variables were measured at baseline and at 1, 6, 12, 24 and 48 hours.

Results: During the study period, 122 children with SA were admitted to the PICU; 72 fulfilled inclusion criteria. Baseline mean values were as follows: m-WCAS of 5.7 points, heart rate (HR) of 166.7 beats/minute, respiratory rate (RR) of 49.5 breaths/minute and FiO₂ of 45.3%. In the first hour m-WCAS fell 2.3 $\pm$ 1.5 points, HR 13.5 $\pm$ 14 beats/minute and RR 9.8 $\pm$ 10 breaths/minute ($p < 0.001$). Despite NIV therapy, 5 children required intubation due to increasing respiratory distress. There was one case of barotrauma, with no other serious adverse effects associated with NIV.

Conclusions: These results suggest that NIV is an effective and safe therapy in children with SA unresponsive to conventional treatment. Its effects are seen from the first hours of NIV therapy.