Introduction

Guidelines on neonatal cardiopulmonary resuscitation (CPR) suggest the provision of coordinated compressions to inflations at a rate of 3:1. However, manikin studies, and human trials have shown that coordinated chest compression/manual ventilation is difficult to achieve. In a manikin study, we aimed to investigate how music might help to control CPR in neonates.

Methods

36 medical professionals were trained in neonatal resuscitation with and without listening to music (Radetzky-Marsch). CPR was performed using a neonatal lung model and a T-piece resuscitator for manual ventilation. Chest compressions were counted using a mechanical tally counter and the rate of inflations were recorded using a respiratory monitor.

Results

A total of 2514 inflations and 7678 chest compressions were analysed, with a median (interquartile range, IQR) number of chest compressions of 213 (196–229) and 70 (66–76) inflations per participant. Without music the median (IQR) rate of chest compressions was 115 (100–129)/min and the rate of inflations was 38 (32–42)/min. While listening to the Radetzky-Marsch the rate of chest compressions decreased significantly to 96 (96–100)/min (p = 0.002) and the rate of inflations decreased to 32 (30–34)/min (p = 0.001). Furthermore, with music the IQR of chest compression rate decreased by 8% and the IQR inflation rate by 60%.

Conclusion

A musical mnemonic has a significant impact on the delivery of neonatal CPR. Listening to music optimizes the rate of chest compressions and inflations and reduces the variability between individuals.

1778

PREDICTING FAILURE OF THE INTUBATION-SURFACTANT-EXTUBATION PROCEDURE IN VERY PRETERM INFANTS

doi:10.1136/archdischild-2012-302724.1778

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Background and Aims

Respiratory Distress Syndrome can be treated with the INtubation-SURfactant-Extubation procedure (INSURE). INSURE-failure, with the need for re-intubation and mechanical ventilation, is common. We studied predictors of INSURE-failure to identify high-risk neonates that may benefit from staying intubated and mechanically ventilated after surfactant.

Methods

We studied 363 very preterm infants (< 32 weeks) born 1998–2010 and treated with surfactant. Data were systematically retrieved from their medical records. We defined INSURE as extubation within 2 hours of intubation, and INSURE-failure as re-intubation within 72 hours.

Results

Currently 219 of these 363 patients have been assessed; 96 were treated with INSURE (Table) and 123 needed prolonged mechanical ventilation. Newborns treated with INSURE had a median gestational age of 29 weeks and a median birth weight of 1158g.

Abstract 1777 Table 1

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>INSURE-success (n=74)</th>
<th>INSURE-failure (n=22)</th>
<th>Odds Ratio (Unadjusted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age &lt;28 weeks</td>
<td>22 (29.7)</td>
<td>13 (59.1)</td>
<td>3.4 (1.3–9.1)</td>
</tr>
<tr>
<td>Birth weight &lt;1000g</td>
<td>25 (33.8)</td>
<td>9 (40.9)</td>
<td>1.4 (0.5–3.6)</td>
</tr>
<tr>
<td>5 min. APGAR &lt;10</td>
<td>27 (38.5)</td>
<td>13 (61.9)</td>
<td>2.8 (1.1–7.7)</td>
</tr>
<tr>
<td>No antenatal steroids</td>
<td>6 (8.1)</td>
<td>3 (14.3)</td>
<td>1.9 (0.4–8.3)</td>
</tr>
<tr>
<td>Surfactant in delivery room vs. NICU*</td>
<td>7 (9.5)</td>
<td>5 (22.7)</td>
<td>2.8 (0.8–10.0)</td>
</tr>
</tbody>
</table>

* Neonatal Intensive Care Unit

Conclusion

These preliminary results suggest an increased risk of INSURE-failure in infants with a gestational age < 28 weeks, 5 minutes APGAR < 10, and surfactant administration in the delivery room. Keeping these newborns surfactant after surfactant may prevent a high-risk re-intubation.

1779

CELL DEATH GENES ARE INDUCED IMMEDIATELY AFTER HYPOXIA-REOXYGENATION (HR) IN THE NEWBORN MOUSE LUNG

doi:10.1136/archdischild-2012-302724.1779

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Background and Aims

HR-injury can induce generation of reactive oxygen species which activate anti-/pro-apoptotic signalling in the cell or cause direct cell damage. The lungs of newborn neonates are susceptible to HR-injury. To explore underlying mechanisms, a temporal profile of a priori selected genes was performed.

Methods

84 C57BL/6 mice postnatal day 7 were randomized to 120 min of hypoxia (FiO2 0.08, n=64) or 180 min in air (C21, n=20). The hypoxia group was further randomized to 30 min reoxygenation with FiO2 0.60 (H60) or air (H1). Lung tissue was harvested after observation in air for 0, 150, 300 min or 3 days and 44 mRNA transcripts were analyzed by real-time PCR.

Results

Bcl2, Bcl2l1, Bnip3 and Gadd45g were significantly up-regulated (p<0.05), and Cond1, Chek1 and Casp3 down-regulated in H60vsC21 and H1vsC21 (0 min). Apaf1 and Apaf1 were also down-regulated in the comparison H60vsC21. After 150 min Apaf1, Bcl2, Casp3, Cond1, Chek1 and Mussh were down-regulated for H60vsC21 and H1vsC21. Bcl2 continued to be down-regulated in both comparisons (300 min). Gadd45g was only up-regulated in H60vsC21 after 150 and 300 min. No significant gene expression changes were observed after 3 days.

Conclusion

HR-injury in the newborn lung induces an immediate alteration in the expression of both anti- (Bcl2, Bcl2l1) and pro-apoptotic genes (Bnip3, Apaf1, Apaf1, Gadd45g), while cell-cycle genes (Cond1, Chek1) are suppressed. A suppression of Bcl2 from 150 min and a continuous up-regulation of Gadd45g after hyperoxic reoxygenation may indicate early phase of DNA damage-induced apoptosis.

1780

EFFECT OF NASAL SYNCHRONIZED INTERMITTENT MANDATORY VENTILATION VERSUS NASAL CONTINUOUS POSITIVE AIRWAY PRESSURE IN REDUCING REINTUBATION OF EXUBTED PRETERM INFANTS

doi:10.1136/archdischild-2012-302724.1780

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Background

Nasal flow-synchronized intermittent mandatory ventilation (NSIMV) is a new non-invasive ventilatory mode that delivers synchronized mechanical breaths through the nasal tube.

This study was conducted to compare the efficacy of NSIMV and NCPAP (nasal continuous positive airway pressure) in reducing reintubation of extubated preterm infants.

Methods

This randomized clinical trial was conducted in Gaem NICU of mass had medical university from September 2009 through June 2010.

Preterm infants who had respiratory distress syndrome and required endotracheal intubation within 48h of birth and met specific predetermined criteria for extubation by day 30 of life were recruited. Each infant was randomized to receive either NSIMV or NCPAP soon after extubation. Extubation was deemed successful if...
re-intubation was not needed for at least 48h. Brain sonography was done before extubation and after 48h sample size was determined with 95% confidence and 90% power. Data was analyzed with spss 11.5 and Chi-square test.

Results There were no significant differences in clinical characteristics between the two groups at randomization.

Fifty-four percent (14/25) infants were successfully extubated to NSIMV compared with 52% (13/25) to NCPAP (p = 0.78). Infants assigned to NCPAP had higher arterial CO2 pressure level than those assigned to NSIMV (p = 0.002).

Neither procedure induced major adverse effects despite more elevation in IVH grade during SIMV.

Conclusions NSIMV in the post-extubation period is safe, however it’s not more effective than NCPAP in preventing re-ventilation.

1781 THE PREDICTIVE FACTORS IN THE PROGRESS OF TRANSIENT TACHYNEA OF THE NEWBORN

doi:10.1136/archdischild-2012-302724.1781

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Aim To determine the clinical risk factors to predict the progress of TTN in late-preterm and term infants.

Methods The infants with the diagnosis of TTN were evaluated retrospectively. Patients were divided into two groups according to the intensity of respiratory support. Group-1 received any ventilatory support, where group-2 only oxygen. Clinical findings, Richardson and Silverman scores were compared.

Results One-hundred-six (19.1%) infants were evaluated (68 in group-1, 38 in group-2). Mean gestational age and birth weight were lower in group-2. The C/S and male gender rates were similar. Richardson scores, Silverman scores, peak-respiratory rates (pRR) and oxygen need (FiO2) in the first 24-hours were higher, duration of repositioning.

Conclusion Adherence to guideline is associated with significant reduction in need for ETT repositioning. Publication of guideline has had limited effect. There is need for improving dissemination of evidence based guidelines to improve outcomes.


1782 ENDOTRACHEAL TUBE POSITION IN VENTILATED NEONATES - DOES EVIDENCE INFLUENCE PRACTICE?

doi:10.1136/archdischild-2012-302724.1782

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Background Malpositioned endotracheal tubes (ETT) in ventilated neonates are associated with adverse pulmonary outcomes including unequal surfactant delivery, asymmetric lung expansion and air-leaks.1 Use of gestation age (GA) based guideline to determine the ETT length at lips resulted in reduction of the need for ETT repositioning from 55% to 8%.2 This guideline is recommended by ILCOR.3

Aim To assess adherence to guidelines and need for ETT repositioning.

Methods Ventilated neonates < 24 hours of age, transferred by a regional transfer service during study periods of January to March (3-months) in the years 2008 (pre-publication) and 2011 (post-publication) were included. Demographic data, ETT size, length at upper-lip, position on chest X-ray and need for repositioning were collected.

Results Similar proportion of ETT’s were repositioned during 2008 and 2011 (30% vs 37%, p=0.59). During both periods the proportion of ETT’s repositioned were significantly higher (p<0.05) with greater deviation of ET length insertion from the guideline:

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>ETT at recommended length</td>
<td>3/15 (20%)</td>
<td>3/20 (15%)</td>
</tr>
<tr>
<td>ETT +/-0.5cm deviation from guideline</td>
<td>9/38 (25%)</td>
<td>7/21 (33%)</td>
</tr>
<tr>
<td>ETT &gt;0.5cm deviation from guideline</td>
<td>9/15 (60%)</td>
<td>16/29 (55%)</td>
</tr>
</tbody>
</table>

Conclusion Adherence to guideline is associated with significant reduction in need for ETT repositioning. Publication of guideline has had limited effect. There is need for improving dissemination of evidence based guidelines to improve outcomes.


1783 HOW SAFE ARE DELIVERY ROOM MANEGEMENTS TO PREVENT EARLY HYPOCARBIA?

doi:10.1136/archdischild-2012-302724.1783

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Background and Aim Clinically determining appropriate respiratory support from the point of delivery to the NICU is difficult and inadvertent overventilation may be common. The aim of the study was to determine whether delivery room managements done by skilled team will produce ‘normocarbic’ blood gas values in <29 weeks’ preterm infants.

Method A prospective cohort study was designed and infants born before 29 weeks’ from January 2009 to December 2011 were enrolled. All infants received 100 mg/kg prophylactic surfactant in delivery room. During resuscitation, stabilization, surfactant administration and transport infants were ventilated with a T-piece resuscitator. If respiratory drive was present, infants were extubated to nasal CPAP through short binalar prong. FiO2 was adjusted to achieve SaO2 of 88–92% which was monitored by pulse oxymeter. Carbon dioxide (CO2) levels on admission and early NICU hours (0–6 hours) were evaluated.

Results Fifty-nine infants were included with a mean gestation age of 26.2±1.7 (23–28.6) weeks and a birth weight of 857±237 (400–1477). The mean pCO2 levels of the first blood gas analysis was 45.3±9.8 (range 30.4–71.2). Four (6.8%) infants had hypocarbia (pCO2 < 35 mmHg).

Conclusion To prevent both hypoxia and hypocarbia from the point of delivery to the NICU is a challenge. More caution is required to prevent hypocarbia and hypoxia.

1784 RESPIRATORY MORBIDITY IN TERM INFANTS DELIVERED BY ELECTIVE CAESAREAN SECTION: COHORT STUDY

doi:10.1136/archdischild-2012-302724.1784

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Background Respiratory morbidity of term infants delivered by elective cesarean section (ECS) has been reported in the literature. It has been suggested that ECS might increase the risk of respiratory morbidity in term infants. This study aimed to determine whether ECS increases the risk of respiratory morbidity in term infants.

Methods A retrospective cohort study was conducted at the Obstetric-Gynecologic University Hospital Nr 1, Tirana, Albania. All term infants born by ECS in the years 2007–2009 were included. The control group consisted of term infants born vaginally. The study was approved by the institutional review board.

Results A total of 146 term infants were included in the study (77 ECS and 69 vaginally). The median gestational age was 40 weeks (range 39–41 weeks) in both groups. The median birth weight was 3400 grams (range 2500–4500 grams) in the ECS group and 3450 grams (range 2500–4500 grams) in the vaginally group. The median Apgar score at 1 minute was 9 in both groups. The median Apgar score at 5 minutes was 9 in both groups. The incidence of respiratory morbidity was similar in both groups (ECS: 20.5%, vaginally: 17.4%). The incidence of respiratory morbidity was similar in both groups for males (ECS: 21.4%, vaginally: 16.7%) and females (ECS: 19.6%, vaginally: 21.6%). The median length of hospital stay was similar in both groups (ECS: 3 days, vaginally: 3 days).

Conclusion ECS does not increase the risk of respiratory morbidity in term infants. The median Apgar score was similar in both groups. ECS does not increase the risk of respiratory morbidity in term infants.