

1805 OXYGEN SATURATION MONITORING AT BIRTH: FEASIBILITY OF THE 2010 NEONATAL RESUSCITATION GUIDELINES

doi:10.1136/archdischild-2012-302724.1805

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Background The 2010 Neonatal Resuscitation Guidelines recommend preductal transcutaneous oxygen saturation (SpO₂) monitoring at birth.

Objective To verify the feasibility of SpO₂ monitoring at birth by determining the time to get the first SpO₂ value using a pulse oximeter.

Methods The study included 100 healthy newborns at term by elective caesarean section (Elective CS, 50 neonates), vaginal delivery (VD, 32 neonates) and emergency caesarean section (Emergency CS, 18 neonates). A Masimo Radical-7 (Masimo, Irvine, CA) pulse oximeter sensor was applied on neonatal right hand noting the minute at which the first oximetry value was provided. For the comparison between the time to get the first oximetry value among the three groups, Chi Square and Fisher Exact Test were used. A p value < 0.05 was considered statistically significant.

Results In the total study population, 52% of SpO₂ values were obtained within the first minute of life; 28% in the second; 13% in the third; 3% in the fourth; 3% in the fifth; 1% in the sixth.

However, the first SpO₂ value was more frequently obtained within the first minute of life in newborns by Elective CS (74%) and by Emergency CS (61%) than in those by VD (12.5%), p<0.05.

Conclusions The first minute after birth is critical for Apgar score and neonatal resuscitation. This study demonstrated that SpO₂ is not always rapidly measurable, especially in neonates born by VD. A change in current clinical practice is therefore required.

1806 MOLECULAR MECHANISMS OF PERINATAL LUNG FLUID CLEARANCE IN TERM NEWBORNS

doi:10.1136/archdischild-2012-302724.1806

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Background and Aim The perinatal switch from secretion to absorption in airway fluid transport includes increase in gene expression and activity of ion channels, e.g. apical amiloride-sensitive epithelial sodium channel (ENaC) and basolateral Na-K-ATPase. The serum- and glucocorticoid-induced kinase (SGK) may induce ENaC and Na-K-ATPase.

Our objective was to study airway expression of SGK1, Na-K-ATPase α 1-subunit and α ENaC during adaptation in term infants.

Methods 86 term infants (GA= 39.43 \pm 0.91; mean \pm SD) were included in the study (vaginal delivery, VD, n=25 and elective caesarean section, CS, n=61). Within 3 hours and at 22–29 hours after delivery airway cell samples were obtained from the infants' nasal epithelium. α ENaC, Na-K-ATPase α 1-subunit, and SGK1 mRNAs in the samples were quantified with real-time RT-PCR and normalized to cytokeratin 18 (CK18).

Results ENaC and Na-K-ATPase α -subunit mRNA amounts were similar after VD and CS. During the first postnatal day Na-K-ATPase α 1 gene expression decreased in infants delivered by CS (p<0.001). After CS SGK1 mRNA was higher at < 30 min than at 1–3 hours of age (p<0.001). Within 3 hours after vaginal delivery ENaC and

Na-K-ATPase α -subunit mRNA correlated with SGK1 mRNA (r = 0.46, p= 0.04, and r=0.63, p=0.005, respectively).

Conclusions Na-K-ATPase α 1 is highest during early adaptation coinciding with the challenge of fluid absorption during immediate postnatal life. High SGK1 may be related perinatal stress. SGK1 dependent induction of ENaC and Na-K-ATPase may be an important physiological mechanism for lung fluid clearance.

1807 THE COMPARISON OF FORKHEAD BOX M1 MRNA EXPRESSION OF LUNG TISSUES BETWEEN PRETERM AND TERM RABBITS

doi:10.1136/archdischild-2012-302724.1807

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Background Recent reports on Forkhead box m1 (Foxm1) of the mice provided correlations between this gene and lung maturation. However, there has been no study on human Foxm1 concerned with lung maturation. The purposes of this study are to compare the mRNA expression of SP-A, -B, -C and Foxm1 gene of preterm rabbits to that of mature term ones and to trace the relationship between Foxm1 and lung maturation.

Methods Pregnant New Zealand White rabbits were grouped according to gestational age. The cesarean sections were carried out after the group was divided into two groups of 30–31 days of gestation (Term group) and 26–27 days of gestation (Preterm group). The numbers of fetus rabbits of each group were 18. We compared the expression levels of mRNA of SP-A, -B, -C and Foxm1 by using RT-PCR and real-time RT-PCR (qRT-PCR).

Results When relative ratio of SP-A, -B, and -C mRNA expression level of term group was 1, there were markedly decreased expressions of them in preterm group-0.380, 0.563, and 0.448 respectively in order in qRT-PCR. On the contrary to these results, Foxm1 expression was increased in preterm group and its relative expression ratio was 1: 2.166 on both RT-PCR and real-time RT-PCR (P<0.01).

Conclusion The preterm rabbits showed two times more mRNA expression of Foxm1 gene in their lungs than full terms. This Foxm1 is the gene associated for lung maturation of preterm rabbits.

1808 PORACTANT ALFA THERAPY ASSOCIATED WITH C-REACTIVE PROTEIN RISE

doi:10.1136/archdischild-2012-302724.1808

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Background and Aims French and Finnish studies report a rise in C-reactive protein [CRP] after poractant alfa [PA] therapy; we have made a similar observation. Neither study excluded perinatal infection as a cause. This research hypothesized that the rise in CRP was not caused by infection but rather by a reaction to PA.

Methods This study reviewed newborns weighing < 1500 g at birth with respiratory distress syndrome [RDS] and who received PA. Clinical and radiographic criteria defined RDS. Clinical and laboratory findings established that infection was not present in the mother or infant (inclusion criteria). Infants given PA were compared to infants with RDS and no therapy [NO-PA]. A CRP measurement \geq 1 mg/dL was considered elevated. SPSS was used for statistical analyses.

Results The 2nd and 3rd CRP rose in PA v. a decline in NO-PA [Table]. Tracheal aspirate and blood cultures had no growth in all subjects.

Abstract 1808 Table 1 CRP results

Group	n =	CRP	Result	t-test
PA v. NO-PA	82 vs. 22	#1	0.5 +1.2 vs. 0.4+0.4	p = 0.33
PA v. NO-PA	78 vs. 14	#2	1.0+1.3 vs. 0.4+0.3	p<0.01
PA v. NO-PA	61 vs. 6	#3	1.1+1.7 vs. 0.2+0.0	p<0.01

Conclusions CRP significantly increased in PA v. NO-PA supporting prior reports. We theorize inflammation is caused by peroxidation of polyunsaturated fatty acids in PA. A clinical trial is needed that studies cytologic and biochemical findings in tracheal aspirates after PA therapy and this will alleviate safety concerns.

1809 REDUCED DURATION OF CPAP IN PRETERM BABIES RECEIVING KANGAROO CARE WITHIN AN HOUR OF BIRTH - RANDOMIZED TRIAL

doi:10.1136/archdischild-2012-302724.1809

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Background and Aims Kangaroo Mother Care (KMC) is conventionally initiated in a baby who is otherwise stable but may still be on intravenous fluids, tube feeding and/or oxygen. We hypothesized that initiating KMC earlier will reduce the requirement for oxygen and the duration of respiratory support if Continuous Positive Airway Pressure (CPAP) was started along with Kangaroo care immediately after delivery in premature babies with respiratory distress.

Methods Prospective randomized controlled trial in a total of 16 preterm neonates with respiratory distress syndrome who were assigned to CPAP (Fischer Paykel Bubble CPAP generator with short bi-nasal prongs) with or without KMC within 1 hour of starting CPAP. Primary outcome was requirement of oxygen and mechanical ventilation. Secondary outcome was early initiation of feed, apnoeic episodes and number of days for achieving maximum feed.

Results 13 babies were randomised into intervention group and 12 in control group. The mean weight was 1.51kg (SD=0.47) and gestational age range of 26–32 weeks. Babies took 34.08 hrs to wean off in CPAP with KMC as compared to 38.67 hrs in those who received only CPAP. On weaning from CPAP there was no oxygen requirement and no apnoeic episodes in both groups. Average days to reach maximum feeding were two days with no differences between groups. Intolerance of feed was a problem in the non-intervention group.

Conclusion KMC is feasible in babies on CPAP irrespective of weight and prematurity. It reduced the number of hours on CPAP and reduced intolerance of feeds.

1810 VALUE OF PORTABLE TRANSTHORAC ULTRASOUND TO AID ENDOTRACHEAL PLACEMENT IN EXTREMELY LOW BIRTH WEIGHT INFANTS IN THE DELIVERY ROOM

doi:10.1136/archdischild-2012-302724.1810

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Background and Aims Correct endotracheal tube (ETT) position for extremely low birth weight (ELBW) neonates during initial resuscitation is critical. We aimed to, 1. Assess the feasibility and diagnostic utility of portable transthoracic ultrasound (PTU) to assess symmetry of diaphragmatic movement as a measure of

correct ETT, 2. Assess PTU as a recordable accurate tool to document ETT position prior to surfactant administration to improve the 'golden hour management'.

Methods Single centre prospective study involving ELBW neonates < 1000 gm requiring intubation post-delivery. Two recordings per infant were done - one in delivery room and second when the infant reaches NICU. Accuracy of PTU (Micromaxx®) was compared with clinical assessments, colorimetric CO₂ detection and Chest X-ray ETT position. Single operator conducted examinations who was not part of the resuscitation team. Hospital Research and Ethics committee approval was obtained.

Results Seventeen ELBW infants had PTU in labour delivery room (n=17) yielding 34 recordings. For 5 out of 17 (29.4%) infants significant improvement of ETT position could be offered by the use of PTU which otherwise was not detected. It is feasible to measure and record diaphragmatic excursion bilaterally during the labour ward resuscitation environment. The diagnostic accuracy of PTU for correct ETT was greater than that by traditional clinical methods and colorimetric CO₂ detection. Inter-operator consistency and value of hand-held device (VScan®) is being evaluated.

Conclusion PTU is a valuable adjunct tool to record symmetry of diaphragmatic movement as a measure of correct ETT placement in labour ward for ELBW infants.

1811 HIGH-FLOW NASAL CANNULAE FOR RESPIRATORY SUPPORT OF PRETERM INFANTS: A REVIEW OF THE EVIDENCE

doi:10.1136/archdischild-2012-302724.1811

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Background High-flow nasal cannulae (HFNC) are gaining in popularity as a form of non-invasive respiratory support for preterm infants in neonatal intensive care units around the world. They are proposed as an alternative to nasal continuous positive airway pressure (NCPAP) for treating respiratory distress in a variety of clinical situations, including post-extubation support, primary therapy from birth, and to 'wean' from NCPAP.

Objectives To present and discuss the available evidence for the use of HFNC in various roles in the preterm population.

Methods We performed an internet-based literature search for relevant, original research articles (both randomised and not) on the use of HFNC in preterm infants.

Results 18 studies were included in the review. Distending pressure generated by HFNC in preterm infants increases with increasing flow rate and decreasing infant size, and may vary according to the amount of leak around the prongs. HFNC may be as effective as NCPAP at improving respiratory parameters such as tidal volume and work of breathing in preterm infants, but perhaps only at flow rates >2 Litres per minute. Based on available published evidence, the efficacy and safety of HFNC in preterm infants remain to be determined.

Conclusions There is increasing evidence from clinical trials to support the use of HFNC treatment of preterm infants with respiratory failure, however uncertainty remains about efficacy, safety and optimal flow rates. Until the results of randomised trials in progress are known, widespread use of HFNC to treat preterm infants cannot be recommended.