



September 17th, 2021 08:30 - 10:30

PARALLEL SESSION 21 - RESUSCITATION 1

ID 324. VIDEO ANALYSIS OF THERMAL CARE FOR VERY PRETERM INFANTS IN THE DELIVERY ROOM

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Objective:

Hypothermia is an independent risk factor for mortality in preterm infants. Neonatal resuscitation guidelines now recommend waiting for at least 1 minute after birth before cord clamping (CC) in uncompromised preterm infants. We aimed to observe and document the timing of warming interventions in the era of “delayed cord clamping”.

Study design:

We observed video room recordings of infants born <32 weeks' gestation at our hospital between September 2016 – March 2020. We estimated time of CC based on the time of arrival to the resuscitation trolley. We determined the time from birth to placement under radiant heat, application of a hat and a polyethylene bag (PB). We report the proportion of infants in whom these tasks were completed within 60 seconds from (i) birth and (ii) arrival at the resuscitation trolley. We recorded the median time to perform each task. Results: 108 videos were suitable for analysis (median [IQR] gestational age 27 [26-29] weeks and birth-weight 1007 [780-1303] grams). Seventeen (15%) infants underwent CC <60 seconds after birth. Sixty seconds after birth; Seventeen (16%) infants were under radiant heat and 12 (11%) had a hat placed. Seventeen (15%) infants were placed in a PB prior to arrival at the resuscitation trolley. Most (n= 88, 98%) of the remainder were not in a PB by 60 seconds after birth. At 60 seconds after arrival at the resuscitation trolley; 74 (70%) had a hat placed and 100 (93%) were in a PB. The median time to perform all tasks from the time of birth was greater than that recommended by the guidelines.

Conclusion: Initial steps to preserve heat in newly born very preterm infants now takes more time to perform than guidelines recommend. Neonatal resuscitation guidelines should consider that an increased time to CC impacts the time to initiation of thermal care.

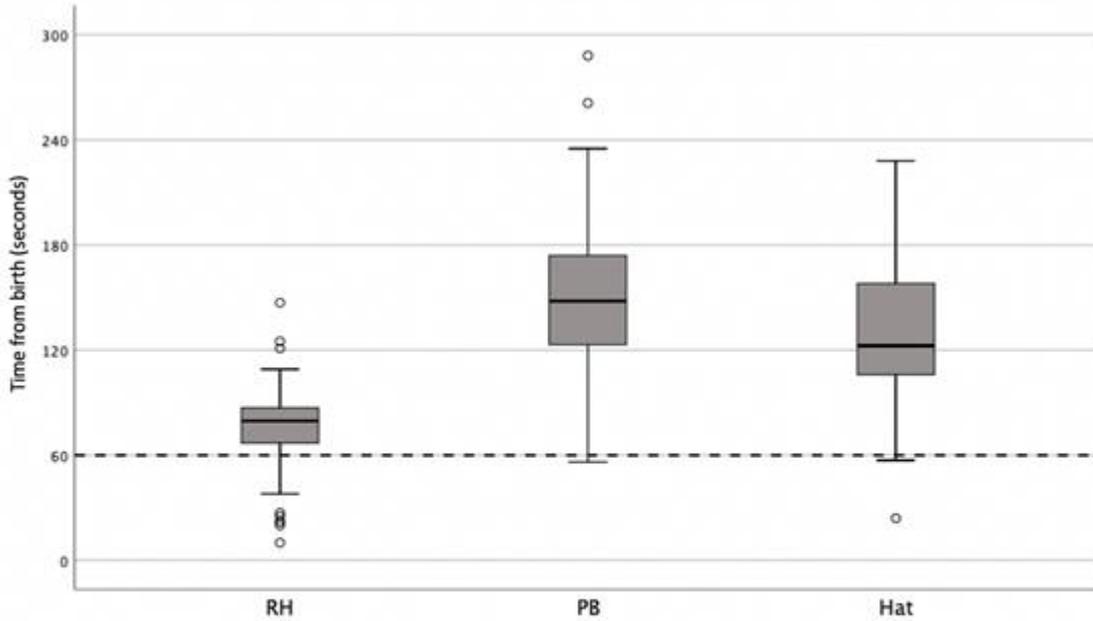


Figure 2: Boxplot showing median (IQR) and outliers for time to complete tasks. RH: placement under radiant heat. PB: Placement in a polyethylene bag. Hat: placement of a hat. The horizontal dashed line shows the recommended time of 60 seconds to complete the tasks.

Boxplot showing median (IQR) and outliers for time to complete tasks. RH: placement under radiant heat. PB: Placement in a polyethylene bag. Hat: placement of a hat. none declared



ID 364. THE ASSOCIATION BETWEEN ADMISSION TEMPERATURE AND ADVERSE OUTCOMES IN PREMATURE INFANTS WITH GESTATIONAL AGE LESS THAN 32 WEEKS: SYSTEMATIC REVIEW AND META-ANALYSIS

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Background:

Although it may sound simple and easy, to keep a newborn warm immediately after birth appears to be difficult and hypothermia occurs frequently. Occurrence of hypothermia, most often defined as a temperature <36°C, in the early postnatal period between 31 and 85% has been described. Preterm infants <32 weeks are especially vulnerable during this transition period in the first hours of their life. Hypothermia has been associated with adverse outcomes including hypoglycaemia, bronchopulmonary dysplasia, necrotising enterocolitis, intraventricular haemorrhage, and even death in some, but not all studies.

Methods:

A systematic review and meta-analysis was performed considering the association between admission hypothermia upon arrival at the NICU and adverse outcomes in premature infants born <32 weeks. Outcomes of interest were mortality and neonatal morbidities. A random effects analysis was performed.

Results:

After screening 7094 studies, 36 studies were analyzed full-text of which 18 studies were included in this review. In total n=63,170 infants were included, varying from 50 to 9833 between studies.

All but two studies reported on mortality, ten studies reported on IVH, seven on sepsis, eight studies reported on NEC, six on BPD and six studies on ROP. One study reported on the combined outcome of BPD/IRDS and mortality.

Mortality data for hypothermia compared to normothermia could be extracted for 12/18 studies (67%) (n=44,906). Hospital mortality was reported in five studies, early neonatal mortality in one study, both in one study and for five studies no definition of mortality was provided. Overall crude RR for mortality in the hypothermia group compared to normothermia was 1.85(1.66-2.06) (12 studies)(table1). The majority of studies which presented adjusted effect measures used birthweight, gender, antenatal corticosteroids and 5 minute Apgar score. Studies for which both crude and adjusted effect estimates were provided or could be calculated showed lower effect estimates after adjustments in all nine studies (table1). For crude RR for neonatal morbidities see table 1.

Conclusion:

Hypothermia is associated with mortality in preterm infants in both crude and adjusted analysis. The strength of this association may be influenced by confounders, definitions of hypothermia and exclusion criteria.

Outcome	RR	95%CI	No. of studies
Overall crude mortality	1.85	1.66;2.06	12



Crude mortality (hypothermia <36°C)	2.00	1.77;2.27	9
Crude mortality (hypothermia <36.5°C)	1.91	1.62;2.25	7
Pooled adjusted RR for mortality	1.22	1.08;1.38	2
Overall crude mortality OR	2.16	1.92;2.42	12
Pooled adjusted OR for mortality	1.53	1.4;1.68	7
Crude RR for NEC	1.15	0.93;1.42	6
Crude RR for IVH	1.24	1.08;1.43	7
Crude RR for BPD	1.12	0.97;1.29	6
Crude RR for sepsis	1.18	1.06;1.35	5
Crude RR for ROP	1.47	1.35;1.61	6

Table 1. Crude and adjusted Risk Ratio's for mortality and neonatal morbidities for admission hypothermia compared to normothermia
none declared



ID 280. FIXED PRESSURE DEVICES (T-PIECES) OR HAND DRIVEN PRESSURE DEVICES (BAGS) FOR RESUSCITATION AT BIRTH: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background

Initial management of inadequate adaptation to extrauterine life relies on non-invasive respiratory support. Two types of devices are commonly available: fixed pressure devices (FP; T-pieces or ventilators) and hand driven pressure devices (HDP; eg self-inflating bags). There is no consensus about benefices that each option offers. However, some studies reported a higher incidence of pneumothorax since T-piece utilisation.

Methods

A systematic review and meta-analysis was carried out. Medline, Embase, Scopus and Cochrane Library of Trials were searched. Randomised, quasi-randomised studies and prospective cohorts comparing the use of the two types of devices in neonatal resuscitation were included.

Results

Eight (8) studies recruiting 3571 newborns were included: 4 RCTs, 2 qRCTs and 2 prospective cohorts. Mortality was decreased in FP group (OR 0,57 95%CI(0,47-0,69) - NNT 12,5). Several respiratory outcomes were also improved: intubation in the delivery room (OR 0,55 (0,39-0,79) - NNT 7), mechanical ventilation (OR 0,58 (0,42-0,80) - NNT 7) and its duration (SMD -0,16 (-0,29- -0,03)), surfactant administration in premature infants (OR 0,67 (0,55-0,82) - NNT 30) and combined risk of mortality or bronchopulmonary dysplasia (RR 0,60 (0,50-0,71) - NNT 9). Decreases in mortality, intubation and mechanical ventilation rates remained when focusing on randomized studies (RR 0,62 (0,41-0,94), RR 0,61 (0,38-0,99) and RR 0,72 (0,53-0,98) respectively). Common morbidities of premature birth as patent ductus requiring treatment, intraventricular haemorrhage, retinopathy of premature and necrotizing enterocolitis were similar in the two groups. The risk of cystic periventricular leukomalacia decreased significantly with FP (OR 0,59 (0,41-0,85) - NNT 27). Finally, there wasn't any significant difference in pneumothorax rates between the two groups (OR 0,82 (0,44-1,52)).

Conclusion

Resuscitation at birth with fixed pressure devices increases its effectiveness, without increasing morbidity. Longer term benefits may include decreased mortality, mortality or bronchopulmonary dysplasia, and cystic periventricular leukomalacia.

Devices providing fixed pressures should therefore prevail for resuscitation at birth.

Other

No founding

Registration: PROSPERO 2020 CRD42020191685

None declared



ID 547. POSITIVE PRESSURE VENTILATION AT BIRTH USING A DISPOSABLE INFANT T-PIECE RESUSCITATOR (NEO-TEE®) VERSUS A SELF-INFLATING BAG – A RANDOMIZED-CONTROLLED MANNEQUIN STUDY

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BACKGROUND: Where resources permit, a T-Piece resuscitator is recommended over a self-inflating bag (SIB) to provide positive pressure ventilation (PPV) in neonates at birth. In low-resource environments (e.g., out of hospital), SIBs are frequently used for bag-valve-mask ventilation in cases of neonatal emergencies. A disposable infant T-Piece resuscitator (Neo-Tee®) is a relatively new and cost-effective device that may allow PPV at birth with all advantages of a T-Piece resuscitator even in low-resource environments and could potentially be used by emergency physicians or paramedics in out-of-hospital settings. Therefore, we investigated whether there are differences in paramedics' ventilation quality during simulated PPV in neonates by using Neo-Tee® compared to a SIB.

METHODS: Randomized-controlled mannequin study in 25 voluntary paramedics from the Austrian Red Cross were included. Prior participation, participants received training with both ventilation devices: i) disposable infant T-Piece resuscitator (Neo-Tee® Mercury Medical, Clearwater, Florida, U.S.A.) [default settings: positive inspiratory pressure (PIP) of 25cmH₂O, positive end-expiratory pressure (PEEP) of 5cmH₂O, gas flow of 8l/min] and ii) SIB (Ambu® Mark IV Baby, Ambu, Denmark) [PEEP valve at 5cmH₂O, pressure-limiting valve at 40cmH₂O, without manometer]. Participants were asked to deliver adequate PPV to a modified leak-free term manikin (GM Instruments, U.K.) via face mask for 60s with each device in a random order. PIP, PEEP, expiratory tidal volume (V_{Te}), mask leak, and ventilation rate were recorded using a respiratory function monitor (SMART Resuscitation Mask Leak Trainer, GM Instruments, U.K.).

RESULTS A total of 2,250 inflations were analyzed. The Neo-Tee® compared to the SIB resulted in a mean (SD) PIP and PEEP of 22.2(16.0) versus 32.4(11.7) cmH₂O (p<0.001) and 2.7(0.8) versus 3.9(1.5) cmH₂O (p=0.001), respectively. V_{Te} was higher with the Neo-Tee® with 40.8(13.3) versus 29.7(8.9) mL with the SIB (p=0.001). Mask leak was lower with the Neo-Tee® compared to the SIB with 16(24) versus 42(26)% (p<0.001), while ventilation rate was similar with 43(11) versus 39(10)min⁻¹ (p=0.032).

CONCLUSION: During simulated PPV in neonates with Neo-Tee® delivered by paramedics, we found significantly lower PIP and significantly reduced mask leak, while V_{Te} was significantly higher compared to bag-valve-mask ventilation. These findings suggest paramedics' PPV with Neo-Tee® is feasible and warrants studies in human patients.

None declared