ID: 165
TITLE: HIGH-CPAP INCREASES THE DEGREE OF LUNG AERATION IN PRETERM RABBITS AT BIRTH
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CONTENT:

Preterm infants require continuous positive airway pressure (CPAP) at birth to adequately aerate their lungs. CPAP of 5-8 cmH2O is recommended, yet the optimal strategy is unknown. Higher CPAP levels may initially increase surface area which is essential for gas exchange but may cause overdistension after lung aeration. The role of CPAP then changes into preventing alveolar collapse and re-entry of lung liquid for which a lower CPAP level may be adequate. A dynamic strategy based on the transitional phases of lung may be more beneficial in aerating the lungs and support breathing. The aim was to investigate the effect of CPAP strategies on respiratory function and lung aeration at birth.

Preterm rabbit pups (29 days gestation; term ~32 days) were delivered via caesarean section and received 0 (n=7), 5 (n=6), 8 (n=7), 12 (n=8), 15 (n=5) cmH2O CPAP continuously. Two additional groups started at 15 cmH2O which was titrated to 5 (n=6) or 8 (n=6) cmH2O CPAP after stabilization. Functional residual capacity (FRC; lung aeration) was measured using phase contrast X-ray imaging. The study was conducted in the experimental hutch 3 of beamline 20B2 in the Biomedical Imaging Centre at the Spring-8 synchrotron. The study period ended after 10 minutes after starting CPAP or when intermittent positive pressure ventilation (iPPV) was initiated.

High-CPAP strategies (> 8 cmH2O) led to a higher FRC at 3-4 and 9-10 minutes after birth when compared to standard-CPAP strategies (5-8 cmH2O). (Figure 1) In the dynamic CPAP groups, CPAP was titrated after 4.15±1.39 minutes. Titration to 5 or 8 cmH2O CPAP led to a change in FRC of -3.5±12.1 versus 0.0±2.6 mL/kg (p=0.589). (Figure 1) Breathing rate was higher in the high-CPAP group at 3-4 minutes but was similar between groups at 9-10 minutes. Pups receiving standard-CPAP strategies needed non-significantly more and sooner PPV (p=0.697). In the dynamic groups iPPV was started after titration. During the experiment, only one pup needed iPPV while being supported on 15 cmH2O CPAP. Values were excluded after iPPV was started, reducing the differences between groups regarding FRC and breathing rate at minute 9-10. After iPPV pups (n=8) gained 16.9±3.3 mL/kg FRC.

Preterm rabbits supported with high-CPAP strategies established better lung aeration. Titration to 8 cmH2O CPAP maintained the degree of lung aeration. Pups receiving standard-CPAP strategies needed non-significantly more and sooner iPPV. Pups gained FRC after iPPV.

IMAGES:

https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=72c34aa7243e4667cbb11d3e7b92d34c-MjAxOS0wNSM1Y2UyNjY2YmU2M2Zi

Figure 1: Functional residual capacity

COI: None declared
ID: 527
TITLE: DOES THE USE OF DEFERRED CONSENT AFFECT RECRUITMENT, PARTICIPANT CHARACTERISTICS, AND OUTCOMES WITHIN A NEONATAL RESUSCITATION TRIAL?
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CONTENT:
Neonatal trials that rely on antenatal consent risk selection bias by excluding those in whom it was not possible to obtain antenatal consent. Waiver of prospective consent, followed by deferred (retrospective) consent, is controversial in neonatal trials, but has been found to increase the proportion of eligible infants recruited, and to enrol infants with different risk factors from those recruited using prospective, antenatal consent. We evaluated the effects of the addition of deferred consent in a large delivery room randomised trial comparing two resuscitation techniques on the proportion of infants recruited, their baseline characteristics, and the outcomes between groups.
A secondary analysis of the 426 infants born at 23-26 weeks’ gestation who were enrolled in the Sustained Aeration of Infant Lungs (SAIL) Trial. SAIL compared the use of sustained inflations at birth, with standard resuscitation. In SAIL, 6/21 recruiting centres used deferred consent (DEF) in addition to (n=4), or in place of (n=2) prospective antenatal consent (PRO). We compared infant data from centres where DEF was available, versus those where it was not. Using Chi squared, Fisher’s exact, or Mann-Whitney U-tests as appropriate, we compared proportions of eligible infants recruited, baseline characteristics, and SAIL outcomes (primary outcome of death or bronchopulmonary dysplasia (BPD) at 36 weeks, these two individual components, and secondary outcomes prior to hospital discharge).
Fifteen centres used PRO consent only: 197 of 473 eligible infants were randomised; 42%. Six centres used/included DEF consent; 286 of 315 were eligible and randomised (84%), 229 of 315 consented (73%); absolute difference: 31%, 95% confidence interval (CI): 24.4%, 37.7%; p<0.001. In centres using DEF, mothers were older, more likely to be Caucasian, less likely to have chorioamnionitis, less likely to have had a full course of antenatal corticosteroids (73 vs. 84%, p=0.005), and more likely to have a vaginal birth (45 vs. 27%, p<0.001). Infants enrolled at centres using DEF were more likely to be male, were heavier, less likely to be growth restricted, and less likely to be intubated at birth. There was an 8% difference in death/BPD between groups; DEF 65% vs. PRO 57%; risk difference 7.7, CI -1.6%, 17.0%; p=0.10. Primary components and secondary outcomes are shown in the table.
A higher proportion of eligible infants was recruited when deferred consent was available. Baseline differences included less exposure to antenatal corticosteroids; outcome differences included higher risk of NEC and any IVH, and less risk of any ROP, in the deferred consent group. These data suggest that a study sample recruited using only antenatal consent may select a population not representative of those to whom the results will be applied.

IMAGES:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=c3f20bda33ed0f372a78d684db37d9e2-MjAxOS0wNSM1Y2UyNjY2YzgyMDI1

Components of primary outcome and secondary outcomes

COI: none declared