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EFFECT OF A 3-HOUR FAST FOR BREAST MILK ON GASTRIC RESIDUAL VOLUME AND PH

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Introduction

In the event of pulmonary aspiration of breast milk, aspirate volumes greater than 0.8ml/kg appear to be most harmful, with mortality exceeding 50% in animal studies (1). Breast milk curdles on contact with gastric acid, and tracheal aspiration of particulate matter combined with acidic pH has a synergistic effect on lung injury (2).

Gastric emptying in premature babies has been extensively studied using ultrasound (USS), to optimise feeding regimens for growth. Measurements of antral cross-sectional area (ACSA) return to baseline within 150 minutes of feeding (3). A predictive model for estimation of gastric residual volume (GRV) using ACSA has been proposed for children under 12 months of age, derived from children subjected to a mean 8h fast (4).

Methods

Following ethical approval and clinicaltrials.gov registration (NCT05355428) we are carrying out a prospective interventional cohort study. Children complete their final breast feed 3 hours prior to the expected GA induction time. A gastric USS is performed in the supine and right lateral decubitus positions using a Sonosite linear probe, using previously described methodology. Inbuilt software within the USS converts measured circumference to ACSA, and this is recorded prior to induction. Using the formula proposed by Kim et al, predicted GRV is calculated. If predicted GRV is > 0.8 ml/kg then anaesthesia is either postponed or the induction technique altered, at the discretion of the attending anaesthetist. Following induction, GRV is measured using a nasogastric tube in supine and right lateral decubitus (RLD) positions. Predicted and actual GRV are then correlated. A sample size of 31.3 was calculated to have 90% power at a significance level of 0.05. This was increased to 35 to allow for 10% dropout.

Results

Currently, 12 of the planned 35 infants have been enrolled. The median corrected gestational age is 10.2 (IQR 2.2-14.0) months and median weight 7.9 (IQR 4.4-10.0) kg. Preliminary results show a median fast time of 3 hours and a median GRV on gastric aspiration of 0 (IQR 0–0.09) ml/kg. All views of gastric antrums were graded 0 (empty). Median USS measured values for ACSA were 0.92 (IQR 0.7-1.2) cm2 supine and 1.02 (IQR 0.87-1.5) cm2 in RLD. For one patient the predicted GRV was > 0.8ml/kg. The

anaesthetic induction technique was altered to an intravenous induction.There were no adverse events.

Discussion and conclusion

Current data suggests that GRV following a 3 hour fast after breast milk is extremely low. USS measurements appear to predict a higher value for GRV than is present. We hope that by completing the study we will add to the evidence base for a shortened breast milk fasting time.

References

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