Nutrition and Adverse Respiratory Outcomes in Extremely Prematurely-born Infants

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Aims: Extremely premature infants commonly require invasive mechanical ventilation from birth. Such infants have low nutritional reserves and high metabolic demands which can make optimisation of nutritional support challenging. We hypothesised that quantified growth indices would be negatively associated with days of invasive ventilation as a surrogate index of respiratory disease severity.

Methods: Electronic records of infants born less than 28 completed weeks of gestation between 1/1/2012 and 1/12/2016 and solely cared for at King’s College Hospital were retrospectively reviewed. Gender, gestational age, postmenstrual age at discharge and duration of invasive mechanical ventilation were collected. Infants who were mechanically ventilated for less than one week and those who died in the neonatal period were excluded from analysis. The difference in weight z-score from birth to discharge (ΔWz) and the difference in head circumference z-score from birth to discharge (ΔHz) were calculated using the UK-WHO preterm reference charts.

Results: Fifty-five infants (28 male) were included with a mean (SD) gestational age at birth of 25.6 (1.3) weeks, birth weight 0.74 (0.15) kg, weight at discharge 3.62 (1.28) kg and postmenstrual age at discharge 46.4 (9.1) weeks. Twenty-nine infants (52.7%) received a full course of antenatal steroids; only 6 (10.9%) received no antenatal steroids. Birth weight z-score was -0.66 (0.84), head circumference z-score -0.24 (2.07) and the median (IQR) duration of mechanical ventilation was 45 (33-68) days. The median (IQR) ΔWz was -1.21 (-1.79 – -0.39) and ΔHz was -0.72 (-1.42 - 0.61). Both ΔWz and ΔHz were significantly related to the number of ventilation days (r=-0.345, p=0.01; r=-0.508, p=0.03 respectively).

Conclusions: Poor postnatal growth of extremely premature infants in our cohort was significantly associated prolonged ventilation. These results suggest further work is needed to optimise the nutritional intake of those extremely premature infants.