Background and aims Insulin is frequently required to treat hyperglycemia that increases both mortality and morbidity in ELBW infants. Adult and animal studies suggest a link between hypophosphatemia and insulin resistance. Our objective was to define whether hypophosphatemia increases the risk of insulin requirement in ELBW infants.

Methods This observational study included ELBW infants admitted to our NICU between 01.01.2010 and 31.12.2011 who survived until DOL14. Laboratory and clinical data were retrospectively collected. According to the NICU policy, phosphatemia was measured before DOL3 and glycaemia was checked daily during parenteral nutrition. Insulin was introduced in case of refractory hyperglycemia >11 mmol/l. Depending on the lowest phosphatemia before DOL3, patients were divided into hypophosphatemic (HP, < 1.2 mmol/l) and controls (≥1.2 mmol/l). Uni- and multivariable analysis compared the time to insulin requirement using survival models.

Results In all, 126 patients were included: 39 HP, 87 controls. Mean(SD) gestational age was 27.8 (1.5) in HP and 27.4 (1.5) weeks in controls, birthweight was 770 (140) and 837 (109) grams. Insulin was required in 19/39 (49%) HP and 26/87 (30%) controls with a delay of 17 (10) and 22 (9) days respectively. The unadjusted hazard ratio of insulin requirement in HP was 1.93 (95% CI: 1.07–3.49, p=0.03). After adjustment for gestational age, birthweight, sex, IUGR and sepsis, the hazard ratio was still 1.6 (95% CI: 0.86–3.17) but not significant (p=0.13).

Conclusion Hypophosphatemia may be a risk factor for insulin requirement in ELBW. Multivariable analysis shows that age and birthweight could also influence this outcome. Whether aggressive management of hypophosphatemia can improve glycaemia control deserves to be studied.

Background and aims Meta-analysis of randomised trials (RCTs) demonstrated that volume-targeted ventilation (VTV) in comparison to pressure-limited ventilation (IPPF) reduces BPD/death, pneumothorax, hypocarbia and PVL grade 3–4 IVH in prematurely born infants. Certain RCTs, however, employed different ventilators in the two arms and, overall, a range of VT levels were used. Our aim was to undertake an RCT in prematurely born infants with acute respiratory distress comparing IPPV with VTV, using a VT level of 5ml/kg, which has been shown to reduce the work of breathing.

Methods Infants < 34 weeks of gestational age and < 24 hours of age were recruited. The primary outcome was the time taken to achieve pre-specified weaning criteria. Secondary outcomes included the occurrence of PDA, pneumothorax, IVH, PVL and hypopcarbia; hypopcarbia was defined as a PaCO₂ of < 4.5 kPa on any blood gas in the first 72 hours after birth. Infants met failure criteria if they required HFO, peak pressures >45 cm H₂O or had a pulmonary haemorrhage. Analysis was by intention-to-treat.

Results The planned sample size of 40 infants was achieved, with no significant differences in the two groups' demographics. The time taken to achieve weaning criteria was similar in the two groups (14 hours [VTV] versus 23 hours [IPPF]; hazard ratio=0.82 (95% CI 0.42, 1.58), p=0.55. Five “VTV” and three “IPPF” infants met failure criteria, p=0.69. Fewer “VTV” than “IPPV” infants had hypopcarbia (5 versus 19), p<0.001.

Conclusion VTV was associated with a significantly lower incidence of hypocarbia.