Background and Aims Premature neonates commonly receive red blood cell (RBC) transfusions. Our aim was to systematically review the randomised controlled trial (RCT) evidence for use of RBC transfusions.

Methods We identified RCTs where the intervention was ‘transfusion of red blood cells’ from searches of multiple databases. Two reviewers independently extracted data and assigned overall quality. The primary review outcomes were mortality, and neurodevelopmental and respiratory endpoints.

Results We identified 27 RCTs; three studies compared RBC transfusion versus no transfusion/placebo, four compared transfusions of differing doses or administration schedule, 14 compared different types or products of RBC and six compared different thresholds for transfusion. Within the group of product trials, the largest subgroup of seven RCTs evaluated different media for storage or dilution of red cells, enrolling a total of 221 neonates. In the threshold group of six trials, enrolling 679 neonates, no significant differences in mortality (RR 1.22, 95% CI 0.84–1.75) or chronic lung disease (RR 0.99, 95% CI 0.84–1.15) were found; Only one RCT assessed neurodevelopment at 2 years and reported no difference. Many trials failed to report on clinical outcomes including mortality, chronic lung disease or other major neonatal co-morbidities, which would be considered of importance to clinicians.

Conclusions There are a large number of RCTs of RBC transfusions in this high risk population. Despite this, areas of concern included the nature of the intervention, outcome measures, sample size and quality of the trials, which precluded clear recommendations on the safety and role of RBC transfusion.

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Background and Aims Previous studies showed that the switchover from fetal (HbF) to adult (HbA) haemoglobin occurs in relation to postmenstrual age (PMA).

Aims To assess HbF levels at 36 weeks PMA in preterm infants born between 24 and 31 completed weeks, to determine their association with bronchopulmonary dysplasia (BPD), sepsis and packed-red-blood-cells (PRBC) transfusions.

Methods A retrospective cohort study of 130 preterm infants was performed. HbF determinations were obtained from the routine capillary blood gases using ABL-800-flex (Radiometer Copenhagen) and results were reported as percentage of total Hb. Associations of HbF level and its related factors will help better understanding of oxygen transport in selected complications of prematurity.

Results Infants were born between 24 and 31 completed weeks (range 24–31.5 weeks), with a mean birth weight of 995 g (range 380–1965 g); 45 of them (54.6%) had BPD, 36 (27.7%) were affected by sepsis and 76 (58.5%) received PRBC-transfusions (mean transfusion rate 2.5). At the univariate analysis HbF was significantly lower in infants with BPD (54.3±21.2% vs 62.9±18%, p=0.03), in those with sepsis (49±18.7% vs 68±18.6%, p<0.001) and in infants who received PRBC-transfusions (48.8%±14.6% vs 74.6±17.2%, p<0.001). By multiple regression analysis, lower HbF levels were significantly associated to greater number of transfusions (p<0.001), previous occurrence of sepsis (p=0.01) and BPD (p=0.05).

Conclusions PRBC-transfusions, sepsis and BPD are associated with lower HbF levels at 36 weeks PMA. Information on postnatal changes of HbF level and its related factors will help better understanding of oxygen transport in selected complications of prematurity.