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% C.I 0.84–1.75) or chronic lung disease (RR 0.99, 95% C.I 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.

258 FETAL HAEMOGLOBIN LEVELS IN PRETERM INFANTS AT 36 WEEKS POSTMENSTRUAL AGE: EFFECT OF BRONCHOPULMONARY DYSPLASIA, SEPSIS AND TRANSFUSIONS

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Background and Aims Previous studies showed that 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 gasses using ABL-800-flex (Radiometer Copenhagen) and results were reported as percentage of total Hb. Associations of HbF levels and clinical variables were tested by t-test and multiple regression analysis.

Results Infants were born at a mean gestational age of 28.1 weeks (range 24–31.5 weeks), with a mean birth weight of 995 g (range 380–1965 g); 45 of them (34.6%) 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 63%±18.6%; $p=0.002$) 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.

259 FROZEN PLASMA AND CRYOPRECIPITATE TRANSFUSION PRACTICES AMONG NEONATOLOGISTS - A NATIONAL SURVEY

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Background Frozen Plasma (FP) and cryoprecipitate (Cryo) are frequently transfused to neonates although indications remain unclear. This survey aimed to characterize current UK neonatal FFP/Cryo transfusion practices.

Methods Pre-piloted 15 question survey developed by neonatologists and transfusion medicine specialists in UK, to include clinical scenarios and direct questions about FP/Cryo transfusion decisions. Survey was posted to all neonatal units ($n=200$ UK).

Results Response rate for UK was 53%, 42% Level 2, 25% level 3 and 12% level 1 units. 48% of clinicians, would consider using FP for volume expansion in a non-bleeding, non-coagulopathic infant with hypotension refractory to inotropes and crystalloids. In a clinical vignette describing the same case scenario, 11% of clinicians would use FP to raise oncotic pressure. 19% of neonatologists would use FP as an adjunct to diuresis in an infant with oedema, when other interventions failed, 5% of clinicians would order FP. For isolated abnormal haemostatic test results in the absence of bleeding, 21% of clinicians would give FP (irrespective of laboratory results), while 66% would order FP for clinical bleeding in the absence of coagulation results. When asked about volume of FP administered, 51% responded 10mls/kg, and 43% 15–20mls/kg. With respect to cryoprecipitate, 26% of respondents did not use this product.

Conclusions FP practice including dose is highly variable. Neonatologists are considering use of FP to expand volume and raise oncotic pressure. There is limited consideration of Cryo for transfusion. This survey highlights areas where evidence and education are essential to improve practice.

260 A SINGLE CENTRE RETROSPECTIVE STUDY OF CYTOGENETIC PROFILE, MANAGEMENT AND OUTCOME OF ACUTE MYELOID LEUKAEMIA IN CHILDREN

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Background and Aims AML15 was the first major trial to compare anthracycline based consolidation to a Cytosine-Arabinoside based one. Following closure of the trial, standard therapy of cytosine - arabinoside consolidation therapy is currently recommended at this centre. A review of the cytogenetic, treatment and outcome profiles for patients diagnosed with Acute Myeloid Leukaemia was undertaken following concerns regarding relapse rates.

Methods A retrospective study was conducted at the Royal Marsden Hospital on children (aged less than 18), diagnosed to have acute Myeloid Leukaemia between January 2004 and June 2011.

Results A total of 72 patients were identified, of which 7 patients did not achieve remission following induction chemotherapy with ADE. 48 patients were appropriate for comparison, 22 patients

received treatment with cytosine - arabinoside (ara-C) based consolidation and 26 patients received treatment with anthracycline based therapy (MACE/MIDAC). 9 patients (41%) in the araC group relapsed and 3 of these patients subsequently died. In only 1 patient this was secondary to resistant disease. Of the 9 patients who relapsed 6 had adverse cytogenetics. Within the group of patients treated with MACE/MIDAC consolidation, 14 relapsed (54%) and of these, 10 patients subsequently died. 6 of the 14 relapsed patients had adverse cytogenetic profiles. No patient within the MACE/MIDAC group had treatment changed due to cardiotoxicity. Chi-squared analysis of death rates identified a *p* value < 0.1, but more than 0.05.

Conclusions The outcome analysis indicates that there is no significant difference between rates of relapse or death in the 2 groups of patients.

261 TEN-YEAR FOLLOW-UP OF INFANTS WITH SYMPTOMATIC AND ASYMPTOMATIC CONGENITAL CYTOMEGALOVIRUS INFECTION

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Background and Aims Congenital Cytomegalovirus (CMV) infection can lead to neurological sequelae and sensorineural hearing loss (SNHL). To correlate clinical, auditory and neuroimaging findings in the neonatal period to long-term outcome in congenitally CMV-infected infants.

Methods Congenitally CMV-infected infants born between 2001 and 2011 were clinically evaluated and underwent cranial Ultrasound (cUS), cerebral Magnetic Resonance Imaging (cMRI), funduscopy examination and auditory brainstem response (BAER) in the neonatal period. Both symptomatic and asymptomatic infants were followed prospectively to assess physical growth, neurological, visual and audiological outcome.

Results Forty-two infants were evaluated. Six of 42 (14.2%) infants had symptoms/signs at birth: microcephaly (3), petechiae (4), thrombocytopenia (3), hepatosplenomegaly (3), jaundice (1), elevated serum transaminases (1). Two cases of chorioretinitis and 4 cases of abnormal BAER were found in the neonatal period. cUS demonstrated pathological findings in 6/42 (14.2%) infants: ventriculomegaly (4), pseudocysts (3), calcifications (3), cerebellar hypoplasia (1). cMRI showed abnormalities in 10/42 (23.8%) infants: pseudocysts (3), white-matter lesions (7), lissencephaly (1), ventriculomegaly (4), calcifications (2), cerebellar hypoplasia (2). At follow-up (mean duration 43±18 months) 8/42 (19%) infants showed SNHL and 8/42 (19%) showed impaired psychomotor development. The composite outcome (SNHL and/or neurodevelopmental sequelae) was poor in 9/42 (21.4%) infants. Neonatal findings in infants with an adverse outcome were: clinical signs (5/9), abnormal BAER (2/9), abnormal cUS (5/9), abnormal cMRI (9/9). Symptomatic infants received antiviral treatment.

Conclusions In our series 21.4% of congenital CMV infected infants had one or more sequelae at follow-up evaluations. A pathological neuroimaging at birth was the most sensitive predictor of long-term sequelae.

262 WHETHER MULTI-RESISTANT STRAINS OF NON-TYPHOID SALMONELLOSIS AFFECT CLINICAL MANIFESTATIONS AND OUTCOMES IN CHILDREN?

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Objective The aim of the study was to investigate whether multi-resistant strains of non-typhoid salmonellosis affect clinical manifestations and outcomes in children.

Methods Between 1996 and 2009, children with nontyphoid salmonellosis admitted to Kaohsiung Veterans General Hospital, Taiwan were enrolled. An organism was considered multi-resistant if resistant to ≥2 agents. Fecal excretion time was defined as the time-frame of the first positive stool culture and the first of two consecutive negative results. The demographic, laboratory data and clinical outcomes were compared between the patients infected with non-typhoid *Salmonella* susceptible to all antibiotics (susceptible group) and those infected with multi-resistant strains (resistant group).

Results 764 patients were enrolled; 318 were characterized as the susceptible group; 329 were the resistant group. Compared with susceptible group, the patients of resistant group were younger (32.36 vs 23.65 months of age); demonstrated significantly more bloody stool; higher white blood cells; longer total fever days and hospital stay (38.4% vs 49.2%; 9,538 vs 10,205/Cumm; 5.75 vs 6.66 days; 8.38 vs 9.49 days, respectively). However, there were no statistically significant differences in C-reactive protein (7.74 vs 7.82 mg/dl), occurrence of bacteremia (15.04% vs 14.57%), rates of antibiotics used (67.30% vs 70.21%), complications (3.77% vs 2.43%) and fecal excretion time [19.25 (N=20) vs 11.69 (N=16) days].

Conclusion The children with multi-resistant non-typhoid salmonellosis had more severe clinical manifestations and worse outcomes in terms of bloody stool, leukocytosis, fever days and hospital stay. Antibiotics use in humans and animals should be weighed against the development of resistance.

263 RSV HOSPITALIZATION IN CYSTIC FIBROSIS IN THE CANADIAN REGISTRY OF SYNAGIS® (CARESS) FOLLOWING PROPHYLAXIS (2005–2011)

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Background and Aims The Canadian Registry of Synagis® (CARESS) tracks palivizumab utilization and respiratory syncytial virus (RSV) hospitalizations in high-risk infants including 186 with cystic fibrosis (CF). This study compares respiratory illness (RI) and RSV positive hospitalization (RSVH) rates in CF infants versus:

1. those with other underlying medical disorders (MD) and
2. those who meet standard indications for RSV prophylaxis (SD).

Methods A prospective, observational registry of infants from 30 sites who received ≥1 dose of palivizumab during the 2005–2011 RSV seasons. Palivizumab utilization and RI outcomes were collected monthly over each individual season.

Results 10,452 infants were enrolled (CF: 186, 1.8%; MD: 1378, 13.2%; SD: 8888, 85.0%). There were significant differences (*p*<0.05) between the three groups in gestational and enrolment ages, weight at birth and at enrolment and proportions of: Caucasians, siblings, multiple births, daycare attendance, smokers in the household, >5 people in the household, immediate family history of atopy, and complexity of neonatal course. Infants with CF had a lower RI hospitalization rate than the MD (4.3% versus 11.0%, *p*=0.003) but not the SD group (5.8%, *p*=0.522). For RSVH rate, CF infants were not significantly different from the MD (0.72% versus 2.46%, *p*=0.227)