Conclusion We have established an in vitro study of the cystine heterodimer rBAT/$b^{0,+}$AT in human PTC which can be used to investigate known and discovered cystinuria mutations, and ultimately facilitate development of novel therapies for this disease.

G47 INVESTIGATING NEW BIOMARKERS FOR EARLY DETECTION OF ACUTE KIDNEY INJURY IN PAEDIATRIC INTENSIVE CARE

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Critically ill children and neonates admitted to Intensive Care are at high risk of developing acute kidney injury (AKI) and do so early in the course of their illness. AKI is associated with increased duration of stay in intensive care, short and long term renal impairment, increased mortality, and increased hospital costs. AKI is currently diagnosed when serum creatinine (SCr) levels rise, however there may be a 48 hour delay between renal insult and detectable increase in SCr levels. This can delay diagnosis of AKI and hence potential intervention to mitigate renal damage. New AKI biomarkers can aid early diagnosis in patient groups where there is a timed potential renal insult (eg: cardiac surgery), however their utility has not been assessed in a mixed patient cohort.

We conducted a pilot study for all admissions to PICU at the Royal Manchester Children's Hospital over a 6 month period to identify risk factors for developing AKI and to measure the correlations between SCr and new AKI biomarkers. We defined AKI as eGFR <100 ml/min/1.73m^2 (Schwartz formula calculation). We collected urine and plasma from 50 children (age 16 days-15 years, 46% male) for the measurement of Cystatin C, KIM-1 and NGAL. We observed a 30% incidence of AKI in this cohort and age <12 months was a significant risk factor for AKI. New biomarker analysis correlated with SCr in 93% of cases and preceeded the rise by 24–48 hours in 20% of patients. The utility of new biomarkers for early detection was limited by the presence of AKI at study entry.

This investigation demonstrates feasibility of new AKI biomarker testing and in combination with risk stratification, could identify children who need to be protected from secondary renal injury during their inpatient admission.

G48 OUTCOME OF ACUTE KIDNEY INJURY MANAGED IN A REGIONAL PAEDIATRIC TERTIARY NEPHROLOGY CENTRE

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Introduction Acute kidney injury (AKI), characterised by acute decline in renal function is associated with significant morbidity and mortality in children. This study reviewed the aetiology, treatment modalities and outcome of children with AKI managed in the paediatric nephrology unit at the University hospital of Wales, Cardiff.

Method Retrospective analysis of referral practises, aetiology, and management of 38 children with AKI over the last 5 years. Outcomes noted as complete recovery, residual renal injury, renal replacement therapy (RRT) dependency or death. Children primarily treated in intensive care were excluded.

Result 34% of the total 38 patients were under 5 years of age. Haemolytic uraemic syndrome (HUS) was the commonest cause of AKI 18/38 (47.3%) with E coli 0157 accounting for most (15/18). Significant number of these cases required dialysis (10/15). 3 children had atypical HUS, one secondary to pneumococcal infection and other 2 with no known cause despite thorough workup. Obstructive renal failure (5 cases) was second most common and renal function improved following relief of obstruction. Overall, supportive management sufficed in 23/38 cases and 15 received renal replacement therapy (RRT). Most children on dialysis were oliguric (14/15). Peritoneal dialysis was the commonest mode of RRT used. 2 children needed plasma exchange. Outcome was equally favourable irrespective of mode of RRT. At 3 months there were no deaths; 29 (76%) had completely recovered, 5 children had estimated glomerular filtration rate (eGFR) between 40- 60 ml/min/1.73m^2, 2 had mild to moderate proteinuria and one was hypertensive. One child who remained dialysis dependant with moderate hypertension and proteinuria needed renal transplantation 2 years later. On most recent follow up eGFR had normalised in 2 and improved, between 70–75 ml/min/1.73m^2 in other 3 children. Proteinuria had resolved in one but persisted in the other.

Discussion Prognosis following AKI was excellent in children not needing intensive care probably because of lack of multiorgan dysfunction. HUS was the commonest cause of AKI. AKIs with oliguria are more likely to require dialysis and should be referred early to the nephrology team**.** All cases should have long-term follow up to ensure renal recovery and detect delayed complications.

G49 RESILIENCE, POST-TRAUMATIC STRESS, BURNOUT AND COPING IN MEDICAL STAFF ON THE PAEDIATRIC AND NEONATAL INTENSIVE CARE UNIT (P/NICU) – A SURVEY

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Aims Working on intensive care (ICU) can be stressful, Adult-ICU studies demonstrate staff burnout and post-traumatic stress disorder, (PTSD) although *resilience* is associated with a healthier psychological state in ICU nurses. This study aims to determine whether resilience is related to the prevalence of burnout and PTSD symptoms in PICU/NICU staff, and to establish any differences in coping strategies with varying levels of resilience.

Methods Workplace questionnaire: demographic data, questions on coping strategies and extracts: (1) ***Brief Resilience Scale*** 6 items scored on a 5-point scale, higher scores indicate greater resilience) (2) ***Trauma Screening Questionnaire*** 10 statements answered 'yes' or 'no'. Score of > 6 predicts PTSD (3) ***abbreviated Maslach Burnout Inventory*** – 3 separate subscales: Emotional Exhaustion (EE) = reduced energy and job enthusiasm, Depersonalization (DP) = cynicism, treatment of patients as inanimate, Personal Accomplishment (PA) = Sense of efficacy and effectiveness.

Results 58 respondents (50 female) 32 nurses, 22 doctors, 4 other HCPs. Years qualified: Range 0–32; P/NICU experience: Range 0–28 years.

Mean score for resilience = 3.58 (1.83 –5) 1 = lowest level of resilience and 5 = highest.

Mean burnout measure: **PA = 12.5, DP = 2.6 and EE = 8.0** (Scale 'felt this way' 0 = never to 18 = everyday).

All staff admitted to symptoms of emotional exhaustion on some level, 22 experienced some depersonalization. Scores for personal achievement ranged from 2–18.

Higher resilience levels were significantly associated with lower PTSD symptoms (r = –0.41, p = 0.001).

10 HCPs met criteria suggestive of PTSD, 38 had lower but concerning scores.