The commonest abnormality on MCUG was VUR. There was one case each diagnosed to have bladder diverticulum, ureterocele, pelvic kidney and duplex.

For the children who were diagnosed to have VUR, grading was documented in all cases while the timing of reflux was documented only in 20% of cases. Comment on duplex was made in 8% and no comment was made on ectopic ureter. In 20% of the cases, contrast draining from the upper tract was reported.

Conclusion Our study demonstrated that every report had a comment about the presence or absence of VUR and about further grading if abnormal. None of the reports mentioned the volume of contrast instilled into the bladder. There was variation in the frequency of reporting parameters on bladder outline, bladder emptying, post-void RV and urethra. There were a very limited number of children who had a voiding view without a catheter being taken.

A structured proforma for reporting MCUG to document basic information and comment on additional information if any abnormality is found will standardise the report and help in making decisions in managing these children.

### URINE PROTEIN ARRAY ANALYSIS TO IDENTIFY KEY INFLAMMATORY MARKERS IN CHILDREN WITH IGA VASCULITIS NEPHRITIS

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**Aims** Chronic kidney disease is a recognised complication of Immunoglobulin A Vasculitis (IgAV; previously Henoch Schonlein Purpura, HSP). The exact pathophysiology of this disease and the reasons why some patients develop significant renal involvement remain largely unknown (1). Identifying urinary inflammatory markers could aid identification of targets for earlier diagnosis and/or treatment.

The aim of this exploratory study was to perform a large protein array analysis to identify key urinary markers of kidney inflammation in children with IgAV nephritis (IgAVN).

**Methods** Paediatric patients with IgAV and healthy controls (HC) were recruited as part of the IgA Vasculitis Study (Alder Hey Children’s NHS Foundation Trust, Liverpool, REC 17/NE/0390). Patients with a diagnosis of IgAV were grouped into those with nephritis (IgAVN) and those without (IgAVwoN). Nephritis was defined as a urinary albumin to creatinine ratio (UACR) >30 mg/mmol with a renal biopsy demonstrating IgAVN. Determination of the relative levels of 124 key proteins (encompassing inflammatory cytokines and known markers of kidney inflammation) was performed using commercially available proteome profiler array kits (Human known markers of kidney inflammation) was performed using MetaboAnalyst 5.0 and VolcaNoseR online platforms.

**Results** 12 children were included in this study (IgAVN n=4, IgAVwoN n=4, HC n=4). Median age was 7.6 years [4.0-13.44] and male:female ratio was 1:1. For IgAVN, median UACR was 542.2mg/mmol [110.4-2,357.37]. 20 proteins were significantly upregulated (p < 0.05) in nephritis patients compared to those without (figure 1). The largest fold-changes (FC) were reported for B-cell depleting factor (BAFF, FC 9.7), Cripto-1 (FC=7.8), sex-hormone binding globulin (SHBG, FC=7.6) and Angiotensigen (FC=6.5). Urinary levels of complement components C5/C5a (FC=4.6) and Factor D (FC=2.6) were also significantly elevated in IgAVN compared to IgAVwoN. A total of 69 proteins were significantly upregulated in comparisons made between IgAVN v HC and 9 proteins in IgAVwoN v HC respectively.

**Abstract 642 Figure 1**

**Conclusion** This study has identified key urinary proteins providing new insight into the pathophysiology of IgAVN. Further longitudinal studies are needed to quantitatively analyse these biomarkers in a larger cohort.

**REFERENCE**


### IDENTIFYING PHENOTYPIC FEATURES TO INFORM GENETIC SCREENING IN CHILDREN WITH PERSISTENT HAEMATURIA

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**Aims** Persistent incidentally detected haematuria is prevalent in paediatrics and is commonly referred to paediatric nephrologists. It is important to identify which children are at higher probability of having an underlying genetic diagnosis. Mutations in COL4A3, COL4A4 and COL4A5 that make up the glomerular basement membrane results in a clinical spectrum of disease including Alport syndrome and thin basement membrane disease with widely differing prognoses. Progression to chronic kidney disease can occur during childhood making early interventions important. The benefits of genetic diagnosis are many, including determining carrier status, understanding disease phenotype and prognosis, early implementation of ACEI therapy as well as avoiding invasive renal biopsies. However, genetic testing is costly and so the aim of this project is to identify features that make testing more likely to be positive.

**Methods** We analysed a group of children referred to our tertiary paediatric nephrology unit, for persistent microscopic haematuria between 2014-2018 and who had had genetic panels assessing for variants in COL4A3,4,5 and 6 and NPHS2 by next generation sequencing. The purpose of this retrospective cohort review was to assess the clinical features of those...
tested, and to investigate if any of those features corresponded with a greater likelihood of predicting a genetic diagnosis. Information was obtained by accessing electronic clinical records. Of the 99 children who had genetic testing, 5 children were excluded due to insufficient available information. The characteristics that were assessed in the 94 remaining children included: hearing loss or visual problems either in the proband or in first degree relatives, proteinuria at the time of referral, family history of renal disease, abnormal renal function, hypertension and proteinuria, and a history of previous urinary tract infections. The probability of certain characteristics being associated with an underlying genetic diagnosis was evaluated by calculating likelihood ratios.

**Results** Of the 94 children, 65% were male. Median age was 9 years (range 9 months-16 years). Median time from haematuria onset to referral to the tertiary nephrology centre was 7 months (range 1-108 months) and median time from referral to genetic testing was 8 months (range 1-86 months). 28% of the children were found to have an underlying genetic cause of their haematuria or had genetic variants of yet unknown clinical significance (VUS). In the children who had VUS, 38% of mutations were in COLA43, 31% in COLA4A, 15% in COLA4A5, 8% in COL4A6 and 8% in NPHS2. Of the characteristics analysed, co-existing visual problems demonstrated a notable increased likelihood of a genetic diagnosis (likelihood ratio=25). Co-existing family history of renal disease only led to a marginal increased likelihood of a genetic diagnosis (likelihood ratio=1.87).

**Conclusion** This is the largest single centre review to date correlating clinical phenotype in children with persistent haematuria with COL4 genetic testing. From this we can infer that children who present with haematuria should have an early ophthalmological assessment and those who also have visual impairment should be prioritised for genetic testing to assess for variations in the COL4A genes as this increases the pre-test probability of a positive genetic result.