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Poster presentation

Paradigm Shift – the impact of early rapid genomic sequencing in the diagnosis of kidney disease

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Introduction

Rapid genomic sequencing with results available in clinically meaningful timeframes is becoming feasible. The role in diagnosis and management of patients with kidney disease is unclear.

Methods

Patients were recruited prospectively for rapid whole exome sequencing (WES) with analysis of a pre-determined phenotype specific list of genes of interest and results available within two weeks. This followed review by a nephrologist, clinical geneticist and genetic counsellor who considered inclusion if a result was likely to significantly impact clinical management. Full author list online at KidGen.org.au

Results

Seven patients were recruited ranging in age from 1 month to 14 years. Indications for rapid testing were to avoid a renal biopsy in 3 patients with steroid resistant nephrotic syndrome, a patient with a clinical diagnosis of Alport syndrome and new onset heavy proteinuria, a syndromic child with nephrotic range proteinuria, a baby with undefined cystic kidney disease and a 6-month old who presented with unexplained anuric end stage kidney disease.

Three patients received a definitive diagnosis (ADPKD, Dent disease, primary hyperoxaluria), 1 received a diagnosis which was likely unrelated to their kidney disease (MIRAGE syndrome) and 3 patients did not receive a diagnosis via WES. The most significant result was an unexpected diagnosis of primary hyperoxaluria in a 6-month old. WES results were available within 5 days informing conversion from peritoneal dialysis to hemodialysis and planning for a liver-kidney transplant. Thus avoiding the significant morbidity of oxalate deposition in extra-renal tissues leading to fractures, visual impairment and heart failure and recurrence of the disease if an isolated renal transplant had been performed.

Conclusions

Rapid genomic sequencing has high diagnostic utility in selected patients with renal disease and can inform clinical management within meaningful timeframes. It has the potential to transform the diagnostic pathway for young children, particularly where invasive renal biopsies can be avoided.