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Project: Antenatal renal abnormalities require early postnatal follow up: an analysis of the conditions identified and long term outcomes

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Introduction

Antenatal ultrasound scans can detect renal tract dilatation as an early marker of potential renal tract anomaly, including vesicoureteric reflux (VUR), pelvi-ureteric junction obstruction, or chromosomal abnormality. The first scan is done at 19-20 weeks, followed by a scan at 28-32 weeks where a postnatal follow-up plan is made. A late scan after 32 weeks may also be done. Medical professionals at the Fetal Abnormality Advice Committee (FAAC) review abnormal 19 and 28 week scans. A management pathway for cases of renal anomalies, particularly renal pelvis dilatation (RPD), specific to CDHB is then followed based on the Urinary Tract Dilatation diagnostic grade given to each case. The grades at 28 weeks range from N (RPD <7mm), A1 (RPD 7-10mm +/- central calyceal dilatation), A2 (RPD >10mm + central dilatation), A3 (RPD >10mm + peripheral dilatation) and A4 (other e.g. duplex kidney). Equivalent grades are used postnatally (N, P1, P2, P3, P4).

If an anomaly is detected, babies are rescanned at 6-8 weeks then followed up by a virtual clinic process to allow for ongoing investigation, including more invasive testing such as micturating cystourethrogram (MCU), the gold standard test for diagnosing VUR and other follow-up by paediatricians.

In 2016, A National Consensus Group: Diagnosis, assessment and management of antenatally detected asymptomatic renal tract dilation pathway was developed. National guidelines for RPD cut-off measurements and follow up pathways were introduced in April 2017 to replace the CDHB pathway. The criteria for RPD at 19-20 weeks were changed from 5mm to 4mm and 10mm to 7mm at 28-32 weeks.

Aim

- To identify the proportion of antenatal scans with renal tract anomaly and the UTD classification
- To assess the impact of the introduction of National criteria and subsequent investigation pathways

Impact

Assessing the impact of new RPD screening cut offs on the rates of antenatally detected cases, diagnoses made, and postnatal outcomes will allow refinement of the National pathway.

Methods
An audit on data from 2014-2017 was completed to assess the changes to cases of RPD meeting follow up criteria, diagnoses made, and postnatal outcomes pre and post the introduction of National pathway in April 2017.

Key words such as dilatation and renal were used to search for cases on the CDHB radiology department, FAAC and virtual clinic patient list databases. Data was not extracted from the Pacific Radiology Group database due to constraints with searching by specific key words.

Data was analysed to determine the positive predictive value of certain RPD in the two different datasets, along with Chi Square and t-test analysis.

Results
Overall, 514 cases were included in the audit, with 388 cases before April 2017 and 126 after. There was a 50% increase in cases of renal anomaly discussed by FAAC due to an increase in late scans and the change in RPD cut off criteria from April 2017.

At the 28-week scan and the late scan, there was no difference in cases of central and peripheral calyceal dilatation between the two time periods after the criteria were changed as per the National pathway.

There were 50% of cases graded as A3 after April 2017 versus 38.1% before, which can be attributed to finding of peripheral calyceal dilatation in particular in the late scans. As a result, there were proportionally more MCUs were ordered after April 2017.

The A4 group made up 31.5% of the dataset. Family history of VUR made up 32.7% of this group, and the rest are due to other renal anomalies with a high proportion of duplex kidneys. This group should be reviewed independently as these cases are not part of the National pathway.

Prenatal grade	**Pre- April 2017**	**Post- April 2017**	**P- value Chi square**
N	58 (15%)	9 (7.1%)	0.003
A1	37 (9.5%)	21 (16.7%)	
A2	12 (3.1%)	1 (0.8%)	
A3	148 (38.1%)	63 (50%)	
A4	133 (34.3%)	32 (25.4%)	

At the 6-8 week scan, there was no difference between cases of central and peripheral dilatation pre and post the introduction of National pathway.

Postnatal grades were not significantly different after April 2017, but there was a trend to more postnatal grades being Normal (N) (p-value 0.4).

A MCU was done for 74% of the cohort. The diagnosis of VUR was made in 16.4%. There were more abnormal MCU results prior to 2017 (25.9%) compared to after April 2017 (13.5%). The new system has resulted in more MCUs being done with a lower rate of high grades of vesicoureteric reflux (MCU grade 3-5). Thirteen cases from both datasets were identified at the late scan with high-grade VUR postnatally. If they did not have a late scan they would not have been investigated and may have presented with a UTI in the first year.

Conclusion

Renal tract anomaly cases have increased since April 2017 due to a change in late scans and RPD cut off. Postnatally, no additional abnormal diagnoses have been made, and more babies are discharged from follow-up. Therefore more tests are being done on babies than previously. The increase in MCUs is applying more pressure on pediatric radiology services.

The next step for this research is to add data from 2018 to the audit in order to increase the statistical power. An analysis of VUR babies who present with UTI will be done to determine the predictive value of antenatal and overall postnatal VUR diagnosis. Analysing later outcomes and interventions would further this research by exploring the long-term cost-benefit of the National pathway.