Approved by Quality & Patient Care Committee
August 2018

RENAL PYELECTASIS – NEONATAL MANAGEMENT

This Local Operating Procedure is developed to guide safe clinical practice in Newborn Care Centre (NCC) at The Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this Local Operating Procedure.

INTRODUCTION

There is a lack of consensus in the postnatal management and follow-up of infants with renal pyelelctasis. The following guidelines are based on the best available evidence and/or the consensus achieved among the neonatologists at the Royal Hospital for Women (RHW) and paediatric nephrologists and urologists at Sydney Children's Hospital (SCH).

1. AIM

- To provide appropriate follow up and management of infants with antenatally diagnosed renal pyelectasis

2. PATIENT

- Newborns

3. STAFF

- Medical and nursing staff

4. CLINICAL PRACTICE

Clinical Practice Guidelines:

1. Assess the antenatal renal pelvic diameter (ARPD) and the gestational age at the time of ultrasound. If more than one antenatal ultrasound performed antenatally, look for persisting or worsening ARPD on the scans and note down the worst ARPD.
2. Categorise the infant into the appropriate category of renal pyelectasis
    - Definition of renal pelvic dilatation – >5 mm ≤32 weeks and >7 mm > 32 weeks[1]
    - Mild pyelectasis – Isolated ARPD >5 mm ≤10 mm at ≤ 32 weeks and >7 mm ≤10 mm at >32 weeks
    - Severe pyelctasis – ARPD >10 mm
3. Look for other renal abnormalities in the antenatal US report including:
    - *Are the changes bilateral?
    - Are the kidneys normal size?
    - Any calyceal dilatation?
    - Any renal parenchymal thinning?
    - Any abnormal corticomedullary differentiation?
    - Any change in renal echogenicity?
    - Any mention of distal ureteric dilatation?
    - Any bladder dilatation?
    - Any ureterocele?
    - Any oligohydramnios?
    - *Is it male gender?

NOTE: For any male infant with bilateral dilatation suspect posterior urethral valves and investigate appropriately.

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4. Check the records if the SCH urology/renal team have been consulted antenatally. If yes, update them about the infant's arrival.
5. Important numbers for SCH referrals:
    - Renal Registrar pager 47263/clinic appointment phone 21646
    - Paediatric urology fellow (mobile through switch, best way of contacting urology team)

Isolated, unilateral or bilateral ARPD ≤10 mm with all the criteria in step 3 normal (Fig 1):

6. Arrange for postnatal renal ultrasound 7-14 days of age.
7. Arrange for a follow-up check with the results at RHW well baby clinic around 2-4 weeks of life:
    - If postnatal US is normal with no dilatation – It is suggestive of benign or transient pyelectasis that is likely to resolve spontaneously. Arrange for a further follow-up at 3 months with a repeat renal US to confirm that complete resolution happened. We can cease follow-up after complete resolution.
    - If postnatal US shows ARPD >7 mm but <10 mm – Outpatient follow-up with renal US is recommended at 3, 6, 12 and 24 months. This can be arranged by the GP or paediatrician. At any time during this follow-up, when renal scan shows the pelvic diameter <7 mm or resolved and no other pathology, follow-up scans can be ceased.
    - If postnatal US shows increasing dilatation ≥10mm – Commence prophylactic antibiotics and arrange for MCU. Consider MAG3 diuretic renogram (Nuclear Medicine Department ext: 22200) and refer to Sydney Children's Hospital urology or nephrology team for further follow-up and management. (MCU and MAG3 scan are performed to investigate for pelviureteric junction obstruction, vesicoureteric reflux and other renal tract anomalies.

Moderate-severe unilateral ARPD >10 mm (Fig 2):

8. Arrange for postnatal renal ultrasound by day 1-3 before baby gets discharged home from the hospital.
    - If postnatal US confirms ARPD of >10 mm or associated with other renal pathology, (a) perform serum urea, creatinine, and electrolytes; (b) commence antibiotic prophylaxis; (c) arrange for MCU; (d) consider MAG3 scan to rule out obstruction if no VUR; (e) page the SCH urology/renal team for a review before the baby gets discharged home.
    - If postnatal US shows only mild dilatation (>7 mm ≤10 mm), arrange for a repeat renal US on day 7-14 of life (to ensure adequate hydration) and commence the baby on prophylactic antibiotics and arrange for SCH renal team referral.

Severe ARPD >15 mm or bilateral when at least one side is >10 mm:

9. Needs immediate review within 1-2 days after birth: (a) perform serum urea, creatinine, and electrolytes; (b) commence antibiotic prophylaxis; (c) arrange for MCU; (d) consider MAG3 scan to rule out obstruction if no VUR; (e) page the SCH urology/renal team for a review before the baby gets discharged home.

5. DOCUMENTATION

- eMR

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6. EDUCATIONAL NOTES

- Antenatal pyelectasis is diagnosed in 1-5% of all pregnancies.
- Despite its frequency, the significance and appropriate postnatal management remains controversial.[1]
- Isolated mild pyelectasis (ARPD of <10-12 mm) is usually a self-limited condition and may resolve, stabilize or improve during follow-up in vast majority of patients (80-98%) and needs minimal investigation.[2,3,4]
- However moderate to severe pyelectasis (ARPD >10-12 mm) is associated with variable outcomes and warrants further investigations to rule out associated pathologies such as pelvi-ureteric junction obstruction, vesico-ureteric reflux, posterior urethral valves etc.[1,2,3]

Definition and grading of Antenatal Renal Pyelectasis

- Foetal renal pelvis size increases with gestational age in an almost linear fashion, with the 50th percentile being at approximately 4 mm at 20 weeks and 7 mm at term.[5]
- Based on the nomogram developed by Obido et al[5], we have defined antenatal pyelectasis as renal pelvic dilatation – >5 mm ≤32 weeks and >7 mm >32 weeks.

Causes of neonatal hydronephrosis[6]

- Transient or physiologic hydronephrosis
- Pelviureteric junction obstruction
- Vesicoureteric reflux
- Ureterovesical junction obstruction (Megaureter)
- Posterior urethral valves
- Ureterocele
- Dilatation of one moiety of a duplex kidney due to either obstruction or reflux

Associated pathologies

- The majority of mild foetal pyelectasis are idiopathic, benign and/or transient with no other associated renal pathology. A meta-analysis of 7 studies of isolated antenatal hydronephrosis showed that 98% of patients with anterior-posterior pelvic diameter <12 mm resolved, stabilised, or improved during follow-up.[2]
- Moderate-severe pyelectasis can be associated with other renal pathology. The two most common are pelviureteric junction obstruction followed by vesicoureteric reflux.[3]

Prophylactic antibiotics

- Children with antenatally diagnosed pyelectasis secondary to VUR have a more benign course with a higher resolution rate of VUR as compared with children discovered to have VUR after a febrile infection. The decision to place a child with ARPD on prophylactic antibiotics remains controversial.[3-4,6-11]
- Preferred antibiotics:
    - Neonatal Period: Cephalexin (12.5 mg/kg daily as single dose)
    - Post-Neonatal Period: Cotrimoxazole (2mg of trimethoprim component/kg daily as a single dose)
    - At the time of MCU: Give full treatment dose (i.e. QID cephalexin or BD cotrimoxazole) on the day of and for 2 days after MCU.

7. RELATED POLICIES/PROCEDURES/CLINICAL PRACTICE LOP

- Nil

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8. RISK RATING

- Medium

9. NATIONAL STANDARD

- Standard 1 Governance for Safety and quality in Health Service Organisation
- Standard 4 Medication Safety
- Standard 6 Clinical Handover

10. ABBREVIATIONS AND DEFINITIONS OF TERMS

NCC	Newborn Care Centre	US	Ultrasound
RHW	Royal Hospital for Women	MCU	Micturating Cystourethrogram
SCH	Sydney Children's Hospital	MAG3	Mercaptoacetyltriglycine
ARPD	Antenatal Renal Pelvic Diameter	VUR	Vesicouereteric Reflux

11. REFERENCES

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12. AUTHOR

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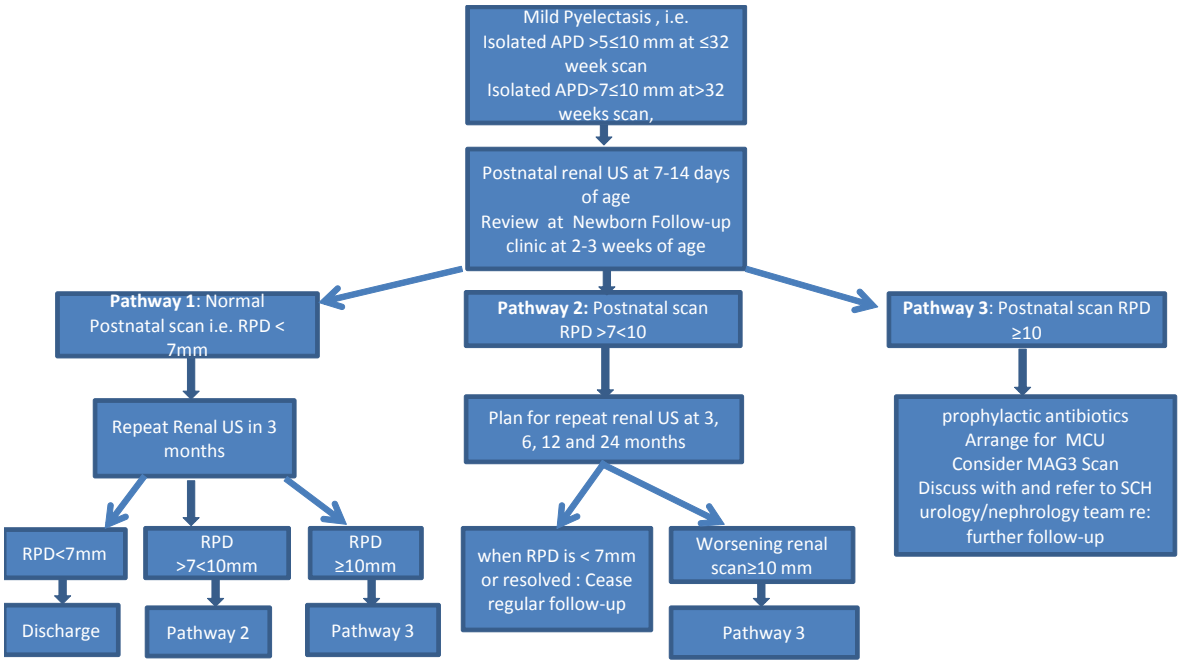
…./Appendices

Appendix 1. Mild Pyelectasis. Isolated Unilateral or bilateral Antenatal Pelvic Renal Dilatation ≤10 mm. Infants who develop a documented UTI anytime during this follow-up need careful review and follow-up (beyond the scope of these guidelines).



Appendix 2. Moderate to severe pyelectasis. Unilateral or bilateral Antenatal Pelvic Renal Dilatation >10 mm. Any other renal pathology (eg. single kidney, oligohydramnios, abnormal echogenicity) prompts discussion with SCH urology/nephrology team.