Renal Pyelectasis – Neonatal Management

1. BACKGROUND

- Other terms: Hydronephrosis.
- Foetal pyelectasis is diagnosed in 1-5% of all pregnancies.
- Despite its frequency, the significance and appropriate postnatal management remains controversial.\(^1\)
- Isolated mild pyelectasis (Antenatal Renal Pelvic Dilatation, 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 (PUJ) obstruction, vesico-ureteric reflux (VUR), posterior urethral valves etc.\(^1,2,3\)
- There is a lack of consensus in the postnatal management and follow-up of these infants.
- The following guidelines are based on the best available evidence and/or the consensus achieved among the neonatologists at the Royal Hospital for Women and paediatric nephrologists and urologists at Sydney Children’s Hospital.

2. CLINICAL PRACTICE

- Definition of renal pelvic dilatation - > 5mm ≤ 32 weeks and >7mm after 32 weeks\(^1\)
- 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.
- 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?*

*For any boy with bilateral dilatation suspect posterior urethral valves and investigate appropriately.
• Check the records if the SCH urology/renal team have been consulted antenatally. If yes, update them about baby’s arrival.

• 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); Dr Nathalie Webb (at POWP ext 44954 or SCH ext 21923); Dr Farnsworth (POWP Ext 44745)

• For isolated, unilateral or bilateral ARPD ≤10 mm with all the above criteria normal (Fig 1)
  o Arrange for postnatal renal ultrasound after the first week of life (7-14 days of age to ensure normal hydration of the infant)
  o 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 at this stage.
    ▪ If postnatal US showing RPD but less than 10 mm – Outpatient follow-up with renal US is recommended at 3, 6, 12 and 24 months. This can be arranged by their 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, rule out PUJ Obstruction and VUR. Arrange for MCU and 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.

• Moderate-severe unilateral ARPD >10 mm(Fig 2)
  o Arrange for postnatal renal ultrasound by day 1-3 before baby gets discharged home from the hospital.
    ▪ If postnatal US confirms APD of >10 mm or associated with other renal pathology, (a) perform serum urea, creatinine, and electrolytes (b) commence antibiotic prophylaxis, (c) arrange for VCUG (d) consider MAG3 scan to rule out obstruction if no VUR and (e) page the SCH urology/renal team for a review before the baby gets discharged home.
- If postnatal US shows only a mild dilatation, arrange for a repeat renal US on day 7 of life (to ensure adequate hydration) and in the meantime, commence the baby on prophylactic antibiotics and arrange for a SCH renal team referral.

- **Severe APRD >15 mm or bilateral when at least one side is >10 mm**
  - It needs **thorough urgent investigations** and paediatric urology and/or nephrology teams should be contacted for further investigations before baby gets discharged home.

*Infants who develop a documented UTI anytime during this follow-up needs a careful review and follow-up (beyond the scope of these guidelines).*
Fig 2. Moderate to severe pyelectasis: Unilateral or bilateral Antenatal Pelvic Renal Dilatation >10 mm*

3. EDUCATIONAL NOTES

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 wk and 7 mm at term.9,13

- Based on the nomogram developed by Obido et al13, we have defined the antenatal pyelectasis as renal pelvic dilatation - > 5mm ≤ 32 weeks and >7mm after 32 weeks.

- Associated pathologies

<table>
<thead>
<tr>
<th>Causes of neonatal hydronephrosis14</th>
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<tbody>
<tr>
<td>Transient or physiologic hydronephrosis</td>
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<tr>
<td>Pelviureteric junction (PUJ) obstruction</td>
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<tr>
<td>Vesicoureteric reflux</td>
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<td>Ureterovesical junction obstruction(Megaureter)</td>
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<td>Posterior urethral valves</td>
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<tr>
<td>Ureterocele</td>
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<td>Dilatation of one moiety of a duplex kidney due to either obstruction or reflux</td>
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- Majority of mild foetal pyelectasis are idiopathic, benign and/or transient with no other associated renal pathology. A recent meta-analysis of 7 studies of isolated antenatal hydronephrosis showed that 98% of patients with anterior-posterior pelvic diameter <12 mm resolved, stabilized, or improved during follow-up.2

- Moderate- severe pyelectasis can be associated with other renal pathology. The two most common are pelviureteric junction (PUJ) obstruction followed by vesicoureteric reflux (VUR).3,12

*Any other renal pathology such as single kidney, oligohydramnios, abnormal echogenicity etc, prompts discussion with SCH urology/nephrology team.
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 APD on prophylactic antibiotics remains controversial.1,7

- Preferred antibiotics:
  - Neonatal Period: Cephalexin (12.5 mg/kg daily as single dose)
  - Post-Neonatal Period: Cotrimoxazole (2 mg of trimethoprim component/kg daily as a single dose)
  - At the time of MCUG: Give full treatment dose (i.e. QID cephalexin or BD cotrimoxazole) on the day of and for 2 days after MCUG.

4. REFERENCES


