Renal Pelvis Dilatation (Pyelectasis) – Detected Antenatally

This document is applicable to all medical and midwifery staff caring for the newborn. It should be used in conjunction with the relevant pharmacy monographs and local guidance for the arrangement of radiological investigations.

Introduction
Dilatation of the renal pelvis detected on antenatal ultrasound examination has an incidence of between 0.5 and 1% and may be associated with significant renal disease in a small number of babies. However in the majority of babies the condition is benign and may be classed as isolated renal pelvis dilatation. The challenge, within the population of babies scanned antenatally, is to identify the small number of babies who have significant renal disease requiring later surgery or long term follow-up of renal function without subjecting large numbers of ‘normal’ neonates to unnecessary investigations and antibiotics. Some conditions may require urgent management such as obstruction to urinary flow- posterior urethral valves and pelviureteric junction obstruction (PUJ). Vesicoureteric reflux (VUR) is more common and the benefits of early detection are not clear. Although there are varied approaches between centres as to the optimum method of antenatal classification, investigation and follow-up, recently there has been a gradual shift upwards in the cut-off value for investigation of renal pelvis dilatation. The following approach reflects the outcomes of recent systematic literature review.

Screening of pelvic dilatation
In the absence of universal detailed antenatal anomaly scanning in Scotland, assessment of the fetal kidneys must be opportunistic. An assessment of the renal system should be mandatory in all pregnancies undergoing a detailed scan and include-:

- An assessment of the presence, size and morphology of each kidney
- An exact measurement of the AP pelvic diameter in mm
- An assessment of the presence or absence of calycectasis
- An indication of unilateral or bilateral disease
- An assessment of the bladder wall and distal ureters
- Documentation of any parenchymal abnormality
  (e.g. renal cortical thinning, lack of corticomedullary differentiation)

Ultrasound scans should be performed by an experienced sonographer.

Details of renal tract, including the dimensions of each renal pelvis & the presence of any of the features listed above, should be clearly documented in the mother’s notes and in the paediatric communication section.
Parents should receive clear advice as to the nature of the problem seen and the course of events following birth. Parent information sheets are available with this guideline (Appendix).

The paediatric team should be informed antenatally if the scan indicates that the baby will fall into the high risk pathway, and there is a need for early investigation (right hand side of the flow chart below). Antenatal counselling of the family by an experienced paediatrician is desirable in these cases.
Cut-off AP measurement for investigation and prophylaxis
Traditionally, a renal pelvic diameter (RPD) cut-off of 5-7mm has been accepted in the second trimester with wide ranging reports of 5mm to 20mm3-7. The most recent review and meta-analysis of the literature, while recognising the limits of mainly observational studies, concludes that isolated AP dilatation less than 12mm has not been associated with significant morbidity and resolved in all cases studied8. Other recent large UK studies have reported little requirement for later intervention other than surveillance for dilatation below 12mm9. At levels above 12 mm the literature is too varied to allow for meaningful analysis however it is clear that an RPD above 15mm confers a higher risk for significant obstruction to urinary flow1,11,12. However, local audit has shown that infants with normal or low risk RPD but who, in addition, have one or more of the listed risk factors have a higher incidence of problems and must be treated as per the high risk pathway13.

Antibiotic prophylaxis
The benefit of antibiotic prophylaxis to prevent breakthrough infections in this population is unclear. In the mild isolated group of babies, with RPD10-15mm, there is little evidence that picking up mild vesicoureteric reflux at this stage makes a difference to long term outcome and therefore Trimethoprim prophylaxis is not indicated or logical for this population10. In cases where the baby is at a high risk of urinary obstruction (RPD>15mm) or where there is already evidence of renal damage, antibiotic prophylaxis should be commenced at birth pending results of early imaging. With all babies, appropriate advice must be given to parents on the importance of urine testing if the baby is unwell and prompt treatment of infection if detected. (see appendix)

Timing of follow-up
- Babies in the high risk group with an RPD >15mm or with other risk factors - calycectasis, parenchymal abnormality, ureterocoele, bladder wall thickening, oligohydramnios, bilateral disease require review by a neonatal consultant and a rapid USS in the first 2 weeks of life. (N.B. an USS before 72 hours may be misleading and should be avoided if possible). Following confirmation of significant RPD>15mm on USS or other risk factors, as detailed, a DMSA request should be followed by verbal and written referral to nephrology consultant.
- With milder dilatation serial US scans have been shown to be as effective as an MCUG to exclude significant VUR 4,5.
- Babies in the lower risk category should be referred for renal USS at 6-8 weeks age and 6 months age.
- Review of 1st USS will decide the need for further investigation of renal function (DMSA)

Exit from screening
A clear endpoint to follow up is desirable with most patients being categorised as ‘normal’ or ‘requiring further investigation and a renal/urological review’. A third category of baby may be followed up in a general neonatal/paediatric clinic if the DMSA is normal and the dilatation remains between 12-15mm with further investigation and treatment at the discretion of the consultant involved. Please note that in older children a pre- and post-micturition USS should be requested to exclude significant dilatation.

Parent information
Parents should have access to straightforward explanations of the condition at every stage. Information leaflets emphasize the reason for investigation, the reason for prophylactic antibiotics when prescribed and the consideration of urinary tract infection as a cause of illness. (appendix)

Audit
It is recommended all babies undergoing postnatal investigation should be notified to a central contact to audit outcomes and follow-up.
References

5. Khalid Ismaili, Fred E. Avni, Michelle Hall Results of systematic voiding cystourethography in infants with antenatally diagnosed renal pelvis dilatation journal of paediatics, volume 141(1),Pages 21-24
6. Ulman, ibrahim; jayanthi, venkata r.; koff, stephen a. the long-term followup of newborns with severe unilateral hydronephrosis initially treated nonoperatively J Urol Volume 164(3) Part 2 of 2, September 2000, pp 1101-1105
7. Stocks, Alton; Richards, Douglas; Frentzen, Barbara; Richard, George Correlation of Prenatal Renal Pelvic Anteroposterior Diameter with Outcome in Infancy Pediatric UrologyVolume 155(3)

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Start / Review Dates
Start Date 05/02/14 Review Date 01/02/17
Appendix 1
Draft guideline for management of Antenatal Renal Pelvis dilatation

When renal pelvis dilatation is seen an alert should be placed in the infant’s notes, documenting:
- the renal pelvis diameter measurement (RPD) in mm
- other risk factors
  - calyceal dilatation
  - ureteral dilatation
  - ureterocoele
  - any parenchymal abnormality
- oligohydramnios
- lack of urine in bladder
- bladder wall thickening
- bilateral findings

Antenatal Isolated RPD ≥10mm

- No antibiotic prophylaxis
- Book Postnatal USS for 4-6 Weeks and 6 months

Review USS and patient at 3 months

RPD <12mm
- Repeat USS at 6 months
- RPD ≥12mm
- Arrange DMSA

RPD <12mm at 6month
- Discharge

RPD ≥12mm
- DMSA normal
- USS 3-6 months
- RPD<12mm
- Annual USS Pre and post micturition
- OPC follow-up to 3 yrs

DMSA <45% function/
RPD ≥15mm at any stage or clinical concern
- Start antibiotic prophylaxis
- Phone and letter

Refer to Nephrology

Antenatal RPD ≥15 mm
- Any other risk factor above (even if RPD <15mm)
- Prophylactic antibiotic
  - Trimethoprim 2mg/kg OD

Inform neonatal consultant
- Urgent Postnatal USS Day 4-14*
  - If confirmed RPD ≥15mm
  - OR any of the additional risk factors
  - book DMSA (>3months) and refer

*An USS too early in the first week of life may underestimate the degree of dilatation

Appendix 2 (page 5&6) – Parental Information Sheet - Renal Pelvic Dilatation 10-15 mm
Appendix 3 (page 7&8) – Parental Information Sheet – Renal Pelvic Dilatation >15mm
What is a DMSA scan?
This test is used to show how well the kidneys are working. It will require a cannula (“drip”) to be inserted, usually into the back of the hand. A very mild radioactive dye is injected which goes through the kidneys and pictures are taken a short while later.

What next?
If this is required you will have another clinic appointment with the results. Depending on the results it may be that further action is not needed other than periodic outpatient appointments with an ultrasound scan. In some babies we will require further input from your nearest paediatric kidney specialist team. This will be fully explained to you in the clinic.

Is there anything I should be looking out for or doing differently?
Your baby should be treated entirely normally. It is very important to ask for medical help early if your baby has a fever or is unwell so that a urine sample can be checked for infection. Early treatment with a full course of antibiotics is important if this is positive.

have any questions about this condition feel free to ask your paediatrician, GP, health visitor or Community Midwife for more information.

Useful numbers:

**Ayrshire Maternity Unit, Crosshouse Hospital**
Paediatric Secretary No: 01563 825457
Xray Dept: 01563 577115
Royal Alexandra Hospital, Paisley
Paediatric Secretary No: 0141 314 6738/6737
Xray Dept: 0141 314 6258

**Wishaw General Hospital**
Paediatric Secretary No: 01698 0366481
Xray Dept: 01698 366522

Princess Royal Maternity, Glasgow
Paediatric Secretary No: 0141 211 5229
Southern General Hospital, Glasgow
Paediatric Secretary No: 0141 201 2228/2297
Yorkhill, RHSC
X-ray department: 0141 201 0096

And finally....

This leaflet is designed to give general information on antenatally detected renal pyelectasis. If you
Antenatally detected renal pyelectasis

What is antenatally detected renal pyelectasis (ADRP)?

This is where the tubes that drain urine from the kidneys (renal pelvis) are more swollen than usual:

How is it detected?

ADRP is seen during ultrasound scanning during pregnancy, and can be found from 20 weeks. The size of the renal pelvis can be measured and compared to normal sizes.

What causes it?

In many cases there is no abnormality, the measurements are just larger than normal, and will return to normal size after birth.

In some babies there is a weakness of the valve that stops urine going back up the ureters from the bladder. This is known as vesicoureteric reflux (VUR).

Rarely, babies may have a blockage at the junction of the ureters and the renal pelvis. This is known as pelviureteric junction obstruction (PUJ obstruction).

What will happen after my baby is born?

The paediatrician will request an ultrasound scan for your baby. This may be done locally or at your nearest children’s hospital depending on your area (it is like the scan you had when you were pregnant). The appointment will be sent out to your house and is normally within the first 2 months. This scan will look at the kidneys in greater detail, and remeasure the renal pelvis (the area that was swollen before).

When will I get a result?

You will be given an appointment to come back to a paediatric clinic here when your baby is around 8 weeks old. It takes about 2 weeks for the scan results to come through, so if your scan has been delayed or there is less than a 2 week gap before your appointment call the paediatric secretary number below to re arrange the appointment. This will ensure that we have the results available to discuss with you. If you do not hear from the scan department please phone the contact number below to arrange another appointment.

What will happen after this?

This depends on the size of the swelling seen in the womb, the measurements made on the scan and how well your baby has been. If all is well with your baby and kidney swelling is better or unchanged we will simply arrange a second scan at 6 months of age as a final check. This is the case with most babies. In a small number of babies with increasing swelling we will need to organise a different type of scan called a DMSA scan.
When will I get a result?
When the results of the ultrasound scan are available you will be given an appointment to come back to a paediatric clinic or you will be contacted by your paediatrician with the result. If the scan remains concerning we will need to organise a different type of scan called a DMSA scan and follow-up may be with your nearest paediatric kidney specialist team.

What is a DMSA scan?
This test is used to show how well the kidneys are working. It will require a cannula ("drip") to be inserted, usually into the back of the hand. A very mild radioactive dye is injected which goes through the kidneys and pictures are taken a short while later.

What next?
Further plans for investigation and follow-up will depend on the results of all the scans as well as the health of your baby and requires detailed discussion between your paediatrician and the specialist kidney team. You will be kept informed of any important issues after each step.

Is there anything I should be looking out for or doing differently?
Your baby should be treated entirely normally. It is very important to ask for medical help early if your baby has a fever or is unwell so that a urine sample can be checked for infection. Early treatment with a full course of antibiotics (over and above the regular night time dose) is important when a urine infection is present.

And finally....
This leaflet is designed to give general information on antenatally detected renal pyelectasis. If you have any questions about this condition please contact your paediatrician, GP or health visitor for more information.

Useful numbers:
- Ayrshire Maternity Unit, Crosshouse Hospital
  Paediatric Secretary No: 01563 825457
  Xray Dept: 01563 577115
- Royal Alexandra Hospital, Paisley
  Paediatric Secretary No: 0141 314 6738/6737
  Xray Dept: 0141 314 6258
- Wishaw General Hospital
  Paediatric Secretary No: 01698 036648
  Xray Dept: 01698 366522
- Princess Royal Maternity, Glasgow
  Paediatric Secretary No: 0141 211 5229
- Southern General Hospital, Glasgow
  Paediatric Secretary No: 0141 201 2228/2297
- Yorkhill, RHSC
  X-ray department: 0141 201 0096

Antenatally Detected Pyelectasis (RPD >15mm)

Parent Information Sheet
Antenatally detected renal pyelectasis

What is antenatally detected renal pyelectasis (ADRP)?
This is where the tubes that drain urine from the kidneys (renal pelvis) are more swollen than usual:

What causes it?
In some cases the measurements are just larger than normal with no underlying problem and will return to normal size after birth. If the swelling is very large or the kidneys do not look normal there is a higher risk of an underlying problem with the flow of urine from the kidney. In some babies there is a weakness of the valve that stops urine going back up the ureters from the bladder. This is known as vesicoureteric reflux (VUR). Rarely, babies may have a blockage at the junction of the ureters and the renal pelvis. This is known as pelviureteric junction obstruction (PUJ obstruction).

How is it detected?
ADRP is seen during ultrasound scanning during pregnancy, and can be found from 20 weeks. The size of the renal pelvis can be measured and compared to normal sizes.

What will happen after my baby is born?
After birth your baby will be seen by a paediatrician. We will prescribe a small dose of an antibiotic called trimethoprim, to be taken once a day at night. This is given as a syrup and taken by mouth. A short term prescription will be organised when you go home. After that you should ask your GP for repeat prescriptions. The dose of antibiotic will change as your baby grows. It is important that you keep giving the antibiotic until you are told that it is OK to stop by a paediatrician.

Why does my baby need antibiotics?
Antibiotics are given in these situations to prevent urine infections. Untreated urine infections may cause damage to the kidneys.

What else will happen?
The paediatrician will request an ultrasound scan for your baby. This may be done locally or at your nearest children’s hospital depending on your area (it is like the scan you had when you were pregnant). We aim to get this done in the first few weeks of life. This scan will look at the kidneys in greater detail, and remeasure the renal pelvis (the area that was swollen before). If you do not hear from the scan department please phone the contact number below to arrange another appointment.