INITIAL MANAGEMENT OF NEWBORNS WITH PRENATAL DIAGNOSIS OF RENAL ABNORMALITY

A consensus of UC San Diego Medical Center and Rady Children’s Hospital San Diego
2010
Management of **Antenatal Hydronephrosis (AHN)** can be confusing!

Undiagnosed reflux or obstruction can lead to infection, kidney stones, renal dysfunction, and renal failure:
- 20% of infants (<24 mos) with reflux will develop UTI
- 20% of UTI with fever in young infants results in renal scarring
- Renal scars can result in hypertension, and progress to renal failure
- 8% of children with reflux may go on to have renal insufficiency

OB team, Radiology, Primary Care Provider, and Pediatric Urology need to communicate with each other.

Only 30% of infants with known AHN receive proper evaluation after birth!

We suggest the following as a guideline for newborn evaluation:

1. **How do the Fetal Radiology Providers describe AHN?**
   - Pyelectasis/pelviectasis/caliectasis are terms used to describe AHN
   - The standard measurement is an anterior-posterior diameter (APD) of the fetal renal pelvis
   - Abnormal is > 7 mm after 32 weeks (>4 mm early in pregnancy requires follow-up at 32 weeks)
   - Keyhole bladder is a description suggesting bladder obstruction

2. **What are the chances that these newborns will have a significant renal abnormality?**
   - 10% of those with mild AHN (8-9 mm APD)
   - 50% of those with moderate AHN (10-15 mm APD)
   - 90% of those with severe AHN (>15 mm APD)

3. **What will the post-natal evaluation of these infants reveal?**
   - 60% will have resolved their AHN
   - 20% will have Vescicoureteral Reflux (VUR) graded 1-5
   - 15% will have Ureteropelvic Junction Obstruction (UPJ) graded mild-moderate-severe
   - 5% will have either bladder/ureteral obstruction, cystic, single or malpositioned kidneys

4. **What tests to order and when?**
   - Mild AHN/asymptomatic infant should have Renal-Bladder Ultrasound (US) at birth or 4 weeks of age
   - Moderate AHN should have US at birth and VCUG at birth or 4 weeks of age
   - Severe AHN or suspected bladder outlet obstruction should have US and VCUG before birth hospital discharge
   - Renal-Bladder US alone will not detect VUR nor rule-out obstruction
   - Consider performing VCUG during birth hospitalization if you have concerns about compliance
   - Infants with single functioning kidney may benefit from VCUG to detect VUR and protect remaining kidney
   - Note that persistent hydronephrosis without reflux is assumed to be UPJ obstruction

5. **What are the radiation doses for these and other common neonatal studies?**
   - CXR = 0.5 mSv
   - VCUG = 5 mSv
   - Isotope cystogram = 0.05 mSv
   - Abdominal CT scan = 3 mSv

6. **Who needs antibiotics?**
   - Infants with AHN who will have an outpatient VCUG should be on antibiotics until VCUG
   - Antibiotics should be continued in infants with any grade VUR or mod-severe UPJ to prevent infection/renal scarring
c. Note to Radiology: assure that infants found to have VUR are on antibiotics the day of their VCUG to prevent UTI
d. Antibiotic of choice: Amoxicillin 10 mg/Kg/day or Cephalexin 10 mg/Kg/day in one daily dose (PRN refills for one year)
e. No antibiotics needed if US and VCUG normal
f. After 2 months other antibiotics are okay to use (e.g. Nitrofurantoin, TMP/SMX)

7. What is recommended follow-up for Primary Care Provider?
   a. AHN that has resolved at birth and 4 weeks may benefit from an additional US at 12 months to assess renal growth
   b. Infants with grade 1-2 VUR can be followed with yearly US and VCUG (or Isotope Cystogram) by Primary Care Provider-based on comfort level; these patients are believed to have a lower rate of renal scarring than those with higher grade VUR

8. Who should be referred to Pediatric Urology?
   a. Infants with grade 3 or higher VUR, or any UPJ, ureterovesicular junction obstruction or other unusual genitourinary anomaly should be referred on antibiotic prophylaxis to Peds Urology within 4-8 weeks of diagnosis
   b. If infants with grade 1-2 VUR have breakthrough UTI, consider referral to Peds Urology
   c. If you have questions about VUR/UPJ follow-up recommendations, please contact Peds Urology
   d. Reinforce to parents that yearly re-evaluation is critical, that a year of treatment does not ‘cure’ VUR
   e. If other renal abnormalities are present (posterior urethral valves, ureterocele, solitary kidney, multicystic dyplastic kidney, ureterovesicular junction obstruction, stones, etc) consult or refer
   f. Please make a copy of radiologic studies at discharge and ask the parents to bring a CD of US and VCUG films to Peds Urology (a copy of the radiology report is not sufficient)

9. References:
   c. Belarmino JM, Kogan BA. Management of neonatal hydronephrosis. Early Human Development. 2006;82(1);9-14

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AHN

APD 8 to 9 mm

RENAL US @ BIRTH

US NORMAL: REPEAT @ 4 WEEKS

#2 US NORMAL: CONSIDER FINAL US @ 12 MOS

#2 US ABNORMAL: VCUG (ON ABX) & FOLLOW

US ABNORMAL: VCUG @ BIRTH OR @ 4 WEEKS (ON ABX) & FOLLOW

NO HYDRONEPHROSIS NO VUR

REPEAT US @ 4 WEEKS & 12 MOS

MILD HYDRO: NO ABX & REFER TO UROLOGY

 MOD TO SEVERE HYDRO: ABX & REFER TO UROLOGY

GRADE 1 to 2 VUR: ABX & PCP MANAGE

GRADE 3 to 5 VUR: ABX & REFER TO UROLOGY

APD > 10 mm

RENAL US @ BIRTH

VCUG @ BIRTH OR @ 4 WEEKS (ON ABX)