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Postnatal outcome of antenatal hydronephrosis in infancy

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Abstract
Objectives: To define the clinical outcomes of isolated antenatal hydronephrosis (ANH) in infancy.
Material and Methods: A retrospective analysis of data from 90 patients with isolated ANH in our hospital was performed. Newborns with ANH were followed up for a period of one year with ultrasonographic measurement of renal pelvic diameter (RPD). RPD was classified as mild (5–9.9 mm), moderate (10–14.9 mm) or severe (≥15 mm).
Results: Out of the 90 cases of isolated ANH (60 boys and 30 girls),58% had no postnatal hydronephrosis in USG done at first week of life, while 32% had dilated prominent renal pelvis in the postnatal USG of 41 patients with mild dilatation,7(18%) had uropathy,3 infants presented with UTI in the follow-up period. Majority of patients with mild fetal RPD have no significant findings in infancy.
Conclusions: In contrast to patients with moderate/severe RPD, infants with mild RPD do not require invasive diagnostic procedures but only follow up for UTI and progression of RPD.

Keywords: antenatal hydronephrosis; urinary tract, antero-posterior diameter of the renal pelvis

Introduction

The widespread use of ultrasonography in screening for fetal anomalies has resulted in antenatal detection of many urinary tract anomalies and disorders1. This early detection results in earlier management and intervention, thereby decreasing the number of neonates presenting with urosepsis in the postnatal period. Dilation of the fetal renal collecting system, antenatal hydronephrosis (ANH), is one of the most common abnormalities detected on prenatal ultrasonography, reported in approximately 1-5% of all pregnancies.

ANH represents a wide spectrum of urological conditions, ranging from transient dilation of the collecting system to clinically significant urinary tract obstruction or vesicoureteric reflux (VUR). It is associated with complications such as urinary tract infection (UTI), kidney stones and renal dysfunction or failure. Consequently, the goals in evaluating children with ANH are to prevent these potential complications and to preserve renal function.

These benefits are tempered by the heightened concern raised and often excessive evaluation that is initiated when anatomic variants or incidental findings are discovered4. However, not all findings on prenatal US represent pathology; many are transient and have no clinical significance. The dilemma therefore is to distinguish children who require follow up and intervention from those who do not1.

AIMS

This study was aimed at evaluating the clinical outcome of 90 infants with isolated antenatal hydronephrosis followed. The results are analyzed under four domains-RPD progression, incidence of UTI, surgery requirement and growth.

Materials and Methods

90 infants born at KVGMCH, Sullia from, May 2019 to September 2019 who were found to have isolated fetal renal pelvic dilatation (RPD) in either of the trimesters were included after taking informed consent.

A convenient type of study with a average sample size of 90 was taken and was followed by cohort for the period of infancy.

They underwent postnatal USG in first week of life for urinary tract anomalies and were prospectively followed with serial USG and urine examination if first USG was abnormal or child showed any symptoms. RPD was measured by assessment of the antero posterior diameter (APD) of the renal pelvis by qualified US consultant. RPD was classified as mild (5–9.9 mm), moderate (10–14.9 mm) or severe (≥15 mm). For analysis purposes, when appropriate, the moderate and severe categories were merged into a single category.

Inclusion Criteria

Presence of RPD equal to or greater than 5 mm on prenatal ultrasound after 28 weeks' gestation associated with normal amniotic fluid.

Exclusion Criteria

Twin pregnancy

Associated other anomalies like ureterocele, hypoplastic kidney, and posterior urethral valves, other congenital anomalies of other system.

Results

A total of 90 cases of isolated ANH (60 boys and 30 girls) were included (male to female ratio of 2:1). The data was entered in excel format and results were analyzed using statistical software SSPE version 20.0.(P value was found <0.001). As shown in Table 1, out of 90 infants, 52 were assigned to the group of non-significant findings (58.1%) and 38 to the group of significant uropathy (42%). Of 40 patients with mild dilatation, 7 (18%) presented a urinary tract anomaly, whereas 13(46%) infants with moderate RPD and 18 (82%) with severe RPD had uropathy. (Bar diagram 2).

Table 1

Postnatal diagnosis	Mild (%) (5-9.9 mm)	Moderate (%) (10-14.9 mm)	Severe (%) (>15 mm)	Total Children
Non Significant findings				
Idiopathic dilation	32 (67)	12 (25)	4 (8)	48
Extra-renal pelvis	1 (25)	3 (75)	0 (0)	4
Significant findings				
UPJO	3 (11)	9 (33)	15 (55)	27
VUR	4 (50)	3 (34)	1 (16)	8
Megaureter	0 (0)	1 (33)	2 (67)	3
Total	40(44)	28(32)	22(24)	90

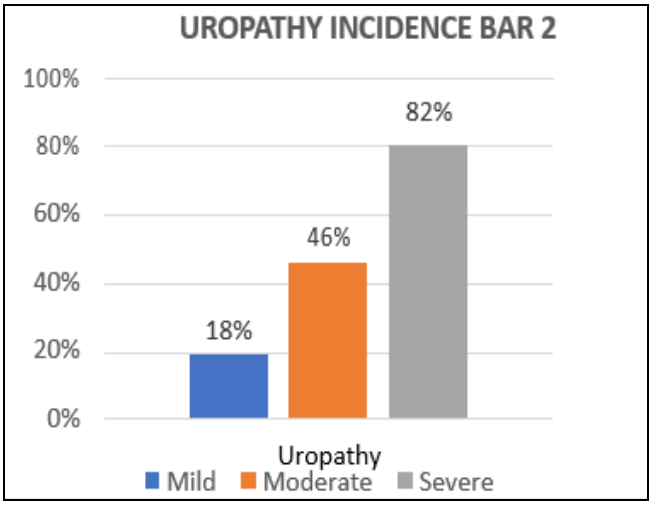

Fig 1: (Bar diagram 1)

Course

Median follow up time for 12 months depending on the postnatal subsequent US scans.

Clinical course of infant was analyzed under progression of RPD, urinary tract infection, requirement of surgical intervention and growth monitoring3.

RPD Progression

RPD progression by serial US scans were analyzed in 57(63%) of infants who had RPD dilatation in first postnatal US scan.

It was found that rate of resolution of RPD diameter in infancy was 70%, 44%, L25% for mild, moderate and severe RPD respectively. (Bar diagram 3)

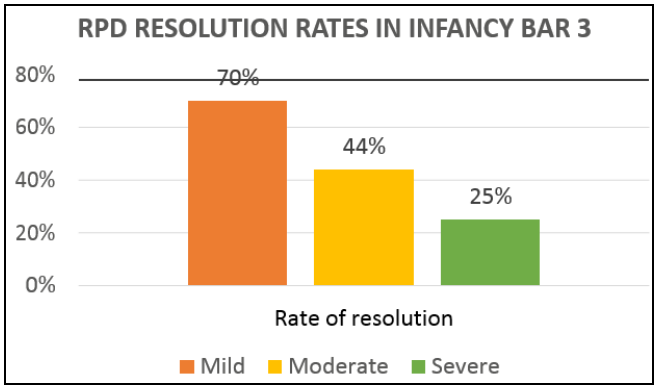

Fig 2: (Bar diagram 2)

Urinary Tract Infection

During follow-up, UTI occurred in 15(14%) of the 90children followed. The incidence of UTI during follow-up was higher among infants with moderate/severe RPD (20%) than among patients with mild RPD (7%).

But the population has higher incidence of UTI comparing to general population.

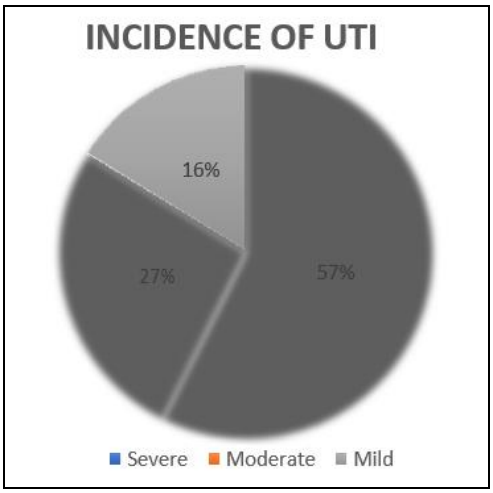

Fig 3

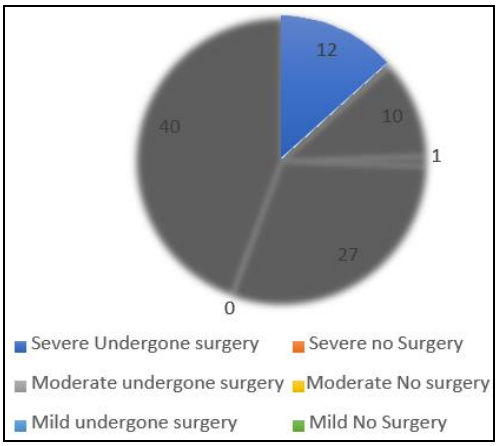

Fig 4

Surgical Intervention

Out of 22 infants with severe RPD, 12 (55%) underwent surgery, whereas only one (3%) of 28 with moderate RPD required surgical intervention. In contrast, none of 40 infants with mild RPD needed any surgical procedures.

The median age at surgery was 7 months (range: 5–13). All of them had increasing hydronephrosis at sequential US scans.

A cut-off of 15 mm for RPD showed the best diagnostic performance in identifying patients who required surgical intervention. DSR and serial progression and palpable lump and UTI repeated incidence was related to need for surgery.

Growth

Mean height and weight of all infants were normal as that expected for age.

Discussion

Regular ANC US scans has led to frequent identification of fetuses with ANH5. Post-natal evaluation of ANH shows majority of patients with isolated ANH has no demonstrable associated abnormality.

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