

NEONATAL FOLLOW UP OF ANTENATALLY DETECTED FETAL RENAL PELVIC CALYCEAL DILATATION-AN OBSERVATIONAL STUDY

DR NIDHIN MATHEW
POST GRADUATE TRAINEE

DR K K DIWAKAR
PROFESSOR & HOD NEONATOLOGY

DR LEELA KAMATH
ASSOC. PROFESSOR NEONATOLOGY

MALANKARA ORTHODOX SYRIAN CHURCH MEDICAL COLLEGE KOLENCHERY, KERALA

Objectives

To assess the progression in the first month of life of antenatally diagnosed renal pelvic calyceal dilatation(RPD).

Introduction

- Widespread antenatal screening has resulted in increased detection of anomalies of the kidneys and urinary tract. Ultrasound screening during pregnancy has resulted in increasing recognition of fetal hydronephrosis. Depending on diagnostic criteria and gestation, the prevalence of antenatally detected hydronephrosis (ANH) ranges from 0.6-5.4%. The condition is bilateral in 17.54%(1).
- Antenatal ultrasound may show significant abnormalities of kidney and urinary tract in 1-2 per 1000 live births(4).
- Antenatally diagnosed dilatation of the urinary tract can result from either impairment of urine flow or retrograde reflux of urine.
- Dilatation of the renal pelvis and calyces is the first anatomical response to impairment of urine flow and may lead to histological damage of the renal parenchyma and changes in renal function (10).
- Children with any degree of antenatal hydronephrosis are at greater risk of postnatal pathology as compared with the normal population(7). Antenatal hydronephrosis (ANH) is transient and resolves by the third trimester in almost one half cases.
- The likelihood of detecting obstruction is considerably higher in patients with SFU (The Society for Fetal Urology) grade 4 or renal anteroposterior diameter exceeding 20-30 mm(8)

Methods

- The retrospective study included 91 infants born between 2012 and 2015 with antenatally diagnosed fetal renal pelvic calyceal dilatation(RPD) who were admitted to the neonatology unit of a rural tertiary care centre in South India. The neonates were allocated to groups based on pelvic anteroposterior diameter (APD) detected on antenatal ultrasound and postnatal progression was studied.

CLASSIFICATION	RENAL PELVIC ANTERO POSTERIOR DIAMETER, APD	
	SECOND TRIMESTER	THIRD TRIMESTER
MILD	4-5mm	7-9
MODERATE	7-10mm	10-15
SEVERE	>10mm	>15

Revised Guidelines on Management of Antenatal Hydronephrosis, Indian Pediatr. 2013;50: 215231

Sample size calculation

- In this study, the prevalence value of antenatally detected renal hydronephrosis was found to be 0.6%-5.4%. The median range is 3%.
- Expected proportion=0.03
- Precision = 3.5%
- Confidence Level = 95%
- Required Sample size=91

STATISTICAL METHOD

- Chi square test was used to analyze the data.

	MILD	MODERATE	TOTAL
Postnatal Size	62	23	85
Sample size	17.94%	27.06%	100.00%
Postnatal Size	4	2	6
Sample size	4.71%	2.33%	100.00%
Postnatal Size	66	25	91
Sample size	72.53%	27.47%	100.00%

POST-NATAL SIZE=INCREASING/ SAME



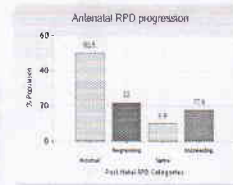
Odds-based parameters	Estimate		Lower	Upper
	OR	95% CI		
Chi-Square	1.04	0.001	0.001	0.001
Multivariate	1.04	0.001	0.001	0.001
P-value	0.001	0.001	0.001	0.001

Statistical tests	Estimate		Lower	Upper
	OR	95% CI		
Chi-Square	1.04	0.001	0.001	0.001
Multivariate	1.04	0.001	0.001	0.001
P-value	0.001	0.001	0.001	0.001

The chi-square statistic is 0.0197. The p-value is 0.8883. $p > 0.05$

Results

Incidence of Antenatal RPD



Incidence

- Bilateral hydronephrosis-54% which is in confirmation with the existing studies.

Progression

- Forty-six out of ninety-one (50.5%) antenatal renal pelvic calyceal dilatation became normal, twenty out of ninety one (21.98%) regressed, nine out of ninety-one (9.9%) remained same, sixteen out of ninety-one(17.6%) increased on post-natal ultrasound.
- 27% in mild/moderate ARPD groups increased postnatally & 33% in severe ARPD groups also increased. The chi-square statistic is 0.0197. The p-value is 0.8883.
- Mild ARPD - 56.75% became normal, 14.2% regressed, 10.8% remained same, 16.8% increased postnatally.
- Moderate ARPD - 27.2% became normal, 54.5% regressed, 18.1% increased.
- Severe ARPD - 16.6% became normal, 50% regressed, 16.6% remained same, 16.6% increased.

Conclusion

- Mild pelvic calyceal dilatation mostly regressed. The moderate and severe hydronephrosis groups also showed regression postnatally with some requiring follow up scan.
- Longer follow up is being carried out to find the progression of ultrasound finding postnatally and its correlation with antenatal findings.
- Post natal ultrasound is an important investigation to be done in all categories of antenatal renal pelvic dilatations irrespective of antenatal findings.

References

- Revised Guidelines on Management of Antenatal Hydronephrosis, Indian Pediatr. 2013;50: 215231
- Adli: Sirin, Arvind Bagga, Anurag Krishna, Minu Bajaj, M Srinivas, Rajesh Upad and Indira Agarwal For the Indian Society of Pediatric Nephrology. All India Institute of Medical Sciences, Ansari Nagar, New Delhi 110 029, India. Email: adliinbas@gmail.com
- Ek S, Lidefeldt KJ, Varricco L. Fetal hydronephrosis: prevalence, natural history and postnatal consequences in an unselected population. Acta Obstet Gynecol Scand. 2007;86:14636.
- Indian Pediatric Nephrology Group, Indian Academy of Pediatrics. Consensus statement on management of antenatally detected hydronephrosis. Indian Pediatr. 2003;38:124451.
- Livers LN, Brookfield DS, Eglington JA, Mowbray JM. Antenatal ultrasonography to detect fetal renal abnormalities: prospective screening programme. BMJ. 1999;328:14213.
- Saizem S, Alkhalaf A, Sesson S, Thilaganathan B. Natural history of fetal hydronephrosis diagnosed on mid-trimester ultrasound. Ultrasound Obstet Gynecol. 2001;17:1916.
- Lee RS, Cendon M, Kinnaman DD, Nguyen HT. Antenatal hydronephrosis as a predictor of postnatal outcome: a meta-analysis. Pediatr. 2006;118:54693.
- de Kort EH, Sambamurti S, Zegers SH. The long term outcome of antenatal hydronephrosis up to 15 millimeters justifies a noninvasive postnatal follow-up. Acta Paediatr. 2008;97:70813.
- Nguyen HT, Hendon CD, Cooper C, Gatti J, Kirsch A, K Chirakoski P, et al. The Society for Fetal Urology consensus statement on the evaluation and management of antenatal hydronephrosis. J Pediatr Urol. 2010;5:21231.
- Rennie and Robertson's Textbook of Neonatology, 5th Edition

