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Original Research Article

Pattern of Congenital Anomalies of Urinary System in Newborn - A Hospital Based Study

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ABSTRACT

BACKGROUND: The present study aims to study the incidence and pattern of urinary system anomalies in our region.
MATERIAL AND METHOD: It is a cross-sectional study conducted in the Department of Obstetrics and Gynaecology, SMGS hospital, GMC Jammu over a period of one year from October 2012 to September 2013. All women diagnosed antenatally with urinary system anomalies and delivered during study period were included. Maternal and neonatal characteristics were recorded.
RESULTS: 52 cases of kidney and urinary tract anomalies were antenatally diagnosed with incidence of 3.36 per 1000 births. The most common anomalies of this system were hydronephrosis (57.69%), followed by multicystic kidneys, polycystic kidneys, renal dysplasias, and renal agenesis in decreasing order of their frequency. These anomalies were more in male babies as compared to female babies (p value= 0.035).
CONCLUSION: Study of urinary tract anomalies is very important as their timely diagnosis can help in planning post natal care and treatment.

Key Words: Congenital, anomaly, urinary tract, hydronephrosis, male, female

INTRODUCTION

A congenital anomaly is any alteration present at birth of normal anatomic structure and has cosmetic, medical or surgical significance. Mckeown and Record (1960) defined congenital malformation to be 'a macroscopic abnormality of structure' attributable to a faulty development and present at birth. Alternatively, it may be defined as a permanent anatomical, histological and biochemical defect which the individual cannot repair through growth and development. [1] In general, we cannot measure the incidence of congenital anomalies due to the prenatal loss of fetuses such as blighted ova, miscarriages and ectopic pregnancies. [2] Various sources estimate the prevalence of congenital anomalies to be in the range of 1-3% of all live born infants and considerably higher for infants that are still born or spontaneously aborted. [3-5] The rate increases to 5-6% when the ascertainment period is extended to the age of 5-6 years. In spite of increasing frequency of congenital anomalies, the underlying cause for most remains obscure. It has been estimated that around 15-25% anomalies are due to recognized genetic conditions (chromosome and single gene causes), 8-12% are due to environmental conditions (maternal conditions, drug or chemical exposure) and 20-25% are due to multifactorial inheritance. [6] Congenital

anomalies, regardless of their cause can affect any organ or system of the body, yet some types of congenital anomalies are more common than others. Congenital anomalies of the kidney and urinary tract [CAKUT] represent 20-30% of all antenatally diagnosed fetal congenital anomalies in developed countries. [7] Early diagnosis and management of these anomalies is important as these can lead to end stage renal diseases. Limited data is available regarding prevalence and pattern of urinary system anomalies in our region, which is the northernmost part of the country. The present study aims to study the pattern of these anomalies.

MATERIALS AND METHODS

The present study was conducted in the Department of Obstetrics and Gynaecology, SMGS Hospital, GMC Jammu over a period of one year. All pregnant women who had ultrasound scans revealing anomalies of urinary system were included in the study. Maternal demographic data including age, parity, and residence were recorded. Neonatal characteristics such as gestational age at the time of delivery, birth weight, APGAR score at birth, sex and type of anomaly were recorded. Statistical analysis was done using SPSS software and reported as percentages deemed appropriate for variables.

RESULTS

During the study period, 52 cases of urinary system anomalies were detected out of 15447 births at SMGS Hospital in one year giving an incidence of 3.36 per 1000 births. The majority of the affected fetuses were males, 33(63.46%) in number out of 52. Females were affected in 18(34.61%) cases and one case was diagnosed as having ambiguous genitalia [p value=0.035, which is statistically significant].

Out of 52 cases diagnosed with urinary system anomalies, 11(21.15%) had other associated anomalies including central nervous system, cardiovascular, musculoskeletal, gastrointestinal systems and 41 cases(78.85%) had isolated urinary system anomalies.

Regarding various subtypes of anomalies of this system, it was observed that hydronephrosis was the most common, followed by multicystic kidneys, polycystic kidneys, renal dysplasias, renal agenesis, obstructive uropathy and renal caliectasis in decreasing order of their frequency. Table 1 demonstrates the pattern of distribution of urinary system anomalies.

Hydronephrosis was diagnosed in 30(57.69%) fetuses. It was present in 20(66.67%) male fetuses as compared to 10(33.32%) female fetuses .Hydronephrosis was reported as mild, moderate or severe. Table 2 represents the degree of antenatally diagnosed cases of hydronephrosis. This can be an important tool for treating doctors postnatally as many mild to moderate cases of fetal hydronephrosis resolve spontaneously and early intervention can save kidney from permanent damage.

Table 1 showing pattern and frequency of urinary system anomalies.

Type of anomaly	Congenital anomalies			
	Male No.	Female No.	Ambiguous No.	Total No. (%) (n= 52)
Cystic kidney	7	2	0	9(17.30)
Hydronephrosis	20	10	0	30(57.69)
Polycystic kidney	1	4	0	5(9.62)
Renal dysplasia	2	1	0	3(5.77)
Renal agenesis	0	1	1	2(3.84)
Kidney calectasis	1	0	0	1(1.92)
Obstructive uropathy	2	0	0	2(3.84)
Total	**33(63.46%)**	**18(34.61%)**	**1(1.92%)**	**52 (100)**

With regard to renal parenchymal disease, the major proportion was constituted by multicystic kidneys, accounting for 17.30% of total anomalies, with 7 cases (77.78%) in male fetuses and cases (22.22%) in female fetuses. This was

followed by 5 cases (9.62%) of polycystic kidneys, 1 (20%) in male fetus and 4 (80%) in female fetuses.

Table 2 showing degree of hydronephrosis in affected fetuses

DEGREE	NUMBER
Mid(5-10mm)	12
Moderate(10-15mm)	31
Severe(>15mm)	9
TOTAL	52

Renal dysplasia was present in 3 fetuses, 2 in male and 1 in female, accounting for 5.77% of total anomalies of this system. Renal agenesis and obstructive uropathy were present in two fetuses each.

In the current study, majority of urinary system anomalies were present in fetuses of mothers>35 years of age (30.76%). With regard to parity, 51.92% of these anomalies were present in para four and above mothers. Four mothers had family history of anomalies. Consanguinity was present in two mothers. No mother gave history regarding intake of any drug or chemical exposure.

DISCUSSION

In our study, the incidence of urinary system anomalies was found to be 3.36 per 1000 births. These anomalies constituted 13.79% of total congenital anomalies reported in the hospital. In a study conducted by Bondagji, [8] the prevalence of antenatally diagnosed CAKUT was 3.26 per 1000 births, similar to our study. Sallout et al [9] showed that genitourinary anomalies were the most common fetal anomalies diagnosed in the antenatal period constituting 38.6% of all anomalies diagnosed in that centre. Mosayebi et al (2007) [10] reported genitourinary anomalies to be the commonest (32.1%).

Of all urinary system anomalies, hydronephrosis was the most frequent abnormality seen (57.69%) representing an incidence of 1.94 per 1000 births. The majority of hydronephrosis cases occurred in male fetuses (66.67%) as compared to female fetuses (33.32%). This finding is in consonance with study by Bondagji. [8] Multicystic and polycystic kidneys accounted for 17.30% and 9.62% of total anomalies of this system respectively. Shawky and Sadik (2011) [11] also a reported polycystic kidneys to constitute 15.76% of urinary anomalies. The incidence of multicystic and polycystic kidneys was reported to be 0.58 and 0.32 per 1000 births respectively in our study. This finding is in consonance with study by Schreuder MF. [12] Renal agenesis was present in two fetuses accounting for prevalence of 0.129 per 1000 births. Bondagji [8] reported renal agenesis to be 0.27 per 1000 births. Anomalies of urinary bladder and urethra were less frequent in our study, may be due to less incidence or less reporting in antenatal scans.

In current study, 21.5% cases were associated with anomalies of other systems. Wiesel et al [13] in their study showed association in about 30% of cases.

In our study, 3.84% anomalous fetuses were out of consanguineous marriages while in study by Bondagji, [8] 40.4% were from the same. Such a high incidence of anomalies out of consanguineous marriage in study by Bondagji [8] may be because of high rate of these marriages in Saudi Arabia as reported by author only.

CONCLUSION

Limited data is available regarding prevalence and pattern of urinary system anomalies in our region. This study aims to provide pattern of these anomalies as their understanding and early diagnosis can considerably reduce perinatal mortality and morbidity. Data of this study can act as a base for further etiologic research so that efficient measures can be taken to prevent these deadly effects and form a basis to find out the reason for sex differences.

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