SONOGRAPHIC INCIDENCE OF CONGENITAL ANOMALIES OF THE KIDNEY- A STUDY IN BANGLADESH

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ABSTRACT

To assess the sonographic frequency of congenital renal anomalies, we retrospectively reviewed the results of whole abdominal and genitourinary ultrasound studies of 12005 cases performed over a period of 6 years between January 1995 to December 2000. The study was done among the patients who came to Ultrasound unit of the Nuclear Medicine Centre, Khulna, Bangladesh for ultrasound examination. Ultrasound revealed renal anomalies in 44 patients for an incidence of 1: 273 (0.36 percent). Males were more affected than females, the ratio being 1.4: 1. Of these anomalies, Unilateral renal agenesis dominates the list with the incidence of 1: 750 (0.13 percent). Ectopic kidneys were found in 12 patients with the incidence of 1: 1000 (0.10 percent). Adult polycystic kidneys were found in 11 patients with the incidence of 1: 1091 (0.09 percent). 3 patients (0.02 percent) had hypoplastic kidney and 2 cases (0.02 percent) with crossed fused ectopia. No apparent serious discrepancy is noted for each of the above anomalies in comparison to other studies.

Key words: Renal anomalies, Ultrasonography

INTRODUCTION

Congenital anomalies of the kidney comprise a diversity of abnormalities, ranging from absence to aberrant location, orientation and shape. The urinary organs may be maldeveloped owing to genetic defects or to environment. However, the etiology of majority of malformations is not known[1]. Most of the renal anomalies are clinically asymptomatic. The diagnosis is usually not suspected or remains undetected unless an imaging study done for other reasons[2]. In the past the usual method of detection had been excretory urography but now-a-days ultrasonography is available in most of the places in Bangladesh. As ultrasound is a safe, non-invasive and less costly it becomes a popular investigation modality as a routine procedure for any doubtful condition in our country and ultrasound examination for unrelated reason have been discovering more asympatomatic renal anomaly cases incidentally. There are several studies regarding the incidence

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of various renal anomalies[2,3,4] but no such studies have been undertaken in this region. The aim of our study was to evaluate the incidence of various congenital anomalies of the kidneys in Bangladeshi population.

MATERIALS AND METHODS

The results of whole abdominal and genitourinary sonographic studies of 12005 patients performed at the Ultrasound Unit of the Nuclear Medicine Centre, Khulna, Bangladesh, between January 1995 to December 2000, were reviewed. Sonographic studies were done through transabdominal approach using a Siemens Sonoline SL-2 real time ultrasonogram equipped with both 3.5 MHz linear and sector transducer. The usual preparation was done in all the cases and genitourinary ultrasound was done with full urinary bladder. Renal ultrasound examinations are routinely performed with the patients in both the supine and the prone positions at our institution.

RESULTS

Of the total 12005 cases, 44 patients were found to have congenital renal anomalies of which 26 were male and 18 were female. The overall frequency of renal anomalies was 0.36 percent. We found 5 types of renal anomalies with male : female ratio being 1.4:1 (Table-I). Of these anomalies, 16 patients (0.13 percent) had unilateral renal agenesis with male female ratio 1.6:1. Left kidney was found to be absent in 9 cases and right kidney was absent in 7 cases. Ectopic kidneys were found in 12 patients (0.10 percent) of which 7 were female and 5 were male with female male ratio 1.4:1. Left kidney was ectopic in 7 cases and right kidney was ectopic in 5 cases. 9 were pelvic kidney and 3 kidneys were placed in iliac region. A 27 years young man presented with palpable pelvic mass and was interpreted as gross hydronephrotic pelvic kidney (left), which was confirmed on surgery; the right kidney was normal.

11 patients (0.09 percent) had adult polycystic kidneys with male female ratio 2.6:1. Among these, 7 cases were diagnosed at the age of 35-40 years, 3 cases at 50-55 years and 1 case at 60 years. Associated liver cyst was present in 3 cases. 3 patients (0.02 percent) had congenital hypoplastic kidney of which 2 were male and 1 was female. Crossed fused ectopia was found in 2 cases (0.02 percent) and fusion takes place at right side in both the cases. There were 2 cases of associated anomalies of the genitalia in patients with solitary kidney; 1 patient with bicornuate uterus and 1 patient with hypoplastic uterus.

Table-I. Sonographic incidence of congenital anomalies of the kidneys

Anomaly	Number of patients	Percentage	Incidence	Sex		Position of anomaly		
				Male	Female	Right	Left	Bilateral
Unilateral agenesis	16	0.13	1:750	10	6	7	9	-
Ectopic	12	0.10	1:1000	5	7	5	7	-
Polycystic	11	0.09	1:1091	8	3	-	-	11
Hypoplastic	3	0.02	1:4000	2	1	2	1	-
Crossed fused ectopia	2	0.02	1:6000	1	1	2	-	-
Totals	44	0.36	1:273	26	18	16	17	11

DISCUSSION

Congenital anomalies of the kidneys are not uncommon. Before the advent of modern diagnostic modalities, the majority of cases, though small in number were usually undetected and now-a-days its diagnosis is enhanced in our country due to vast use of ultrasonography. The ultrasound service at our institute does not take selected cases and the patients may considered a good cross section of urology and the findings in this study can be regarded as an excellent index of renal anomalies. Malformations of the kidneys and ureters are of great clinical importance and account for about 40 percent of all pathological conditions akin to these organs[3]. In the study, we have found 44 instances of congenital anomalies of kidneys with the incidence of 1:273 (0.36 percent); this seems to be lower than that of other studies[5,6] and the reason may be that , here, in the study, we have considered only the anomalies of the kidney proper. A consideration of the individuals in this study shows that males were more affected than females, the ratio being 1.4:1 and there was no apparent predilection for either the left or right side, as it occurred 17 times on the left side, and 16 on the right side.

The most frequent anomaly observed in this study was that of absence of one kidney which occurred 16 times for an incidence of 1:750, that is almost close to other studies[5,6,7]. The kidney was found to be absent more on the left side than the right, the ratio being 9 to 7. The next most frequent anomaly was that of renal ectopia, which occurred 12 cases with the incidence of 1 in 1000, that is consistent with other studies[3,7]. The left side is favored over the right, the ratio being 7 to 5 which is also correlate with other study[7]. The ectopic kidney may be found in any of the locations of its normal ascent with just equal frequency[4]. Most ectopic kidneys are clinically asymptomatic but it may appear initially with abdominal pain, urinary infection or a palpable mass. Here, one case was detected as grossly hydronephrotic pelvic (left) kidney that mimicking colonic mass.

Adult polycystic kidney disease was found in 11 patients with the incidence of 1 in 1091, that is almost similar to other studies[6,8]. All the cases were bilateral. It is an autosomal dominant trait and the patient's children have a chance of

inheriting the condition. An early diagnosis either by ultrasound or intravenous urography is very important before starting their family life. Renal hypoplasia occurs sporadically and is probably due either to a deficiency of metanephrogenic tissue or to defective branching of the ureteric bud. This abnormality was found in 3 cases with good renal function. There were 2 cases of crossed fused ectopia for an incidence of 1 in 6000 in this study. Both the cases present with an asymptomatic abdominal mass without any functional impairment. The occurrence of associated anomalies of the genitalia has been variously reported. We found 2 cases of associated anomalies in patient with solitary kidney; 1 patient with bicornuate uterus and 1 patient with hypoplastic uterus.

CONCLUSION

This preliminary study shows the local incidence of various congenital anomalies of the kidneys and we found no apparent serious discrepancy for each of the described anomalies in comparison to other studies. The patient with renal anomalies should be kept under observation to assess renal function and to ensure therapeutic measures when needed.

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