SHORT COMMUNICATION

Antenatal Detection of Renal Malformations

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Our aim was to study the incidence and outcome of antenatally detected renal malformations in rural Maharashtra. Among 7365 deliveries conducted during the study period, antenatal screening for renal malformations was done in 6682 (90.7 %) deliveries. Renal malformations were detected in 35 fetuses on antenatal screening. Postnatal investigations confirmed renal malformations in 27 babies (77.1%), giving an incidence of 0.4% among liveborn babies. Seven babies were operated and 2 were awaiting surgery (33.3%). Two patients expired and another two were lost to follow-up. The outcome was satisfactory in other patients. Antenatal screening was a useful tool in diagnosing renal malformations.

Keywords: *Antenatal Renal malformations, Ultrasonography.*

Routine antenatal ultrasonography is being used increasingly to detect malformations of the fetal urinary tract(1,2). Abnormalities of the urinary tract have been reported to occur in 0.1% to 0.92% of pregnancies(3). Detection rates increase when ultrasound is performed at midtrimester compared to earlier scanning(4). If these anomalies are not detected by prenatal ultrasound and subsequently managed, many of these urologic abnormalities would manifest later in life as pyelonephritis, hypertension or end stage renal disease(5). There is a paucity of studies on antenatally detected renal malformations and its outcome from India. Hence we conducted this study to ascertain the incidence of antenatally detected renal malformation and its short term outcome among live born babies in this region.

METHODS

The study was conducted at Mahatma Gandhi Institute of Medical Sciences, Sevagram, Wardha between January 2005 and December 2006. Over 90% of the mothers who delivered in the hospital were from rural areas of Maharashtra. All antenatal women were screened for renal anomalies by a skilled sonologist in the hospital between 20 to 37 weeks of gestation. All structural abnormalities of the renal tract were reported and anteroposterior pelvic diameter of renal pelvis was noted in cases with hydronephrosis. Senior pediatric staff was available to discuss the implications of suspected abnormalities with the parents. Babies, in whom an abnormality had been detected antenatally, underwent repeat ultrasonography at the end of first week of life. When this confirmed an abnormality, urine examination, renal function tests, micturating cystourethrography (MCU) and isotope DTPA scanning were done as indicated. Babies with hydronephrosis were managed according to the recommendations of Indian Pediatric Nephrology Group(6). Babies needing surgical intervention were managed in the Department of Surgery or referred to tertiary care pediatric surgery centers. All the babies, including those operated outside were followed in our pediatric renal clinic.

RESULTS

Of 7365 deliveries, antenatal screening was possible in 6682 deliveries (90.7%). Renal malformations on

antenatal ultrasonography were reported in 35 cases. The mean gestational age at diagnosis was 32.5 weeks. 77.1% (27 babies) of those with abnormal antenatal scan had renal tract malformation confirmed postnatally, giving an incidence of 0.40% among live born babies. Seven babies had bilateral disease, rest were unilateral. The antenatal scan correctly predicted whether the lesion was unilateral or bilateral in all except one baby. Of 27 babies, there were 16 boys and 10 girls; one had ambiguous genitalia and assigned female after karyotyping. Sixteen babies were born by lower segment cesarean section and 11 by normal vaginal delivery. None had birth asphyxia.

***Table* I** gives the diagnosis and the outcome for these 27 babies. At last follow up, 7 babies were operated and 2 were awaiting surgery. Of the 27 babies in whom an abnormality was detected, 9 (33.3%) had or were soon going to have a surgical intervention. The three babies with vesicoureteric reflux grade II or III disease were on chemoprophylaxis; none had urinary tract infection. Of the eight cases reported as empty renal fossa, five had pelvic kidney on same side, one of which was dysplastic. Two were dysplastic but normal in position and one had unilateral renal agenesis. Two babies with pelvic kidney had additional malformations; one had Pierre Robin sequence and another penile hypospadias. All three babies with posterior urethral valves underwent operation, one had deranged renal functions. There were two deaths and two patients were lost to follow-up. One patient with exstrophy of bladder expired post operatively due to sepsis, another wish multicystic dysplastic kidney with contralateral pelviureteric junction obstruction died at 2 months of life. One baby each of exstrophy of bladder and bilateral polycystic kidney disease were lost to follow-up.

DISCUSSION

The incidence of renal malformation among live born babies (0.40%) is high as compared to the study by Sanghavi, *et al*. (0.20%), which also included still births(7). This could be because the mean gestational age at diagnosis was 32.5 weeks as compared to 28.4 weeks in the previous study. During a screening program for fetal malformation in Sweden, only 9% of renal abnormalities were detected by 17 weeks gestation, but 91% were detected by 33 weeks(8). This is because, ultrasound performed at 30 to 36 weeks of gestation is likely to detect more cases of hydronephrosis.

We assessed the importance of antenatal diagnosis in terms of definite or probable benefit. We assumed that all babies requiring intervention *i.e*., an operation or chemoprophylaxis benefited, then 37% (10/27) benefited from early diagnosis. This is a higher proportion than the previous study from India(7). Probable benefit is difficult to assess because the natural course and implications of PUJ obstruction and unilateral dysplastic kidney are uncertain. Antenatal diagnosis would probably allow early identification of complications like urinary tract infection and hypertension. Therefore 10 additional patients probably benefited (37%).

Fetal urinary sampling or vesicoamniotic shunt insertion was not done in any case. Only in one of the 7 cases, surgical intervention was performed at our center, rest all were done at tertiary care pediatric surgery centers. Any potential abnormality detected during pregnancy is a source of enormous distress to parents and is often compounded by communication

TABLE I DIAGNOSIS AND OUTCOME FOR 27 BABIES WITH RENAL ABNORMALITY CONFIRMED POSTNATALLY

	No.	Bilateral disease	Operative intervention
Antenatally detected hydronephrosis (13)			
PUJ obstruction	6	2	1
VUR (grade II/III)	3	–	
Posterior urethral valve	3	3	3
Ureterocoele	1	–	1
Unilateral empty renal fossa (8)			
Pelvic kidney	5	–	–
Dysplastic kidney	2	–	–
Renal agenesis	1	–	–
Multicystic dysplastic kidney	3	1*	–
Exstrophy of bladder	2	–	2
Bilateral Polycystic Disease	1	1	–

***Contralateral hydronephrosis, PUJ: pelviureteric junction*

WHAT THIS STUDY ADDS?

- The incidence of antenatally detected renal malformations among liveborn babies in rural Maharashtra was 0.4%.

difficulties between relevant specialties, more when postnatal surgery is performed at a distant center. Counseling is difficult due to our limited understanding of the natural history of many problems.

Contributors: AS and PB planned the study, managed the cases, analyzed the data and drafted the manuscript. PC critically reviewed the manuscript. BM was the consultant surgeon in-charge. AT did the radiological interpretation.

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