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Outcome of Prenatally diagnosed Echogenic kidneys – Single center review

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Objective

Normal fetal kidneys are isoechoic with fetal liver or little less echogenic than liver. When renal parenchymal echogenicity is more than that of fetal liver, it is considered hyperechogenic. Hyperechogenicity of kidneys may result from various etiologies thereby resulting in variable outcomes. We aimed to determine the outcome of fetuses with prenatally diagnosed echogenic kidneys to understand the implications of the finding when counselling prospective parents.

Methods

Retrospective review of case records of fetuses with echogenic kidneys over a period of four years from October 2017 to October 2021 at The Fetal Clinic, Puducherry, India. Maternal demographic details, ultrasound characteristics including associated urogenital and extra renal anomalies, available genetic and autopsy findings were abstracted from the fetal database. Postnatal outcome was obtained through telephone contact with the parents. We have divided all the cases into four groups- Group 1-Isolated echogenic kidneys (IS group) Group 2- Echogenic kidneys with other urinary tract abnormalities (KUB group) Group 3- Echogenic kidneys with extra renal abnormalities (other system) and without other urinary tract abnormalities (SS group) Group 4- echogenic kidneys with other urinary tract abnormalities and extra renal abnormalities (combined group).

Results

Seventy four cases were identified over the period of 4 years. Out of which, 12(16%) were unilateral, 62(84%) were bilateral. The mean gestational age at diagnosis was 21 weeks and 6 days Forty-eight cases (64%) had normal liquor at presentation, 23 cases (32%) had oligohydramnios and 3 cases (4%) had polyhydramnios. All three cases with polyhydramnios had multisystem anomalies. Twenty-three fetuses (31 %) had enlarged kidneys and 4 (5%) had small sized kidneys while rest of the fetuses (48, 63%) had normal sized kidneys. Thirty-five cases (47%) had other urinary tract abnormalities while 31 cases (41%) had extra renal malformations. Group wise stratification of data were as follows: Eighteen cases (24.3%) were included in group 1(IS). Mean gestational age of diagnosis was 24 weeks and 2 days. Among them, 14 cases had normal liquor at presentation, 4 had oligohydramnios. Regarding renal size, 11 fetuses had normal sized kidneys, 6 had enlarged kidneys and 1 had small sized kidney. Genetic testing was done for two cases – one showed PKD1 gene mutation and another turned to be normal Twenty-six cases (35.1%) were associated with other urinary tract abnormalities, thus forming group 2(KUB). Mean gestational age at diagnosis was 20 weeks and 6 days. Among them, 16 cases had normal liquor at presentation and 10 had oligohydramnios. Nineteen cases had normal renal size, 7 had enlarged kidneys while none had small sized kidneys. Genetic testing done in one case showed 17q12 deletion. Twenty cases (27%) were included in group 3 (SS). Mean gestational age at diagnosis was 21 weeks and 1 day. Thirteen had normal liquor at presentation, 4 had oligohydramnios and 3 had polyhydramnios. Renal size was normal in 14 cases, enlarged in 5 and small in one. Genetic testing was done in four cases. Two had Trisomy 13, one had 17q12 deletion and one had runs of homozygosity across most of the autosomes excepting 9,19 and 21 involving multiple pathogenic genes. Ten cases (13.5%), which constituted group 4 (combined) had both other urinary tract abnormalities and systemic abnormalities. Mean gestational age at diagnosis was 21 weeks and 2 days. Of them, 5 cases had normal liquor at presentation and 5 had oligohydramnios. Three cases had normal sized kidneys, 5 had enlarged kidneys and 2 had small sized kidneys. None of them underwent genetic testing in this group. Postnatal outcome was available for 66 cases. In group1 - IS: five cases (5/18,28%) underwent termination of pregnancy, 2 cases were lost to follow up, 2 had neonatal death of which one neonatal renal biopsy showed focal segmental glomerulosclerosis with nephrocalcinosis and 9 (9/11, 81%) were alive infants with age ranging from 1 month to 42 months and doing well. In group 2- KUB: Seventeen cases (17/26,65.3%) underwent termination of pregnancy, 3 were lost to follow up and 6(6/26,23%) were living infants of age ranging from 3 months to 38 months with postnatal intervention of cystoscopy fulguration in one, cystoscopic ureterostomy in another and one awaiting surgery. In group 3- SS: Sixteen cases (16/20,80%) had termination of pregnancy and 2 (2/20,10%) had neonatal death of which one had severe growth restriction and two were lost to follow up In group 4 – Combined: All 10 cases (100 %) underwent termination of pregnancy. Six cases had recurrence of similar kidney disease in subsequent pregnancy, and all were consanguineous couples. Among them, clinical picture of five were of cystic renal dysplasia and one was Autosomal recessive polycystic kidney disease. Autopsy was performed in three cases - two cases showed features of cystic renal dysplasia, and one had bilateral polycystic kidney disease.

Conclusion

It is important to perform detailed imaging, prenatal diagnosis and autopsy to determine the etiology and possible recurrence of the disease. Increased renal echogenicity in fetus without associated anomalies and normal liquor may be a nonspecific finding that warrants prenatal and post natal follow up.