INVOLUTION OF UNILATERAL MULTICYSTIC DYSPLASTIC KIDNEY: 15 YEARS FOLLOW-UP STUDY.

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Abstract:

Background:

Unilateral Multicystic dysplastic kidney (MCDK) is one of the commonest abnormalities detected by antenatal ultrasound, with an incidence of 1 in 2,200 to 1 in 4,300 births. This study aims to assess the frequency of MCDK in children presented in our institute, and the determinants associated with the disease with follow-up until adulthood to evaluate the evolution of the disorder.

Methodology:

This is a retrospective, Cohort study, the patients were enrolled retrospectively via eligibility criteria of presented in the hospital within first month of life and diagnosed with unilateral MCDK. The data was entered and analyzed in Statistical package of social sciences version 22, mean and standard deviation were calculated for age, and years of MCDK diagnosis, for independent data frequencies, percentages, mean value, and standard deviation will be analyzed.

Results:

A total of 90 children were enrolled in the study for 15 years, the mean age at presentation was 93.2 ± 137.3 days, with 70 (77.8%) males and 20 (22.2%) female subjects.

While the mean size of MCDK was 6.2 ±1.2 cms on the right side & 5.4 ± 1.63 cms on the left side. Upon follow-up, the 07 (7.8%) children indicated an increase in MCDK size within < 1 year, within 2 years of age, within 4 years of age, and within 8 years.

Conclusion:

Studying 15 years of our MCDK patient records carried data subsidizing existing literature mostly positively encouraging non-operative administration of MCDK with regress follow-up and radiological investigations

Keywords:

Multicystic Dysplastic Kidney, Solitary functioning Kidney, Involution of MCDK

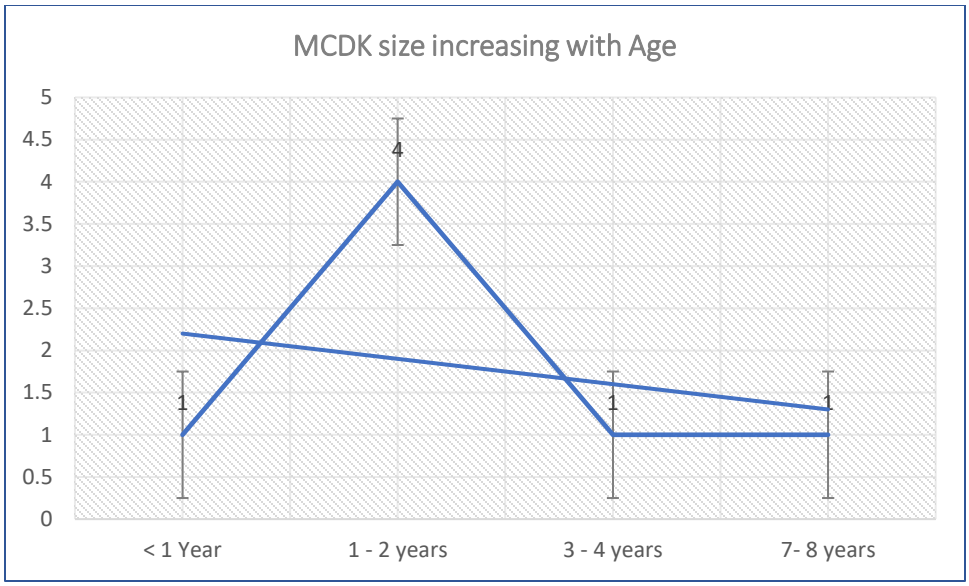
Table I: Subjective and demographic details of MCDK children presented in OPD

Details of study subjects			
Variables (n=90)		Frequency	P-value
Gender	Male	70 (77.8%)	0.12
	Female	20 (22.2%)	
Presentation	Antenatal	6 (6.7%)	0.51
	Postnatal	84 (93.3%)	
Referral	Primary	51 (56.7%)	0.03
	Secondary	39 (43.3%)	
MCDK side	Right	13 (14.5)	0.21
	Left	77 (85.6%)	
Associated factors	Twin pregnancy	7 (7.8%)	0.08
	IUGR	3 (3.3%)	
	None	80 (88.9%)	
Liquor quantity	Adequate	81 (90%)	0.31
	Not adequate	9 (10%)	
Term on delivery	Full term	81 (90%)	0.23
	Preterm	9 (10%)	

The antenatal ultrasound was performed at 21.6 ± 5.9 weeks of gestation, and the mean size of the MCDK kidney from ultrasound at presentation was 5.91 ± 1.3 cms. While laterality differentiated the mean size of 6.2 ±1.2 cms on the right side while 5.4 ± 1.63 cms on the left side. The mean serum creatinine at the time of presentation was 0.4 ± 0.1 mg/dL. Upon follow-up, the 07 (7.8%) children indicated an increase in MCDK size within < 1 year (in 1 patient), within 2 years of age (0 patient), within 4 years of age (in 1 patient), and within 8 years (1 patient). Figure 01

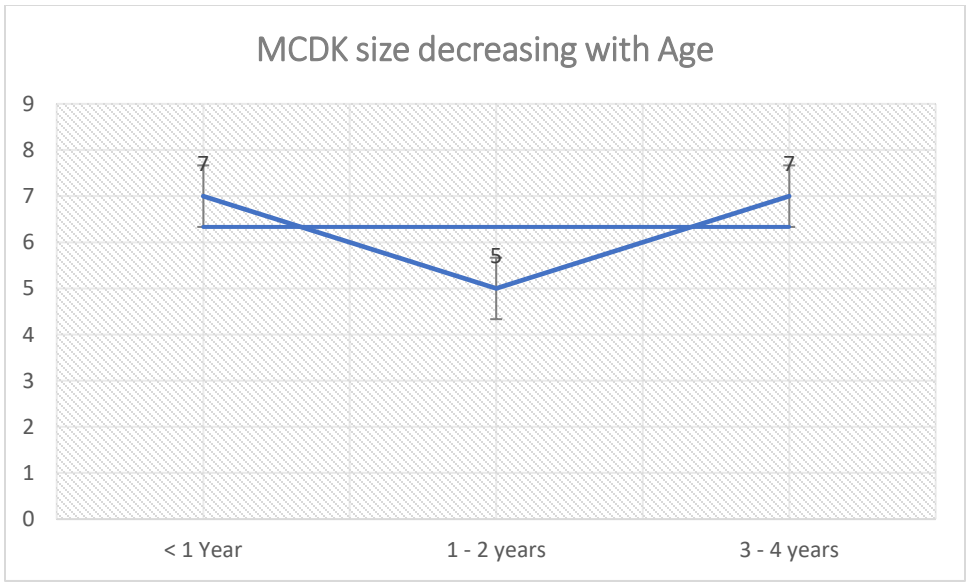
The size increase in these subjects was measured between 3.1 – 4.0 cms to 6.1 – 7.0 cms, and 02 patients with maximum size improvements proceeded with nephrectomy to avoid the relevant risk of malignancy.

Figure I: Frequency of MCDK size improvement with advancement in age of study subjects.



The MCDK was reportedly decreased in the size in 19 (21.1%) patients after conservative management and in-depth evaluation during follow-up, Involution was identified in 7 (7.7%) patients within the first year of age, while 5 (5.5%) within 2 years and another 7 (7.7%) in 4 years of age. Figure II

Figure II: Frequency of MCDK size declines with advancement in age of study subjects



Lost to follow-up patients were contacted via available contact numbers and asked to resume their follow-ups, however, 22 (24.4%) patients were identified and documented as lost to follow-up, and a maximum number of patients were denied to resume their follow-up schedule during 5-6 years of age. The reason for a big number of losses to follow-up during these days could be fear of missing school as health care facility is located at distance and require a minimum of 3 days for patients coming from other cities or nearby villages. Involution was documented as complete, partial, and unchanged respective of laterality of MCDK, results indicated that right (n=13) sided MCDK showed partial involution in 5 (5.5%) patients while 2 (2.2%) were unchanged. While, left (n=77) sided MCDK indicated complete involution in 2 (2.2%) patients,

12 (13.3%) showed particle involution and 33(36.6%) were unchanged. The p-value was 0.04 and 0.007 on right and left sides respectively and was considered statistically significant. Table II

Table II: Involution details of patients with MCDK.

Variables (n=90)		Complete involution	Partial involution	Unchanged involution	P-value
MCDK side	Right (n=13)	0	5 (5.5%)	2 (2.2%)	0.04
	Left (n=77)	2 (2.2%)	12 (13.3%)	33 (36.6%)	0.007

The contralateral side showed pelvic ureter junction obstruction in 3 (3.3%), while Vesicoureteral reflux was diagnosed in 5 (5.5%) of patients.

Discussion:

Multicystic dysplastic kidney (MCDK) is the most common cause of renal abnormality developed during fetal development at gestational age with a higher prevalence in male infants as compared to females. [14] The diagnosis during the antenatal scan is less frequent in developing countries, the reason for minimal antenatal diagnosis of renal anomalies including MCDK might be limited access to antenatal care and denial of radiological investigations during pregnancy by parents. This limitation of antenatal diagnosis has been reported in prior studies as well, [15-16] twin pregnancy was associated with congenital anatomical abnormalities in the fetus, in this study 7 (7.8%) of infants were twins, and Intrauterine growth restriction was presented in 3 (3.3%) of infants indicating minimal risk of MCDK in IUGR children, [17] this study aimed to assess the involution of unilateral MCDK presented in single-center, our results indicated the maximum involution within first 10 years of age. The literature supported our results as studies evaluated maximum positive involution, complete or partial before adulthood. MCDK size was reported as increased during the first 7 years of age with a maximum of 4.00 cms from the first reported size of MCDK, another study indicated a 15% MCDK increase requiring nephrectomy, while another study of 46 patients reported a 39.1% the increase in MCDK size during the first year of age. [13,18] while partial involution of MCDK was previously reported in 40.9% on the right side while 50% on the left side with a p-value of 0.74, our study partial involution was reported as 5.5% and 13.3% on right and left sides respectively. While the complete involution was reported in 27.2% in the same study, our study had 2.2% of complete involution of patients [19]. The reason for the drastic difference between involution between these studies is follow-up duration, we have evaluated patients for a longer period. Associated problems such as Vesico ureter reflux, pelvic ureter junction obstruction, and hydronephrosis were identified in 5 (5.5%) and 3 (3.3%) respectively on the contralateral side of the affected kidney, the study of 80 children diagnosed with MCDK reported VUR in 13 (16.3%) children while PUJO was in 2 (2.5%) only. [20] Other congenital anatomical abnormalities of the renal system were not reported except for recurrent urinary tract symptoms in our study. Nephrectomy was performed in 2 (2.2%) of patients indicating a ≤ 4.0 cms increase in MCDK size, another study reported 7 (5.5%) nephrectomies due to improved MCDK size. [21]

Despite the big patient group, our study is limited as its being retrospectively fabricated. However, cohort study design helped in strengthening the study but gaps in secondary data are undeniable. Another study with a multi-center, large sample size and prospective design is recommended.

Conclusion:

Studying 15 years of our MCDK patient records carried data subsidizing existing literature mostly positively encouraging non-operative administration of MCDK with regress follow-up and radiological investigations. The sample size was not enough to conclude any ultimate answer, however, the duration and time of follow-up should be adjusted as per the involution course of the patient exclusively.

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