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Original Article

Evaluation of Renal Cyst on Ultrasound in Adults

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ABSTRACT

Renal cysts are fluid-filled pockets that develop on or inside of the kidneys. Cysts were usual and incidental findings in routine sonographic examinations of kidneys. **Objective:** To evaluate the location and types of renal cyst using ultrasound. **Methods:** It is a cross-sectional study conducted in 5 months. A sample size of 100 was calculated using previous published related study. All adults above 20 years were included and referred to an ultrasound scan of a kidney. After informed consent data was collected and analysed on SPSS version 20. **Results:** According to the current study renal cysts are most prevalent at the age group of 60 to 80 years having 35(35%) followed by 40 to 60 years 33(33%). The males were more prone to develop renal cysts 55(55%) as compared to females 45(45%). Unilateral cysts were more common 60(30%) as compared to bilateral cysts 40(20%). The occurrence of renal cyst was common in right kidney 65(32.5%) as compared to left kidney 35(17.5%). The renal cysts were commonly present at Cortex 70(70%) and the most common type was simple polycystic kidneys 60(60%). **Conclusion:** In conclusion, the prevalence of renal cyst is higher in old males specifically in the cortical region. Unilateral polycystic kidneys are most common.

INTRODUCTION

In humans, the kidney is paired, a retro-peritoneal organ that is located on the posterior abdominal wall [1]. The right kidney is slightly lower than the left kidney. At the medial aspect of the kidney, the hilum is present that transmits the renal vein, renal artery, renal nerve, and renal pelvic [2]. Kidney is an important organ for its function of excretion of wastes and extra fluid from the body in form of urine hence maintaining a healthy balance of salt, water, and minerals within the body [3]. Kidney is one of the most common origins of cyst formation in the body [4]. Renal cysts are fluid-filled pockets that develop on or inside of the kidneys [5]. Cysts were usual and incidental findings in routine sonographic examinations of kidneys [6]. Most of the renal cysts are benign; however, bleeding, ischemia and infection can make things worse [7]. The characterization of renal masses is significantly aided by sonographic examinations [6]. Ultrasound is a quite useful modality in distinguishing between various forms of renal disease and renal cystic masses [8,9]. cystic kidney disease can be congenital or acquired and disorders can be inherited as autosomal dominant or recessive disorders or they might be caused by other factors [10]. Patients with chronic uremia develop acquired cystic disease and early identification is critical since acquired cystic kidney disease is linked to clinically severe consequences particularly renal cell carcinoma [11]. The adult polycystic kidney disease contains multiple cysts of varying sizes [12]. Ultrasound shows a bilateral enlargement of kidneys [13]. Renal cysts can be simple cysts and haemorrhagic cysts [14,15]. According to the location within the kidneys, it can

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be a simple cortical cyst, peri-pelvic cyst, para-pelvic cyst, and milk of calcium cyst [16]. Internal echoes, pustules membranes, internal echogenic clots, and fluid debris levels are all possible symptoms of a haemorrhagic cyst. These characteristics may reflect those of cystic renal cell carcinoma [17]. Even though the majority are simple cysts, renal cyst disease can be caused by a variety of factors, the specific etiology of simple cysts is not clear. On the surface of the kidney, there is usually only one cyst but it can damage one or both kidneys. Simple cysts which do not induce symptoms normally do not require treatment [18]. Although most renal cysts are discovered by chance and are located on the periphery of the kidney, they can become large enough to cause discomfort, hematuria, hypertension and pelvi-calyceal blockage and the rupture of cyst is less common [19]. The mechanical impact of a space occupying lesion or compression of the collecting system may be visible when renal cyst is very large [19,20]. Risk factors associated with renal cyst may include kidney dysfunction and hypertension [21,22]. Renal cysts affect one-third of the population over the age of 50 years [23]. Renal cysts are more common in patients with increased age and accounts for nearly 40% of all people evaluated on ultrasound [24]. The prevalence of renal cysts in previous studies was 7.7% among older patients around 50 years, while the Individuals younger than 40 years had a prevalence rate of 2.7%. The individuals older than 60 years of age had the highest prevalence of renal cysts as 23.9 percent. Males were found to have 94.8 percent of the cysts, with the majority (63.6 percent) being solitary [6]. Regarding types Cortical simple renal disease (CSRD) was found 73%, para-pelvic simple cysts 17%, and acquired cystic kidney disease (ACKD) was found to be 4.76% [25,26]. Simple renal cysts have 0 mortality rate. By the age of 60, around half of those with polycystic kidney disease (PKD) will have kidney failure, and by the age of 70, about 60% will have a renal failure that can be fatal [27].

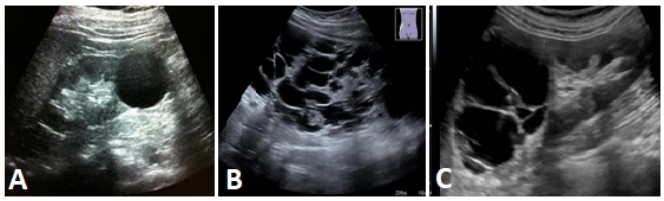

Figure 1A: Simple Cyst 1B: Polycystic Kidney 1C: Complex Cyst

As renal cysts are accidental findings majority of the population is unaware of this condition which may lead to renal dysfunction or complete failure if left untreated. The findings of the study will have a substantial impact on clinical practice particularly in the evaluation, follow-up, and early management of renal cyst. The ultrasound plays a powerful role in evaluating renal cyst although it is a cheap and easily available imaging modality as compared to CT scan and MRI.

METHODS

It is a cross-sectional study conducted in 5 month. A sample size of 100 was collected through a convenient sampling technique. The sample size was calculated from a previous related published study [28]. All adults above 20 years were included and referred to an ultrasound scan of a kidney. The convex probe of high resolution is used with an ultrasound machine (Toshiba Xario 100) for the diagnosis of renal cyst. All the patients were examined in supine and lateral decubitus positions after informed consent. Data was entered and analysed on SPSS version 20.

RESULTS

In the current study, the patients reaching the Radiology Department for ultrasound examination were evaluated. Table 1 shows the categorization of patients age including 20 to 40 years 20(20%) patients, 40 to 60 years 33(33%) patients, 60 to 80 years 35(35%) patients and 80 to 100 12(12%) patients. Renal cysts are most common at the age of 60 to 80 years including 35(35%) followed by 40 to 60 years 33(33%). Table 2 shows the gender of patients in which males are 55(55%) and females are 45(45%). Males are more prone to develop renal cysts 55(55%). Table 3 is showing the location of cysts dividing into right, left, unilateral and bilateral in which unilateral cysts are more common 60(30%) as compared to bilateral cysts 40(20%) and right kidney 65(32.5%) is more likely to develop cyst than left kidney 35 (17.5%). Table 4 shows the location of cysts within the kidney categorized as cortical 70 (70%) cysts, medullary 18 (18%) cysts, and para pelvic 12(12%) cysts. The cortical region of the kidney is more likely to develop a cyst. Table 5 shows the classification of the renal cyst as solitary cyst 32(32%), simple polycystic 60(60%), and complex polycystic 8(8%).

Age (Years)		Frequency (%)	Cumulative Percent
Valid	20-40	20	20.0
	40-60	33	53.0
	60-80	35	88.0
	80-100	12	100.0
	Total	100	

Table 1: Age of Patients

Gender		Frequency	Cumulative Percent
Valid	Female	45	45.0
	Male	55	100.0
	Total	100	

Table 2: Gender of Patients

Location		Frequency (%)	Cumulative Percent
Valid	Unilateral	60	30.0
	Bilateral	40	50.0
	Right side of kidney	65	82.5

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	Left side of kidney	35	100.0
	Total	200	

Table 3: Location of the cyst

Location		Frequency (%)	Cumulative Percent
Valid	Cortical	70	70.0
	Medullary	18	88.0
	Para pelvic	12	100.0
	Total	100	

Table 4: Location of the cyst within the kidney

Classification		Frequency (%)	Cumulative Percent
Valid	Solitary cyst	32	32.0
	Simple polycystic cysts	60	92.0
	Complex polycystic cysts	8	100.0
	Total	100	

Table 5: Classification of Renal Cyst

DISCUSSION

Cysts are usual in incidental findings as a routine sonographic examination of kidneys. Ultrasound plays important role in the characterisation of these masses. The current study used ultrasound for the evaluation and classification of renal cysts in adults. The current study was conducted on 100 patients by using a convenient technique. The subjects in this study were taken between age group 20 to 100. Patients between age group 60 to 80 years were at high risk to renal cyst followed by patients between age group 40 to 60 years whereas the previous study published by Abass 2018 also found similar results including more renal cysts in patients above 50 years [28]. Another study by Moawia Bushra Gameraddin 2016 [29] also supported the result showing 84(89%) patients above 50 years having renal cysts. Both previous studies had similar findings to the current study. The current study found a high prevalence of renal cysts in males. 55 patients were predominantly males with 55% male and 45(45%) female patients which were also discussed in previous study by Abass. The current study also found that unilateral cysts were more common 60(30%) than bilateral renal cysts 40(20%), a study by Abass in 2018 also shows the occurrence of unilateral renal cysts, which is more common than bilateral renal cyst 67% and 33% respectively. The both studies had similar findings relative to the location of the cyst. Moreover, the current study has also evaluated that the right kidney is more prone to develop cyst 65(32.5%) than the left kidney 35(17.5%), this point of the current study resembled the previous study by Moawia Bushra Gameraddin 2016 [29]. The current study deduced that renal cysts evoked from the cortex were more common than pelvic cysts (70%:12%). The study by Abass 2018 [28] and Moawia Bushra Gameraddin 2016 [29] also have similar findings which reported renal cortex cysts had high incidence than para-pelvic cysts. The findings of the current study and previous studies were related to each other showing that the unilateral right kidney had more cysts and the cortex of the kidney is more involved in cyst development.

CONCLUSIONS

In conclusion, the prevalence of renal cyst is higher in old males specifically in the cortical region. Unilateral polycystic kidneys are most common and ultrasound is the best modality for the evaluation of renal cysts because it is a non-invasive, cheap, and easily available.

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