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Cystic Kidney Diseases: Clinical Presentation and Ultrasound Characteristics in Guinea

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Abstract

Introduction: The aim of our study was to describe the clinical presentation and ultrasonographic features of renal cysts at the Donka National Hemodialysis Center. **Material and Methods:** This was a retrospective descriptive study covering a 13-year period from January 1, 2010 to December 31, 2022. All patients whose renal ultrasonography showed the presence of unilateral or bilateral renal cysts of any number and size were included in our study. Our variables were epidemiological, clinical and ultrasonographic. **Results:** The frequency of renal cysts was 1.8% in our department. The mean age of patients was 52 ± 14 years, with extremes of 26 and 77 years. The male sex was the most represented with 54.7%. Physical asthenia was the most common symptom (53.3%). Polycystic kidney disease (PKD) was the most common renal disease (53.3%). Kidneys were enlarged in 53.3% of cases. Localization was cortical in 93.3% of cases, and cyst contents were liquid in most patients (97.3%). **Conclusion:** Our study shows that renal cysts are less frequent in our department. Further studies are needed to understand the unexplored aspects of renal cystic disease, with the aim of improving knowledge on this subject.

Keywords

Clinical, Guinea Conakry Renal Cysts, Ultrasonographic Features

1. Introduction

Renal cysts are generally thin-walled, epithelial-lined, spherical, fluid-filled structures that can be found anywhere along the nephron [1]. Renal cysts can be focal or diffuse and unilateral or bilateral. In children, most renal cysts are due to hereditary or acquired cystic diseases, unlike in adults [2]. Cyst development begins

early in life, and macroscopic cysts can be detected in childhood [3]. Although certain hypotheses exist concerning the pathogenesis of renal cysts, their etiology is not fully understood [4]-[7]. The majority of simple cysts have no associated clinical symptoms [1]. However, some cysts tend to grow, causing symptoms such as pain, hematuria and/or urinary obstruction [5]. Cyst growth displaces and destroys normal renal tissue, resulting in fibrosis, renal architectural derangement and ultimately renal failure [8] [9]. Renal ultrasonography is the first-line diagnostic tool and is informative in many cases [2] [3] [10] [11]. It allows detailed visualization of the renal parenchyma and the number, size and location of cysts, thus representing the most important diagnostic imaging technique for the initial diagnosis of renal cysts [12]. It is an inexpensive, non-invasive examination method that is particularly suitable for children, and the procedure does not require sedation or ionizing radiation [3]. In Asia, Choi JD in 2016, in his study of the clinical features and long-term observation of simple renal cysts in a healthy Korean population had reported a prevalence of ultrasound-detected simple renal cysts of 5.4% [7].

In the USA, Karmazyn B *et al.* in 2015, in their study on the ultrasound classification of solitary renal cysts in children at Indiana University had reported a 1% prevalence of solitary renal cysts in children [11].

In Europe, Willey CJ *et al.* in 2017, in their study of the prevalence of autosomal dominant polycystic kidney disease in the European Union, reported a prevalence of 3.96/10,000 inhabitants [8]. In Africa, Awoonidanla OP *et al.* in 2014, in their study entitled: prevalence and clinical presentation of cystic kidney disease in Lagos had reported a prevalence of cystic kidney disease of 2.4% [13].

In Guinea, to our knowledge, no study reporting relative data on this subject has been carried out.

Thus, the complications of cysts on renal function, the importance of renal ultrasound in the diagnosis of renal cysts and the absence of previous studies on this subject in the Republic of Guinea motivated the choice of this topic. The aim of our study was to describe the clinical presentation and ultrasonographic features of renal cysts at the Donka National Hemodialysis Center.

2. Patients and Methods

This was a retrospective descriptive study covering a 13-year period from January 1, 2010 to December 31, 2022.

Our study population was all patients diagnosed with renal cysts during the study period. Target population: patients hospitalized during the period who had ultrasound results in their medical records.

Study population: any medical record in which the ultrasound result showed at least one renal cyst.

Selection criteria:

All patients whose renal ultrasound showed the presence of unilateral or bilateral renal cysts, regardless of their number or size, were included in our study.

Not included

- Patients referred for other pathologies in whom the ultrasound scan did not show a renal cyst.
- Incompletely completed files.

Sampling:

We carried out an exhaustive recruitment of all files meeting the selection criteria during our study period.

Data collection techniques and procedures

To collect data, we examined all the files in the department concerned by the study period in order to extract those of interest to the study.

Renal cyst characteristics on renal ultrasound:

- Lateral: the affected kidney;

It may be the right kidney, the left kidney or both kidneys (bilateral).

- Number of cysts: the number of cysts on the kidney(s). There may be a single cyst (solitary) or several cysts (multiple).
- Location on the kidney: the structure of the kidney in which the cyst is located. This may be the upper, middle, lower or parapelvic pole.
- Cyst content: it may be clear, etc.
- Presence of nodule: this may or may not be a nodulated cyst.
- Movable cystic calculi: may or may not be present.

Data analysis

Data were collected on pre-established survey forms, entered using SPSS (Statistical Package for Social Science) software version 21.0.0.0 for statistical analysis. Our results were presented using Pack Office 2019 software. Qualitative variables were presented as proportions and quantitative variables as averages.

3. Results

Of the 4100 cases collected, cystic disease was diagnosed in 75 patients with an average age of 52 ± 14 years (Table 1).

Table 1. Distribution of patients by socio-demographic characteristics.

Variables	Workforce	%
Frequency		
Cystic kidney disease	75	1.8
Other pathologies	4025	98.2
Age (years)	**Mean age: 52 ± 14 years**	**Years Extremes: 26 - 77 years**
21 - 40	19	25.33
41 - 60	39	52
61 et plus	17	22.67
	Gender sex-ratio = 1.2	
Male	41	54.7
Female	34	45.3

The circumstances in which cystic disease was discovered were mainly on the occasion of a complication such as chronic renal failure, and fortuitous discovery in over 22% of cases (Table 2).

Table 2. Distribution of patients by clinical signs.

Variables	Workforce	%
Functional signs		
Physical asthenia	40	53.33
Headache	40	53.33
Anorexia	30	40
Lumbar pain	25	33.33
Nausea/Vomiting	22	29.33
Weight loss	22	29.33
Fever	22	29.33
Dyspnea	14	18.66
Vertigo	14	18.66
Physical signs		
Lumbar contact	35	46.66
Abdominal distension	20	26.66
Large kidneys	10	13.33
Large liver	17	22.66
Turgidity of jugular veins	17	22.66

Cysts were multiple in 53% of cases, mainly cortical in location, and bilateral (Table 3).

Table 3. Distribution of patients by ultrasound characteristics of renal cysts.

Variables	Workforce	%
Nature of cysts		
Polycystic kidney disease	40	53.3
Simple cysts	35	46.7
Cyst volume		
Normal	35	46.7
Increased	40	53.3
Renal location of cysts		
Cortical	70	93.3
Medullary	5	6.7

Continued

Cyst content		
Liquid	73	97.3
Mixed	2	2.7
Laterality		
Left unilateral	20	26.66
Unilateral right	10	13.33
Bilateral	45	60

4. Discussion

In our study, we obtained 75 cases out of 4100 inpatient records, *i.e.* a frequency of 1.8%. This result is close to that reported by Awoonidanla OP *et al.* in Nigeria in 2014 [13], who reported a frequency of 2.4%, but lower than the results reported by Mensel B *et al.* [4] in Germany in 2018 and Choi JD [7] in Korea in 2016, who found a frequency of 27% and 5.4%. This difference in frequency observed in our study could be explained by our sample size.

The mean age in our study was 52 ± 14 years, with extremes of 26 and 77 years. The 41 to 60 age group was the most represented at 52%. Mensel B *et al.* [4] in Germany in 2018 found a similar mean age of 51 years. But Choi JD [7] in Korea in 2016 found a lower result at 47.1 years. This result could be explained by the fact that age is the most important determinant of renal cyst growth rates [14] [15].

In our study, we found that the male sex was the most represented at 54.7% with a sex ratio of 1.20. Our result is similar to that found by Mensel B *et al.* [4] in Germany in 2018, who noted a male predominance of 34%, but different from that of Awoonidanla OP *et al.* in Nigeria in 2014 [13], who found a female predominance with a sex ratio (M/F) of 1/1.2. These results are justified by the fact that cystic kidney disease is not gender-specific. It affects both sexes without exception, which is consistent with the literature.

Renal cysts were discovered during investigations for chronic renal failure (46.7%). In relation to clinical signs, lumbar pain (26.7%) and macroscopic hematuria were observed. Lumbar contact was positive in over 40% of patients. Our findings may be explained by patients' lack of awareness of the disease. This would lead them to consult a specialist at an advanced stage of renal failure.

According to the number of cysts observed, multiple cysts were the most common at 53.3% and single renal cysts at 46.7%. This result is similar to the finding of Awoonidanla OP *et al.* [13] in Nigeria in 2014 in their study, who had a predominance of polycystic kidney disease of 48.6% followed by simple renal cysts in 45.9%. This result could be explained by the fact that polycystic kidney disease is the most common hereditary nephropathy characterized by the development of multiple renal cysts.

In our study, according to abdominal ultrasound findings, kidney volume was

increased in our patients in most cases, *i.e.* 53.3%. This result is similar to that of Kane Y *et al.* [16] in Senegal in 2019, who in their study reported that almost all patients had increased kidney volume on renal ultrasound during autosomal dominant polycystic kidney disease. Our result could be explained by the fact that renal cysts increase in size progressively during autosomal dominant polycystic kidney disease, thus promoting renal hypertrophy.

In our study, bilateral renal cysts accounted for 60% of patients, and unilateral renal cysts for 40%. Of the 40% of simple renal cysts, the right kidney accounted for 26.7% of unilateral involvement and the left kidney for 13.3%. Our result differs from that of Bora O *et al.* in Türkiye in 2016 [1], who reported in their study that left kidney involvement was most represented in simple renal cysts with a proportion of 49.4%.

Concerning the location of renal cysts, we found that in the majority of cases, renal cysts occupied the renal cortex with a proportion of 93.3% followed by the medullary part in 6.7% of cases. This result differs from that found by Bora O *et al.* in Türkiye in 2016 [1], who reported in their study that in the majority of cases the medulla was the site most affected by simple renal cysts, *i.e.* 52.8%. Our result could be explained by the important role of the cortex in overall kidney function.

According to the content of renal cysts on renal ultrasonography, we found a fluid continuum in the majority of cases, with a proportion of 97.3%, followed by a mixed content in 2.7%. This result is similar to that found by Kane Y *et al.* [16] in Senegal in 2019, who reported in their study a fluid continuum of renal cysts in the majority of cases with a proportion of 96%. Our result corroborates with data in the literature, which describes the liquid content of cysts as the most frequently found in cystic kidney disease.

5. Conclusion

The frequency of renal cysts is relatively low in Guinea, and their clinical manifestations are often non-specific. Ultrasound was essential for the diagnosis of renal cysts. Most patients showed renal hypertrophy and bilateral, cortical cysts. Autosomal dominant polycystic kidney disease was the most frequently diagnosed cystic disease. We suggest that further studies be carried out, to understand the unexplored aspects of cystic kidney disease with the aim of improving knowledge on this subject.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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