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Acquired cystic renal disease in hemodialysis patients.

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ABSTRACT… Objectives: The objective of this study was to determine the frequency of Acquired cystic renal disease in patients on hemodialysis. **Study Design:** Cross Sectional study. **Setting:** Bahawal Victoria Hospital, Bahawalpur-Pakistan. **Period:** Jan 2019 to June 2019. **Material & Methods:** Patients on maintenance hemodialysis were evaluated using ultrasound for acquired cystic renal disease. **Results:** The study included 220 patients who were on maintenance hemodialysis. The male to female ratio was 2.01:1. Most common causes of renal failure were Diabetes Mellitus and Renal stone Disease (22.3%) each. Acquired cystic renal disease was found in 45 (20.5%). The difference of frequency of acquired cystic renal disease was statistically significant in age groups & anemia. **Conclusions:** Acquired cystic renal disease is common complication of End stage renal disease and maintenance hemodialysis. Regular monitoring with ultrasound needs to be done for those patients who are on maintenance hemodialysis for more than 3 years.

Key words: Acquired Cystic Renal Disease, Chronic Kidney Disease, Hemodialysis.

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INTRODUCTION

Renal replacement therapy (hemodialysis, peritoneal dialysis, renal transplantation) is now opted by huge number of patients suffering from end stage renal disease. It not only imposes economic but also social burden on country wide health plans.[1] different complications of end stage renal disease include anemia, hypertension, fluid over load, bone mineral disease, acidosis are commonly seen in practice but Acquired cystic renal disease is also known complication. In this entity, patient develops numerous fluid filled cysts in the kidney while having no prior history or diagnosis of hereditary cystic disease of kidney.[1]

It is necessary to distinguish from adult polycystic kidney disease from Acquired cystic renal disease. In Acquired cystic renal disease there is no family history and there is no cyst formation in other organs of body as in APKD and their size ranges from normal to small in size which is contrary to APKD.[2-4]

The symptoms of Acquired cystic renal disease range from being asymptomatic to having hematuria, lumbar pain and recurrent urinary tract infections. These cysts are also associated with development of renal cell carcinoma with distant metastasis.[5,6] Therefore it is necessary to make its early diagnosis.

OBJECTIVE

The objective of this study was to determine the frequency of Acquired cystic renal disease in patients on hemodialysis at Bahawal Victoria Hospital, Bahawalpur, Pakistan.

MATERIAL & METHODS

This cross-sectional study was conducted from Jan 2019 to June 2019 at Dialysis Unit, Bahawal Victoria Hospital, Bahawalpur. Patients of age more than 18 years of either gender were included in the study. Patients having APKD, Medullary cystic disease of kidney and who refused to give consent were excluded from the study.

Data was collected with pre-designed pre-tested questionnaire. Renal Ultrasonography was performed by same radiologist.

SPSS v.23.0 was used to analyze data. Frequencies and percentages were calculated for qualitative variables. Mean and standard deviation were calculated for quantitative variables. Effect modifiers were controlled through stratification. Post stratification chi-square test was applied by taking $p=<0.05$.

RESULTS

Out of 260 patients registered for maintenance hemodialysis 220 were included in the study. 25 patients had APKD and 15 refused to give consent.

There were 147 (66.8%) male and 73 (33.2%) female with male to female ratio 2.01:1. 17(7.7%) had history of smoking. The most common causes of renal failure were Diabetes Mellitus (22.3%) & Renal stone disease (22.3%) (Figure-1). Acquired cystic disease was found in 45 (20.5%) (Figure-2). 9 (4.1%) were HBsAg reactive and 110 (50%) were anti-HCV reactive patients (Figure-3). Most of patients belonged to age group 26-50 years 118 (53.6%) & duration of hemodialysis for one to two years 84 (38.2%). Anemia was present in 105 (47.7%) and low serum albumin was present in 49(22.3%).

The difference of frequency of acquired cystic disease was statistically significant in age groups & anemia (Table-I & II). No statistical significance was found in gender, history of smoking, cause of renal failure, HBsAg, anti-HCV, duration of hemodialysis and low serum albumin.

Mean age of patients were 42.16 ± 14.921, duration of dialysis was 27.39 ± 25.6 months, hemoglobin was 10.127 ± 2.26 g/dl and serum albumin was 4.69 ± 11.89 (Table-III).

		Age Groups			Total	P-Value
		Less than 26 years	26-50 years	More than 50 years		
Acquired cystic renal disease	No	35	93	47	175	0.008
	Yes	1	25	19	45	
Total		36	118	66	220	

Table-I. Frequency of acquired cystic renal disease in different age groups

		Anemia		Total	P-Value
		Yes	No		
Acquired cystic renal disease	No	90	85	175	0.03
	Yes	15	30	45	
Total		105	115	220	

Table-II. Frequency of acquired cystic renal disease in anemia

	Age (in years)	Duration of Hemodialysis (in months)	Hemoglobin (g/dl)	Serum Albumin (g/dl)
Mean	42.16	27.39	10.127	4.696
Std. Deviation	14.921	25.600	2.2652	11.8997

Table-III. Mean and standard deviation of quantitative variables

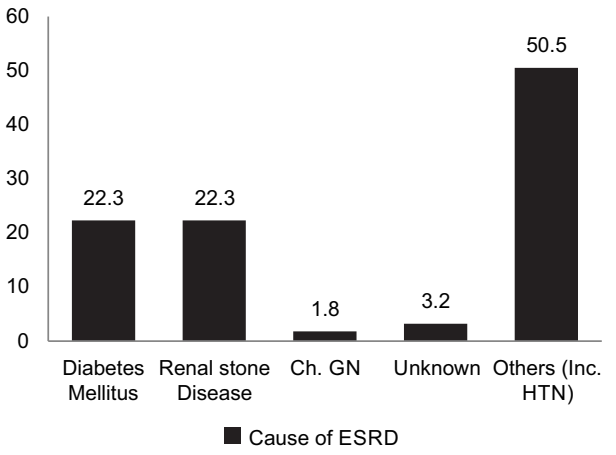

Figure-1. Cause of renal failure (in percentages)

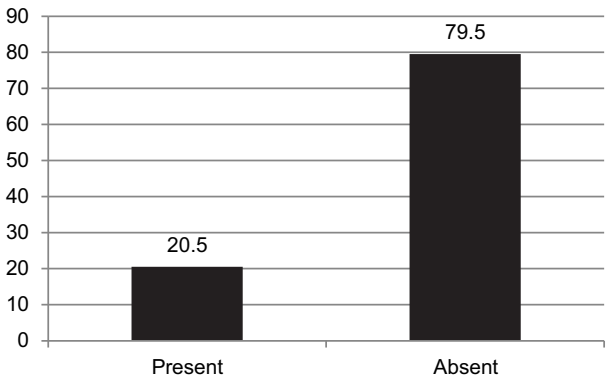

Figure-2. Acquired cystic renal disease

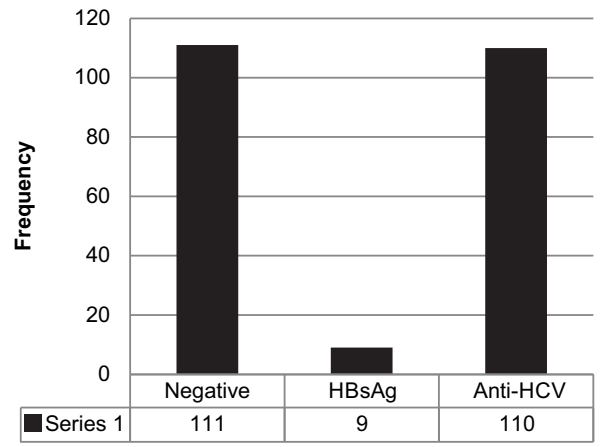

Figure-3. Viral marker status of patients

DISCUSSION

Acquire cystic renal disease was first described by Dunhill and co-worker while doing autopsy on patients who had end stage renal disease.[7] After that many studies have been performed to know its prevalence, pattern and complications.[8-10] In this study its prevalence was 20.5% which is similar to different studies conducted in different parts of world. For example studies conducted in West Africa, Jordan and Pakistan had frequency of Acquired cystic renal disease in hemodialysis patients as 31%, 22%, 10%.[11,12] However different studies used different diagnostic approaches like CT scan, Histopathology of nephrectomy samples and autopsy of patients after their death. However these diagnostic tools cannot be used as screening method for Acquired cystic renal disease in patients.

In different studies acquire cystic disease of kidney has more prevalence in males than in females. This can be explained by effect of testosterone on increasing tubular hyperplasia and cyst formation.[11,13] In this study there was no statistical difference in prevalence of this condition among males and females. A cohort study done by Gnionsahe also revealed the same results.[10]

The prevalence of Acquired cystic renal disease increase with increase in duration of hemodialysis as demonstrated in different studies. Patients having duration of hemodialysis for more than 3 years had increased prevalence of this condition than others.[13,14] These studies suggest that duration of hemodialysis and kidney failure can be risk factors for this condition in adults and children.[15] However there was no statistical significance was noted in this study.

No statistical significance was seen regarding the prevalence of this condition and cause of renal failure in the patients. Similar observations were also showed by other authors regarding this subject.[11,16]

CONCLUSION

Regardless of etiology of end stage renal disease, Acquired cystic renal disease is common complication of hemodialysis and its prevalence increases with duration of hemodialysis. Having risk of renal cell carcinoma this condition needs to be looked for regularly by ultrasound in patient who are having hemodialysis for more than 3 years.

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Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
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2	Raheel Khan	Conception & design, acquisition of data, analysis & interpretation of data, Drafting the article.	
3	Muhammad Yousuf	Drafting the article, Revising it critically for important intellectual content.	
4	Muhammad Imran	Drafting the article, Revising it critically for important intellectual content.	
5	Yusra Saeed	Conception & design, acquisition of data, analysis & interpretation of data, Drafting the article.	
6	Muhammad Ahmad	Conception & design, acquisition of data, analysis & interpretation of data, Drafting the article.