

Study of the Kidney Morphological Changes in Long Standing Hemodialysis Patinents in Sinnar State Sudan

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Abstract:

Introduction: *Cystic changes and neoplastic transformation in native kidneys of end stage renal disease patients are not uncommon, Regular follow up with ultrasound machine is useful for prediction of this complication. The aim of this study is to look at morphological changes and neoplastic transformation in both native, non- functioning kidneys of hemodialysis patients which can occur, and still remain the main question.*

Material and Methods: *Between January2014- to October 2014 in Sennar teaching hospital the study has been done, The data were collected from 50 cases under regular hemodialysis for 5 years or more, All the patients are of adult age and more than 15 years old, without history of congenital adult poly cystic kidney disease, and ultrasound exclude cystic disease as cause of end stage kidney disease at start of dialysis.*

Results: *Transformation of the kidneys to the cystic structure occur in 60% of the patients, This change is not seen in patients above 60 years old, No neoplastic transformation changes has been detected.*

Conclusion: *In contrast to European countries studies, this study shows no neoplastic changes among Sudanese patients on chronic hemodialysis. So no need for surgical intervention to remove non function, non-harmful native kidneys.*

Key words: L1: kidney morphological changes, long standing hemodialysis patients, Sinnar State Sudan

INTRODUCTION:

The hemodialysis nowadays is becoming light guide in the darkness of end stage renal disease (ESRD) to patient who cannot undergo renal transplantation. It gives them new hope in life under extreme conditions. The life span of end stage kidney disease patients has become prolonged, so they are liable to many complications because of their chronic illness and the complications of hemodialysis, Long term complications of hemodialysis include amyloidosis, neuropathy and various forms of heart disease. Increasing the frequency and length of treatments has been shown to improve fluid overload and enlargement of the heart that is commonly seen in such patients (Arthur. C. Guyton, 2006)

ACQUIRED [DIALYSIS-ASSOCIATED] CYSTIC DISEASE

The kidneys from patients with end stage renal disease that have under gone prolonged dialysis for some time exhibit numerous cortical and medullary cysts. The cyst measure 0.5to 2 cm in diameter, contain clear fluid, and are lined by either hyper plastic or flattened tubular epithelium, and often contain calcium oxalate crystals. They are probably formed as a result of obstruction of tubule by interstitial fibrosis or by oxalate crystal.

The acquired cystic kidney disease had been studied previously by Taylor who stated that the acquired cystic kidney disease (5 or more cysts per kidney) was identified in 59% of kidneys by use of computed tomography and in 18% by use of sonography (Taylor et al., 1989).

Most of them are asymptomatic. But sometimes the cyst bleed, causing hematuria. The most of them ominous complication is development of renal cell carcinoma in the walls

of these cysts, occurring in 7% of dialyzed patients observed for 10 years (Hada, R.2009).

MATERIAL AND METHODS

Between January 2014 and October 2014 in Sinnar teaching hospital the study has been done, the data is collected from 50 cases under regular hemodialysis for 5 years or more, all patient adult age more than 15years old, without history of congenital adult poly cystic kidney disease, and ultrasound exclude cystic disease as cause of end stage renal disease at start of dialysis. All data collected using questioner includes patient personal data plus ultrasound finding using statistical package for social science(SPSS) program for analysis.

THE PROBLEM:

This study tried to touch hemodialysis complications and predicts any other complication, and which is best to remove or to keep native nonfunctioning kidney.

OBJECTIVE:

The objective of this research is to study the morphological changes in kidneys of long standing hemodialysis patients by using U/S.

RESULTS

Table 1 The gender and their frequency

sex	Frequency	%
male	26	52
female	24	48
Total	50	100

Table 2 Cystic Change Percentage per Total Patients

Cystic change	Frequency	%
present	30	60
absent	20	40
Total	50	100

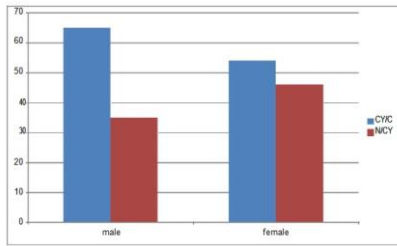


Figure 1 Frequency and Percentage of Cystic Change According Sex

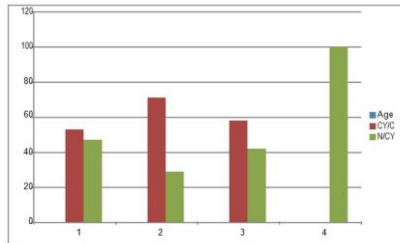


Figure 2 Shows Cystic Change For Age.

Table 3: Crosstabulation Sex * Cystic Change Crosstabulation

sex		Cystic change		Total	P-value
		present	absent		
male	Count	13	13	26	0.133
	% within sex	50	50	100	
	% of Total	26	26	52	
female	Count	17	7	24	
	% within sex	71	29	100	
	% of Total	34	14	48	
Total	Count	30	20	50	
	% within sex	60	40	100	
	% of Total	60	40	100	

When reading this table we are interested in the results of the Continuity correction. We can see here p-value= 0.0.133. This

tells us that there is no statistically significant association between sex and Cystic change. That is, all sex equal for Cystic change present vs. absent. We can accept the null hypothesis, and say that sex and Cystic change are not related.

Table 4 The CrossTabulation: Age Group * Cystic Change

AGEGRO UP		Cystic change		Total	P-value
		present	absent		
15-30	Count	13	2	15	0.0327
	% within AGEGROUP	87	13	100	
	% of Total	26	4	30	
31-45	Count	6	8	14	
	% within AGEGROUP	43	57	100	
	% of Total	12	16	28	
46-60	Count	9	10	19	
	% within AGEGROUP	47	53	100	
	% of Total	18	20	38	
>60	Count	2	0	2	
	% within AGEGROUP	100	0	100	
	% of Total	4	0	4	
Total	Count	30	20	50	
	% within AGEGROUP	60	40	100	
	% of Total	60	40	100	

When reading this table we are interested in the results of the Continuity correction. We can see here p- value=0.796. This tells us that there is no statistically significant association between Age group and Cystic change. That is, all Age groups are equal for Cystic change absent vs. present. We can accept the null hypothesis, and say that age group and cystic change are not related.

DISCUSSION

The study has been conducted in renal center in Sinnar teaching hospital, on 50 patients on hemodialysis for 5years or more, 52% of them are male and 48% were female (table 1).

Table 2 showed that 60% of the cases developed cystic change and 40% no cystic change detected, this is more than the finding of Hughson (Hughson et al., 1986) who found that 35% of patients on long dialysis showed cystic changes, and also over the finding of Taylor (Taylor et al., 1989) who stated that 18% of patients on five years dialysis show cystic change by sonography and match with his finding in computed tomography which 59% and this revealed how sonography improved in diagnosis of these cases. On other hand this percentage is less than the finding of Ishikawa (Ishikawa et al., 1991) who found that 43.5 % of patients on dialysis for less than 3 years and in 79.3% of patients who hand been on dialysis for more than 3 years and also less than the finding of E. Levine (Levine et al., 1991) they studied Kidneys of 30 patients on hemodialysis for 7 years they found that acquired cysts were seen in 87% of patients at the end of the study both studies were done by computed tomography. This revealed that although the sonography well improved still computed tomography is more sensitive in diagnosis these conditions, figure 1 clarified that 65% of male show this cystic change while only 54% of females show cystic change. In respect to age distribution the first group (15 to 30) 53% show cystic change while the second group (16 to 45) 71% of them show cystic change. The third group (46 to 60) 58% show this change. The last group 100% showed no cystic change they are only 2 patients this was appreciated in figure 2.

In cross tabulation between these cystic change and sex no relationship found (table 3), Also no relationship is found between this cystic change and age of patients (table 4), no masses or neoplasm transformation.

RECOMMENDATIONS:

After the enumeration of the results that are related to the following thesis, there are some ideas which could help further

in the field of the research and are better to be recommended as follow:

U/S could be used as routine checkup, follow up to help in the treatment of hemodialysis patients.

Closed flow up is very important to ESKD patients to detect the complications such as acquired renal cyst or malignant changes.

We need further research to detect changes that may occur in heart and parathyroid gland. We need more long duration, and more advanced techniques like CT, MRI, histopathology to find more accurate results.

CONCLUSIONS:

This study has been done in Sinnar Teaching Hospital for 50 ESKD patients on HD. Their ages are above 15 years (26 male, 24 female), Any patient with past history or family history of renal cystic disease is excluded.

The goal of the study is to evaluate the kidney in patient with chronic renal failure on regular HD by ultrasound finding regarding cystic and neoplastic transformation.

The results conclude that 60% of patients show cystic changes, No neoplastic changes.

Closed flow up is very important to detect any change that may occur in kidneys during long term HD, Further research is needed on the hearts and parathyroids of these patients, Lastly more advanced invasive and non-invasive technique.

REFERENCES

1. Aldrich, J. E. 2007. Basic physics of ultrasound imaging. Crit Care Med, 35, s131-7.

2. Drthur. C. Guton, M., John E . Hall 2006. Textbook of medical physiology, Philadelphia, Elsevier Saunders.
3. Hada, R. 2009. End stage renal disease and renal replace menttherapy—challenges and future prospective in Nepal. JNMA J Nepal Med Assoc, 48, 344-8.
4. Hughson, M.D., Buchwald & Fox, M. 1986. Renal neoplasia and acquired cystic Kidney disease in patients receiving long term dialysis. Arch pathol Lab Med, 110,592_601.
5. Ishikaawa, I. 1991. Uremic acquired renal cystic disease Natural history and complications. Nephron, 58,257-67 .
6. Levin, A., Hemmelgarn, B., Culleton, B., Tobe, S., Mcfarlane, P., Ruzicka, M., Burns, K., Manns, B., White, C., Madore, F., Moist, L., Klarenbach, S., Barrett, B., Foly, R., Jindal, K., Senior, P., Pannu, N., Shurraw, S., Akbari, A., Cohn, A., Reslerova, M., Deved, V., Mendelssohn, D., Nesralla, G., Kappel, J.& Tonelli, M .2008. Guidelines for the management of chronic Kidney disease. CMAJ, 179, 1154-62.
7. Levine, E., Slusher, S.L., Grantham, J.J. & Wetzal, L.H. 1991. Natural history of acquired renal cystic disease in dialysis patients: a prospective longitudinal CT study. AJR Am J Roentgenal, 156, 501-6.
8. Taylor, A. J., Cohen, E.P., Erickson, S.J., Olson, D.L. & Foly, W. D. 1989. RENAL imaging in long – term dialysis patients: a comparison of CT and sonography. AJR Am J Roentgenal, 153, 765 -7