

Aetiology of End-Stage Renal Disease among Adult Sudanese Patients
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Abstract:

Background: Very limited data are available public awareness for the causes of End Stage Renal Diseases (ESRD). Public awareness of the cause of (ESRD) helps both the nephrologists, patients and their families to anticipate problems during renal replacement therapy and helps to plan preventive measures for the community.

Objectives: To find out the major preventable causes of ESRD among adult Sudanese patients on regular haemodialysis (HD) at three haemodialysis centres.

Patients and methods: This is a prospective, descriptive study. Diabetes, hypertension and history of urinary tract obstruction were taken to determine the causes of ESRD. Interventions like renal biopsies were not taken and cases like nephritis are labelled as others.

Results: The population examined was one hundred patients on regular HD. We found that the leading cause of ESRD were hypertension in 43, diabetes mellitus in 18 obstructive uropathy in two and other causes (nephritis) in 37 patients.

Conclusion: Hypertension, diabetes mellitus, and obstructive uropathy are the major noncommunicable preventable diseases that cause ESRD.

Key words: Sudan, ESRD, haemodialysis

Sudan has witnessed in the last decade expansion of renal services both in the capital and regional hospitals. Yet the deficit in needs remain high and the demand for transplantation services is even higher. The incidence of end-stage renal disease (ESRD) is not known but it is estimated that more than 300 per million populations worldwide are affected due to the high prevalence of communicable diseases and the recognized rise in non-communicable diseases namely diabetes mellitus and hypertension¹. Few data in literature are available on the causes of renal diseases in Sudan². Over 1.1 million patients are estimated to have ESRD worldwide, with an addition of 7% new cases every year. In USA, the incidence and prevalence counts are expected to increase from 2000 to 2015 by 44 and 85%, respectively. There the incidence and

prevalence rates per million inhabitants are 32 and 70³. An average incidence of ESRD in the Middle East is 93 per million populations⁴. The estimated incidence for new cases in Sudan is about 70-140/million inhabitants/year⁵. The objective: to find out the main preventable noncommunicable causes of renal failure in the Sudan

Patients and methods:

Prospective descriptive study was designed in which questionnaires were fill by the research group. Questions were mainly on diabetes mellitus, hypertension, long standing history of urinary obstruction (calculi, prostatic disease, and urethral stricture). Data was collected after obtaining verbal consent from patients on regular haemodialysis (HD) at three centres. The population examined consisted of 100 ESRD patients on regular HD at the Omdurman Teaching Hospital, Asia Private Hospital and El -Bugaa Private Centre for Renal Diseases.

Inclusion criteria

Adult patients suffering of ESRD and on regular HD at the above mentioned centres for renal disease.

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Exclusion criteria:

Children younger than 15 years of age.

Statistical analysis:

Data were analyzed using SPSS 16.00. Simple statistics were then obtained

Results:

Information was obtained on 100 ESRD patients undergoing regular HD. They were 69 males and 31 female. The mean(±SD) age was 47.5 years (± 12.5). Table:1 shows the causes of ESRD.

Discussion:

The main causes of ESRD in the present study were hypertension, diabetes, obstructive uropathy. Elsharif² et al 2011 reported that the commonest cause of renal disease in Sudan was hypertension, while Osman et al⁶ and Abboud et al⁷ reported in 1987 and 1989, respectively, that the causes of most of the chronic kidney diseases (CKD) in Sudan are chronic glomerulonephritis and urinary calculi. Both studies were performed in Khartoum. However our findings are consistent with that reported by Osman et al⁸ as one-fifth of their patients in Sudan have controlled blood pressure.

Table 1:Frequency of causes among dialysis patients

Causes	Frequency	Percent
Hypertension	43	43%
Type 2 Diabetes Mellitus	18	18%
Obstructive uropathy	2	2%
Others & Unknown	37	37%
Total	100	100%

Also, our results are in keeping with the international literature as in Switzerland, where hypertensive nephropathy was the leading cause of ESRD⁹. Reports from Egypt^{10,11} estimated that the prevalence of hypertension was 26.3% in comparison with 24% reported from the United States^{10,12}

The leading noncommunicable causes in our study were hypertension), diabetic, and obstructive uropathy. In contrast, a study from

Netherlands found renal vascular disease in 20.4%) followed by diabetic nephropathy in 16.7% as the leading causes of ESRD¹³. Also, in Switzerland, hypertensive nephropathy was the leading cause of ESRD⁹. However, a study performed in southern India in 2006 that determined the aetiology of CKD by analyzing renal biopsies, showed that 70.5% had glomerulonephritis (GN) on histological diagnosis, 12% had interstitial nephritis and 6.6% had hypertensive arteriosclerosis¹⁴.

Elsharif et al, found that the leading known cause of ESRD for those who in the age group 40 to 60 years was hypertension, and but it was obstruction for those who were older than 60 years². Diabetes mellitus is a common cause of end-stage renal disease (ESRD) in the Arab world. In Saudi Arabia¹⁵, the prevalence of diabetes mellitus was estimated to be 25% and the incidence 45 %. Similar high prevalence rates have been reported from a number of Arab countries. For example, rates were found to be 46.8% in Lebanon¹⁶, 21.2% in Kuwait¹⁷, and 35% in Egypt¹⁸.

In some Arab countries, obstructive uropathy affected 40% of ESRD patients¹⁹. The two most common underlying causes were renal calculi⁷ and schistosomiasis¹¹. Reports on the nature of renal calculi in Arab countries are limited. However, the common type of the stones was reported as either urates or calcium oxalates²⁰. It is quite likely that the hot and humid climate is a primary reason for the high prevalence of calculi. Also, people may not drink as much fluid as they ought to. Nevertheless, high concentrated, small-volume, 24-hour urine output has been found in otherwise normal kidney donors²¹. Early referral of stone formers and eradication of schistosomiasis are crucial for prevention in this respect.

So, majority of the causes of acute renal failure that is seen in Arab countries are preventable. Diseases like malaria²² and renal stones are expected to be treated as early as [possible before undesirable complications arise. In Sudan, 12% of ESRD was reported to be due to renal calculi⁷. However, hair dye ingestion was reported to be a prominent

cause of acute renal failure²³. Public education, with regards to ingestion of such substances, is warranted. Aggressive campaigns to eradicate malaria, bilharzias and campaigns for health education on control of diabetes and hypertension are of paramount importance. Although kidney diseases are common in Arab countries, the opportunity for prevention is immense through: the use of media for public education; campaign of lifestyle changes to reduce diabetes mellitus; eradication programs against malaria and schistosomiasis; early referral and detection for renal stones; prevention and treatment of infants' dehydration; mobile screening clinics for hypertension; prenatal/postnatal screening for renal anomalies; genetic premarital counselling; pretransplant patient education and proper follow-up; strict application of not allowing drugs to be obtained from pharmacies without a doctor's prescription. It has been shown that lifestyle modification can cause a decrease in the number of persons that potentially develop diabetes mellitus. This occurs mainly because of weight reduction.

Conclusion:

Hypertension, diabetes mellitus, and obstructive uropathy are the major noncommunicable preventable diseases that cause ESRD. Public health education may play a good role in reducing the number of affected patients and hence the workload on the renal units.

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