

## Review of Renal failure in Gadarif state

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### Abstract

### Background

Renal failure is a remarkable health problem in Sudan that requires an effort to increase the awareness among medical professionals as well as public awareness.

This study was conducted to identify the causes of renal failure in Gadarif state.

### Methods

This is a cross-sectional descriptive study included all patients undergoing haemodialysis in Haider dialysis center in Gadarif state. Data were collected via a predesigned questionnaire filled from the medical records, directly from the patients and clinical assessment.

### Results

Hypertension was found to be the major cause of end stage renal disease (40%) followed by glomerulonephritis (20%),diabetes(14%). 22% of patient have no identified cause. 50% of acute renal failure are due to prerenal cause . 45% of long term complications of haemodialysis were cardiac diseases; ischaemic heart disease(IHD)and heart failure . Hypotension was the major acute complication (40%) of haemodiaysis. Delay renal transplantation was due to lack of donors in 55% of patients.

## Conclusion

Hypertension was the major cause of ESRD in Gadarif state. Long term haemodialysis without an obvious plan or hope of kidney transplantation results in serious complications like IHD and heart failure.

**Keywords:** Renal failure, end- stage renal disease, Sudan.

### مستخلص

الفشل الكلوي من الأمراض ذات الأهمية الصحية الملحوظة في السودان والتي تتطلب مجهود لزيادة الوعي لممارسي المهن الطبية وكذلك بين عامة الناس. أجريت هذه الدراسة لتحديد أسباب الفشل الكلوي في ولاية القضارف.

### الطرق :

هذه الدراسة دراسة وصفية تضمنت كل المرضى الذين أجروا غسيل الكلى الدموي بمركز غسيل الكلى بولاية القضارف. تم جمع المعلومات بواسطة إستبيان أعد مسبقاً، مُلي من السجلات الطبية مع الاستعانة المباشرة من المرضى بالإضافة لإجراء الكشف طبي.

### النتائج :

وجد أن إرتفاع ضغط الدم المسبب الرئيسي للفشل الكلوي المزمن بنسبة 40% يليه إلتهاب الكبيبات 20% ثم السكري 14%، كما أن 22% من الحالات لا يوجد لها سبب واضح، و50% من حالات الفشل الكلوي الحاد بسبب نقص الإمداد الدموي للكلى، 45% من المضاعفات المزمنة للغسيل الكلوي المستمر للغسيل الكلوي تمثلها أمراض القلب تحديداً أمراض الشرايين والفشل القلبي. هبوط ضغط الدم يمثل أكثر المضاعفات المصاحبة للغسيل الكلوي 40%. تأخر زراعة الكلى يسببه في المقام الأول عدم الحصول على المتبرع (55%).

### الخاتمة :

إرتفاع ضغط الدم يعتبر المسبب الرئيسي للفشل الكلوي المزمن في ولاية القضارف. الغسيل الكلوي المستمر بدون رؤية واضحة لإجراء زراعة الكلى ينتج عنه مضاعفات خطيرة مثل أمراض شرايين القلب والفشل القلبي.

## Introduction

Renal failure is a remarkably increasing health problem in Sudan that requires an effort to increase the awareness among medical professionals as well the public awareness. Renal failure is divided into two types; acute renal failure (acute kidney injury) and chronic renal failure (chronic kidney disease). Very limited data are available about the causes of renal diseases leading to chronic kidney disease in all states of Sudan <sup>(1)</sup>. Awareness of the causes of end-stage renal disease (ESRD) helps the nephrologists to anticipate problems during renal re-placement therapy and plan

preventive measures for the community. Over 1.1 million patients are estimated to have ESRD worldwide, with an addition of 7% annually. A cross-sectional study designed to determine the aetiology of ESRD among patients with ESRD on regular haemodialysis (HD) at Gezira Hospital for renal disease. This study was conducted in May 2009, the population examined consisted of 224 patients on regular haemodialysis in Gezira Hospital for renal disease. It was found that the aetiologies were dominated by unknown causes (53.57%). The leading cause of ESRD for those who were younger than 40 years was glomerular disease, hypertension for those between 40 and 60 years and obstructive uropathy for those who were older than 60 years<sup>(1)</sup>

A study of the clinical presentation and conceivable causes of chronic renal failure (CRF) in 61 Sudanese patients in Khartoum revealed that clinical features involved almost all the systems, however, gastrointestinal and cardiovascular signs and symptoms predominated. The causes of chronic renal failure in Sudan and Sweden are also studied for comparison. The causes of CRF in Sudan are chronic glomerulonephritis, obstructive nephropathy (stone disease), hypertension and diabetes mellitus in that order<sup>(2)</sup>.

In June 2009, there were 2858 patients on HD in Sudan, 122 patients on continuous ambulatory peritoneal dialysis (CAPD), and 1168 kidney transplant recipients. The overall prevalence of treated ESRD was 106 patients per million populations. Males constituted 66%, 67.7% and 79.5% and children constituted 3.9%, 25.3% and 6.6% of HD, CAPD and kidney transplant patients respectively. The commonest reported

cause of kidney failure was hypertension (26.1%), followed by diabetes mellitus (DM) (10.4%), obstructive uropathy (7.6%), glomerulonephritis (GN) (5.5%), polycystic kidney disease (2.6%), and pyelonephritis (1.1%)<sup>(3)</sup>.

Before we treat patients we should know what is wrong with them. And yet in adult registry data aetiology unknown is often the most common destination<sup>(4)</sup>. Apart from this there are many others in whom the diagnosis assigned is no more than an informed guess<sup>(5)</sup>. In 2003 Professor Barsoum published a review about the causes of ESRD in North Africa where interstitial nephritis responsible for 14-32%, glomerulonephritis 11-24%, diabetes 5-20%, nephrosclerosis 5-21%, polycystic and other hereditary less than 5%<sup>(6)</sup>. A study done in Iran (2009) revealed that in the under 40 age group the commonest cause of primary renal disease was unknown (25%) followed by hypertension (21%)<sup>(7)</sup>. Another one in Tunisia (2008) highlighted the fact that idiopathic chronic tubulointerstitial disease was common and varied from region to region<sup>(8)</sup>. In Yemen (2003) a study showed 58% of patients required dialysis were described as of unknown aetiology, non-had a diagnosis of glomerulonephritis and 25% were classified as post-renal cause<sup>(9)</sup>.

From the above mentioned review the aetiology of renal failure might be regarded as variable from region to region. Some definitions may be required focusing like:

<sup>(1)</sup>Diabetic nephropathy; not all renal failure in diabetic patients is owing to diabetic nephropathy. The term should be used for patients with significant proteinuria and evidence of other complications of diabetes (e.g. retinopathy) consistent with the likely duration of diabetes: long duration of diabetes before the onset of chronic renal

failure (usually more than 10 years) <sup>(10)</sup>. Over the age of 50 years, approximately 1 in 5 patients with non-diabetic renal disease will also be diabetic <sup>(11)</sup>. (2) Hypertensive nephropathy (HN); this is probably rare condition except in patients who have sub-Saharan African ethnicity. Patients can be classified as HN if a renal biopsy shows that the primary pathology is nephroangiosclerosis <sup>(12,13)</sup>. Essential hypertension in young white patients does not cause renal failure <sup>(14)</sup>. Two main issues will probably account for most genuine cases of unknown aetiology; firstly, patients who present late when biopsy may be too difficult, and secondly diseases that are still uncharacterized and therefore unknown in this part of the world <sup>(15,16)</sup>.

### **Objectives**

This study was conducted to identify the causes of renal failure in Gadarif state as the main objective, and to estimate some complications of the disease and its management.

### **Patients and methods**

This is a cross sectional descriptive study in which all patients (92) undergoing haemodialysis in Haider dialysis center in Gadarif city ( the only one center in the state) in the period from 20<sup>th</sup> of February to 8<sup>th</sup> of March 2014 were included in the study after verbal consents from the patients as well as the manager and the medical staff . Data were collected via a predesigned questionnaire filled from the medical records, directly from the patients and clinical assessment. Most of the patients are end stage renal disease patients with regular dialysis 2 to 3 sessions per week so the majority was covered within one week, but other patients diagnosed as acute renal

failure or newly established as ESRD underwent haemodialysis during the study period were also included in the study.

## **Results**

58% of the study population was male. 56% of patients came from rural areas. 96% of patients were diagnosed as ESRD and only 4% of them were cases of acute renal failure. Regarding initial presentation it was found to be uraemic symptoms in 52% of cases followed by pulmonary odema (20%), 18% accidentally detected with raised renal profile and 2% with pericarditis. 56% of the patient had an arterio-venous fistula (A-V) as an intravenous access for haemodialysis and temporal venous catheter was used for 14% of cases. 30% of patient on regular dialysis for more than 5 years, 22% for 2 to 3years, 22% for 1 to 2 years and 26% of less than 1 year duration including those with acute renal failure (4%). 45% of long term complications of haemodialysis were cardiac diseases; ischaemic heart disease (IHD) and heart failure. Hypotension was the major acute complication (40%) of haemodiaysis. 75% of the patients had no planning for kidney transplantation; 55% due to their lack of donors, 30% of them consider it expensive and 5% not convinced with transplantation ( considered it of no benefit).

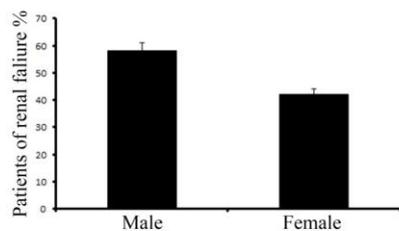
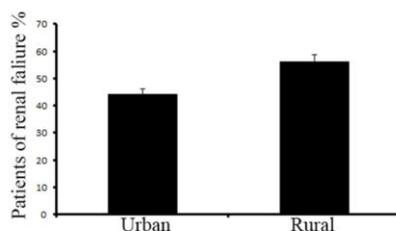


Fig (1):Patients gender distributions



Fig(2): Patients residence distribution

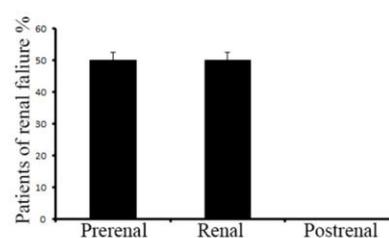


Fig (5):Etiology of ARF

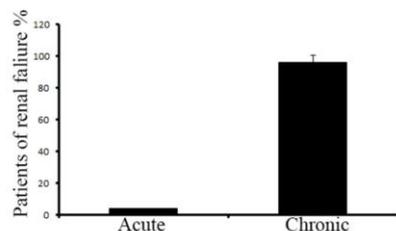


Fig (3):Types of renal failure

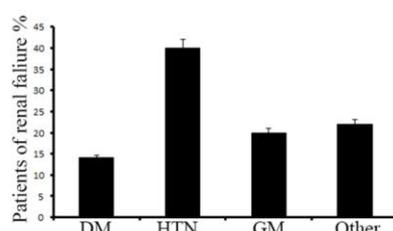


Fig (4): Etiology of ESRD

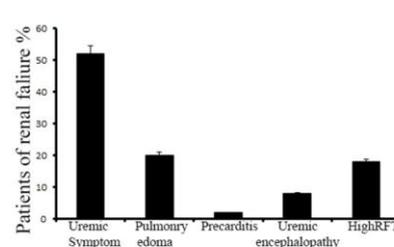


Fig (6): Presentation of symptoms

## Discussion

Although in the west hypertension is considered as a rare cause of end stage renal disease, hypertension in this study was found to be the main cause of ESRD and this is compatible with other studies in Sudan and Africa (17). In 2008 the association of renal failure was reported in this ethnic group (Africans), with polymorphisms of MYH9 gene coding non-muscle myosin heavy chain IIA, which is present on chromosome 22q11-12(18,19). I think this may be due to the difficulty in discrimination between hypertension as a complication of chronic renal failure and hypertension as a leading cause to it in some cases particularly in patients from rural areas who their presentation with renal area may be the first visit to doctor, because underlying renal disease can lead to malignant or accelerated hypertension, which can certainly result in rapid loss of remaining function, although in some studies done in West African this was regarded is not true in this ethnic group who do develop renal failure with hypertension and renal biopsy shows a conspicuous nephroangiosclerosis (20). Glomerulonephritis came as a second aetiological factor for ESRD which is

seems to be an overestimation because the diagnosis was mainly clinical (no renal biopsies were performed). No cause is identified in 22% of cases which is a considerable figure; this is going with a previous study in Sudan and neighbouring countries <sup>(18)</sup>. Probably due to the lack of advance investigations .Imaging with advanced renal failure routinely achieved by ultrasound, CT scan and MRI scanning should give useful information but there is very little published in renal imaging for identification of the aetiology of renal failure with the exception of analgesic nephropathy <sup>(21,22)</sup>. Cardiac diseases were the main long standing complications of haemodialysis which is compatible with literature review, this is obviously because our patients find it a real difficult to achieve the definite treatment for their disease, by which it mean kidney transplantation. Regarding acute complications of haemodialysis hypotension was the major one. Renal transplantation seems to be insensible in our patients being mainly due to lack of donor which is related to very low level of awareness particularly in the absence of the facility of kidney transplant in Gadarif.

### **Conclusion and recommendations**

This study was an initial exploration of renal failure as a health problem in Gadarif. Hypertension as regarded the main cause of EDRD in our patient, so increase awareness of early detection, proper management and follow up is needed. Availability of advance investigations that help in the diagnosis and management is of top concerns. Efforts to develop the dialysis center and to instruct more dialysis centers in the state should be considered. Long term haemodialysis without an

obvious plan or hope of kidney transplantation results in serious complications like IHD and heart failure. Moreover encouraging kidney transplantation is mandatory.

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