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## CAUSES OF END STAGE RENAL DISEASE IN BENHA, ALQALUOBIA GOVERNORATE, EGYPT

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### ABSTRACT

End-stage renal disease (ESRD) has become a worldwide health concern. No clear information is available about the causes of ESRD in ALQALUOBIA Governorate, Egypt. Awareness of the cause of ESRD will help in not only delayed the onset of haemodialysis; but may the management of some causes to prevent ESRD. This is a cross-sectional study designed to determine the etiology of ESRD under maintenance haemodialysis patients in Benha, Alqaluobia Governorate, Egypt; and was conducted between August 2015 and June 2017 on 500 patients. We founded that hypertension and diabetes mellitus are the most common causes in different age groups and unknown causes were 24% of all causes of ESRD; increased to 53.3% in patient group less than 40 years old.

### INTRODUCTION

ESRD is usually the result of slowly progressive kidney damage. Because of the asymptomatic nature of renal disease, kidney damage frequently remains undetected until late in the course (1).

Chronic kidney disease is a growing public health problem around the world. So it is important for all countries to prevent chronic kidney disease and its progression (2).

According to the United States Renal Data System 2014 Annual Data Report, which compared 54 countries, the United States does not fare well in terms of the prevalence of end-stage kidney disease, which was 1,976 per million population in 2012. But Taiwan and Japan fared even worse at 2,902 and 2,365, respectively (3). The number of newly reported ESRD cases in 2013 was 117,162; the unadjusted incidence rate was 363 per million/year. Up to 38% of incident ESRD cases in 2013 received little or no pre-ESRD nephrology care(4).

In developing countries such as Egypt, there is an increase in the prevalence and the incidence of ESRD, exerting a considerable burden on the health system. In the last statistics was performed, the prevalence was 483 per million population (5).

Awareness of the cause of CRF helps the nephrologists to anticipate problems during renal replacement therapy (RRT) and plan preventive measures for the community (6).

In our locality, Benha University hospital; Alqaluobia Governorate; Egypt, there are no peritoneal dialysis or transplant programmes and haemodialysis is the only mode of treatment for ESRD.

#### Patients and Methods

This is a cross-sectional study designed to determine the etiology of ESRD among patients with ESRD on regular haemodialysis at internal medicine department, Benha university hospital, Alqaluobia Governorate, Egypt. This study was conducted between August 2015and June 2017 on 500 patients including patients already on regular haemodialysis in Benha university haemodialysis unit, newly diagnosis ESRD and starting haemodialysis and others already on regular haemodialysis from other centres referred to our hospital asking for higher referral , and all the patients were over 18 years old.

Diagnosis of the cause of ESRD was obtained from the medical history which was obtained from patient's medical records and by direct interview. The diagnosis of hypertension as a cause of ESRD was made when there was long standing hypertension before the development of ESRD with no evidence suggestive of other diagnoses. The diagnosis of diabetic nephropathy (DN) was made when there was longstanding diabetes with proteinuria and associated diabetic retinopathy. Polycystic kidney was ultrasonography based and family history. Obstructive Uropathy was based on radiology and operative history. Primary glomerulonephritis (GN) was a biopsy proven diagnosis. The patients were divided according

to age of patients to less than 40 years, 40 to 60 years and more than 60 years.

For Statistical evaluation we used the statistical package of social science (SPSS, version 16, Chicago, USA) and Excel to perform the analysis. Quantitative data were expressed as mean  $\pm$  SD, whereas categorical data were expressed as numbers and percentages.

## RESULTS

The study included 500 patients; haemodialysis (HD) was the only RRT modality. The age was ranged from 19 to 77 years ( $51.73 \pm 12.36$ ). Males Vs. females were 59% vs. 41%.

209 patients was hepatitis C positive (41.8). Most common causes of ESRD among HD patients were Hypertension (34%) and diabetes mellitus (16.4%). The cause of CRF was unknown in 24% of our patients.

**Table 1** The etiology of ESRD among haemodialysis patients in Benha university hospital

Cause	Total (n=500) N (%)	<40years (n=90) N (%)	40-60 years (n=208) N (%)	>60years (n=202) N (%)
Hypertension	170 (34%)	12(13.4%)	72(34.6%)	86(42.6%)
Diabetes mellitus	82 (16.4%)	6(6.7%)	38(18.3%)	38(18.8%)
Obstructive Uropathy	58 (11.6%)	4(4.4%)	16(7.7%)	38(18.8%)
Infection	36 (7.2%)	10(11.1%)	22(10.6%)	4(1.9%)
Glomerulonephritis	22 (4.4%)	8(8.9%)	12(5.7%)	2(1%)
Polycystic kidney	12(2.4%)	2(2.2%)	4(1.9%)	6(3%)
Unknown	120 (24%)	48(53.3%)	44(21.2%)	28(13.9%)

## DISCUSSION

The incidence of ESRD requiring RRT is increasing and poses burden on healthcare budgets [7]. We do not have previous reports in our locality about the etiology of ESRD to compare with the others governorates in Egypt or other countries.

This work demonstrated that the prevalence of ESRD increased with ageing, the mean age of the patients was  $51.73 \pm 12.36$  years, and also showed that the prevalence of ESRD was higher in men than in women as the ratio was 59% males and 41% females. This results were in agreement with study was done in the El-Sharkia Governorate, Egypt (5), as they found that 62.2% patients males and 37.8% females and The mean age of the patients was  $52.03 \pm 14.67$  years. In the Menoufiya governorate, Egypt The mean age of the patients was 52 years.(8) In Kafer El-Shakh Governorate, Egypt(9), the mean age was 51 years.

The mean age of the ESRD patients in Egypt increased from 45.6 years in 1996 to 49.8 years in 2008 (10).The increasing mean age of the ESRD patients reflects the improvement of health care; but, we are still away from other developed countries as the mean age in the United State was 61.1 years(11) and the mean age in the United Kingdom was 65.9 years (12). But we are better than other developing countries as in Sudan; one study revealed the mean of age was 45.78 years (1)

The prevalence of hepatitis C in dialysis patients showed wide variations worldwide. In Egypt it was estimated to be around 52.1 [10]. In this study, the prevalence of hepatitis C was 41.8 which was closer to the prevalence in Kafer El-Shakh Governorate, Egypt, which was 39.7% (9). The high prevalence of hepatitis C in the haemodialysis patients in Egypt is primary to the high prevalence of hepatitis C in the general population, other factor as repeated blood transfusion

in dialysis units to treat anaemia which aimed to decrease by iron therapy and erythropoietin.

In the current study, the main known cause of ESRD was hypertension (34%) followed by diabetes mellitus (16.4%) in different age groups. This was found in other Governorates in Egypt as: El-Sharkia Governorate, the main cause of ESRD was hypertension (29.7%), followed by diabetes mellitus (12.5%) (5); In Canal governorates, hypertension was the main cause of ESRD (27.3%), followed by diabetes mellitus (10.7%) (13); in the Minya governorate, the main cause was also hypertension (21%), followed by diabetes mellitus (13%)(13) and In Kafer El-Shakh Governorate, the cause of ESRD was hypertension (34%), followed by diabetes (14%)(9).

In Iran; hypertension and diabetes mellitus were the most common causes of ESRD, but GN and hypertension were the commonest causes of ESRD in Iran before and This change may be due to increasing prevalence of obesity, diabetes and hypertension in developing countries (14). In United States the incidence rate of ESRD with hypertension listed as the primary cause and increases with age. In contrast the incidence rates of ESRD with diabetes listed as the primary cause in age group above 75 years old more than group at 65-74 years old (4). In Gulf countries like Saudi Arabia the diabetes mellitus accounts for 25.2% as the second most common cause of ESRD following hypertension (30.4%) (15).

In this study, unknown causes were 24% of all causes of ESRD; increased to 53.3% in patient group less than 40 years old and decreased to 13.9% in patient group more than 60 years old. So more than the half of patients below 40 years old have no causes of ESRD which lead to more fun needed as they will have more haemodialysis duration as their life expectance will be longer than other groups. Uncertain etiology of ESRD was estimated to be 14.4% in Iran (14) and 19.9% in Saudi Arabia (15). Other Governorates in Egypt showed that the unknown causes were: 27% in the Minya governorate (14), 25.3% in the Kafer El-Shakh Governorate (9) and 17.7 % in El-Sharkia Governorate (5). In Comparing with developed countries like the United States in which unknown causes represent 3.7% (3), this wide difference reflecting the poor health care system in developing countries.

Obstructive uropathy was responsible for 11.6% of causes of ESRD as the third most common cause after hypertension and diabetes in all patients but it was more common at age group more than 60 years to be equal to diabetes as the second common causes. This was similar to: in the Minya governorate, Egypt as it was 11% (13) and in Sudan was 11% (4). But was less in in El-Sharkia Governorate, Egypt as it was 8.4 (5). It was about 1% in the United States (3) which still reflecting the poor health care system in developing countries in early diagnosis and treatment in all Obstructive uropathy conditions.

This study cleared that Infection was responsible for 7.2% of the cause of ESRD as a total, but increased to 11.1% in age group below 40 years old and 10.6% in 40 to 60 years old but decreased to 1.9 % in patients older than 60 years old; so more attention must give to infections to control it as a cause of ESRD in younger groups. This was agreed with study in El-Sharkia Governorate, Egypt as infections were responsible for 8.8% of the cause of ESRD (5), but we still far away from developed countries as in the United States it was 0.8 %(3)

In this study, glomerulonephritis constitutes 4.4% of the causes of ESRD. And other studies in Egypt showed: in the Kafer El-Shakh Governorate was 8.2% (9) and 3.7 % in El-Sharkia Governorate (5). In Sudan it was 9.8% (1) but in Nigeria, the predominant causes of CKD were chronic glomerulonephritis 34.2% (16). In our study incidence of glomerulonephritis was is high in below 40 years old (8.9) and marked decreased to 1% in group older than 60 years old. But all these results show decreased incidence of glomerulonephritis as a causes of ESRD in comparison to an old study conducted in Egypt, in which glomerulonephritis accounted for 16.6% of the causes of ESRD (17).

Polycystic kidney disease responsible for 2.4% of all causes ESRD. Almost the same results were obtained by one study conducted in Egypt showed that polycystic disease of the kidney is responsible for 4.3% of the cases of ESRD. (10)

In conclusion, patients with ESRD in Benha, Alqaluobia Governorate, Egypt, the mean age was  $51.73 \pm 12.36$  and it is more common in males than in females. Hypertension and diabetes are the most common causes of ESRD, other causes were different in incidence according to age group. 24% of patients still of unknown etiology which needs improvement of health services. More implication of iron therapy and erythropoietin instead of blood transfusion in dialysis units will decrease the prevalence of hepatitis C in dialysis patients.

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