

Report

Renal replacement therapy in Egypt: first annual report of the Egyptian Society of Nephrology, 1996

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Introduction

Egypt is made up of 25 governorates which are classified into five groups. Cairo Governorate, which includes the capital, is both the most populous and the most urbanized part of Egypt. The other governorate groups are located in: lower Egypt near the Mediterranean sea, upper Egypt which is the southern part of the country, the canal governorates that are located by the Suez Canal, and the border governorates which are away from the Nile valley.

The epidemiology of end-stage renal disease (ESRD) in Egypt has never been examined on a national scale. Previous reports have shown that unknown causes of ESRD in Egypt have reached 33.6% [1]. Schistosomiasis, which is considered a common cause of renal failure in Egypt, is accused of being the cause of about 30% of chronic renal failure, most of which is due to obstructive uropathy and a small percentage is due to schistosomal nephritis [2]. About 15% of patients with hepatosplenic schistosomiasis develop schistosomal nephritis (immune-mediated glomerulonephritis) initiated by the schistosomal antigen and propagated by IgA [3]. The percentage of diabetic patients in the dialysis population was 8.4% in 1993 [4]. While data regarding

the prevalence of hypertensive nephrosclerosis in Egypt are inadequate, it is reported that one in four Egyptians is or will be hypertensive [5]. Chronic interstitial nephritis of unknown etiology is increasing [6].

The prevalence of dialysis patients is presumed to have increased from 10 per million population (PMP) in 1974 to about 165 PMP in 1995 [7,8]. Most patients are treated by haemodialysis while less than 10% are treated by intermittent peritoneal dialysis [8]. About 60 patients per million receive a renal transplant each year from living donors [9].

Subjects and methods

Centre and patient questionnaires were sent to all 370 identified dialysis centres in Egypt. The data requested included number of patients, age, sex, occupation, place of birth, past history of other diseases, renal biopsy results, dialysis frequency, modality of treatment, HBsAg, hepatitis C virus (HCV) and HIV status, cause of ESRD, blood transfusion and erythropoietin administration, renal transplantation and causes of death.

The data collected were analysed using SPSS.

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Results

Out of the 370 dialysis centres in Egypt, 124 responded (33.5%). The majority of dialysis centres in Egypt are private and there is no law that requires them to respond to questionnaires. The number of patients from the centres that responded was 4905, and the estimated number of patients with ESRD in Egypt is about 15 000 as shown in Table 1. Estimated prevalence of ESRD in

Egypt is 225 PMP. Most patients were undergoing intermittent haemodialysis treatment (97.1%), while a minority (2.9%) were treated by peritoneal dialysis. Two-thirds of haemodialysis patients were dialysed twice weekly (68.4%), and one-third thrice weekly (31.1%). Distribution of patients by residence showed that most patients were clustered in the Cairo Governorate (38.8%). Males constituted 64.2% of the patients. The number of dialysis units was 5.7 units PMP. More than half of the patients ranged between 40 years and 59 years of age with a mean \pm standard deviation of 45.6 ± 14.2 years and a median age of 47 years as shown in Table 1. Almost one-half of the patients (46.3%) had received blood transfusions, while 15.7% had received erythropoietin. HBsAg was positive in 4.8% of the cases. On the other hand, HCV antibodies were positive in 49.1% of the patients. The rate of renal transplantation was 32 per 1000 dialysis patients per year. Renal biopsy was performed for 1.2% of the patients at some time during their illness.

As Figure 1 shows, hypertension was responsible for 28% of the cases of renal failure in Egypt. The other significant causes were: chronic glomerulonephritis (16.6%), ESRD of unknown etiology (16.2%), obstructive uropathy (excluding schistosomal obstructive uropathy) (9.3%), diabetic nephropathy (8.9%), obstructive uropathy due to urinary schistosomiasis (6.0%) and adult polycystic disease of the kidney (4.3%). The etiology of ESRD in different governorate groups is shown in Table 2.

The number of deaths among ESRD patients in 1996 was 117 per 1000 dialysis patients. Causes of death included cardiovascular disease (47%), cerebrovascular accidents (17%), liver cell failure (16.1%), infections (8.7%) and the rest was due to other causes as shown in Figure 2.

Table 1 Summary data

Datum	Value
Number of dialysis centres in Egypt	370
Number of responding dialysis centres	124
Estimated total number of dialysis patients	14 636
Prevalence of ESRD in Egypt	225 per million population
Patients on haemodialysis	97.1%
Patients on peritoneal dialysis	2.9%
Number of dialysis units/million population	5.7
Mean age of dialysis patients \pm s	45.6 ± 14.2 years
Patients receiving blood transfusions	46.3%
Patients receiving erythropoietin	15.7%
Patients with HbsAg	4.8%
Patients with hepatitis C virus antibodies	49.1%
Transplantation rate per year	32 per 1000 dialysis patients
Number of deaths per year	117 per 1000 dialysis patients

ESRD = end-stage renal disease
s = standard deviation

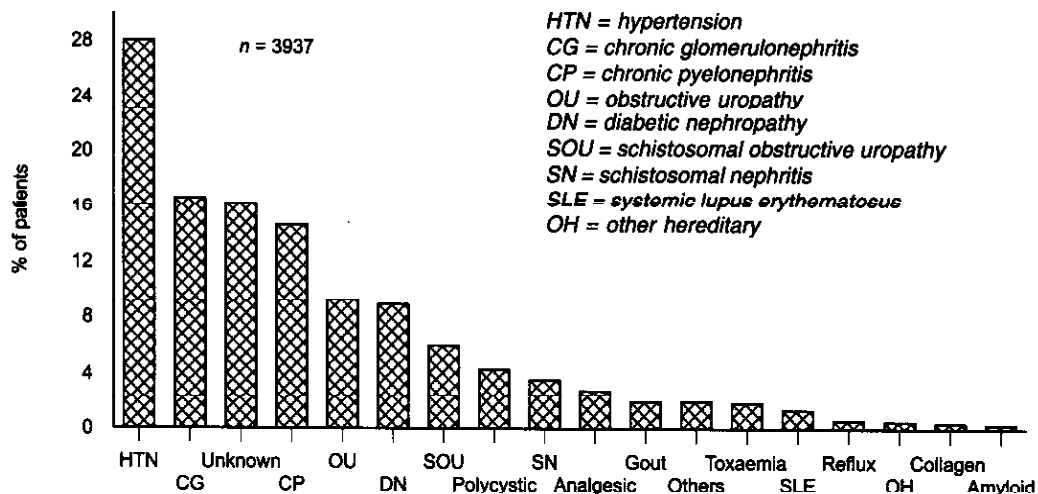


Figure 1 Etiology of renal failure in Egypt

Table 2 Common causes of ESRD in Egypt according to governorate group

Cause of ESRD	Governorate group				
	Calro (%)	Lower Egypt (%)	Upper Egypt (%)	Canal (%)	Border (%)
Hypertension	29.7	28.9	25.0	27.3	26.5
Chronic glomerulonephritis	15.8	15.7	17.7	2.5	29.4
Chronic pyelonephritis	9.5	19.6	17.8	8.3	10.3
Unknown cause	18.1	11.5	15.2	37.2	17.6
Diabetic nephropathy	12.5	6.4	5.2	10.7	11.8
Schistosomal obstructive uropathy	3.9	6.6	8.8	0.0	1.5
Schistosomal nephritis	1.1	6.3	5.5	1.7	0.0

ESRD = end-stage renal disease

Discussion

The prevalence rate of ESRD in Egypt during 1996 was 225 PMP. A more accurate calculation of the prevalence of ESRD in Egypt could have been achieved with a higher response rate to the questionnaire, which would allow better comparison with

other countries. Higher prevalence rates are reported in Japan (1149.9 PMP) and the United States of America (USA) (975 PMP) [10,11]. In Europe, the prevalence rate varies from one country to another, with an average of 283 PMP in 1992 [12]. It should be mentioned that the European Dialysis and Transplantation Association (EDTA) re-

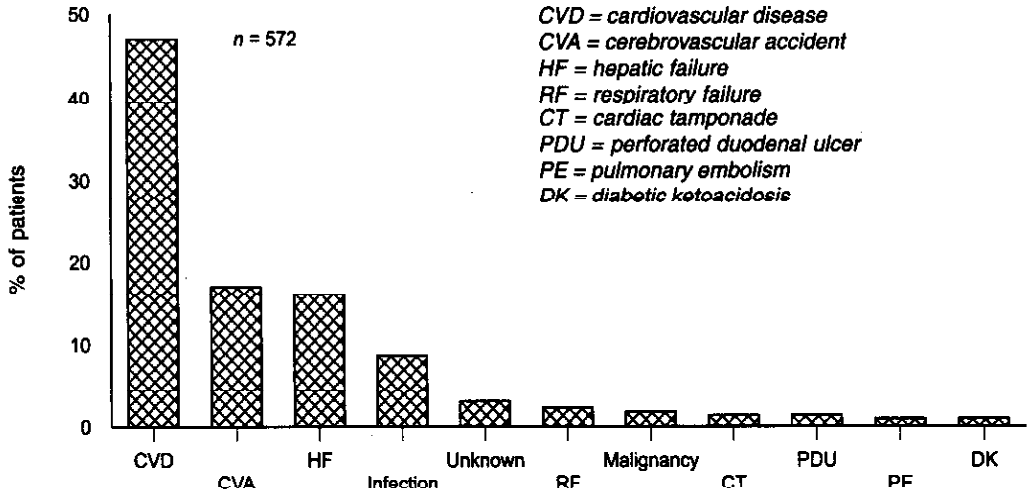


Figure 2 Causes of death among patients with end-stage renal disease in Egypt

ported a low return rate, so the prevalence and incidence of ESRD is under-reported. The difference in prevalence rates between countries is attributed to many factors. A higher prevalence rate correlates positively with gross national product [13].

Most ESRD patients in Egypt are undergoing intermittent haemodialysis treatment (97.1%), while a minority (2.9%) is treated by peritoneal dialysis. Continuous ambulatory peritoneal dialysis (CAPD) is used for only a few patients. The lack of CAPD is due to shortage in training for this kind of treatment and the need to import CAPD systems from other countries. The data showed the need to use different peritoneal dialysis programmes including CAPD, particularly for the elderly, diabetics and those with vascular access problems. Two-thirds of haemodialysis patients are kept on a twice-weekly dialysis schedule despite the availability of an adequate number of dialysis centres (5.7 PMP). This number exceeds that of eastern Europe, western Asia, northern Europe, north Africa and EDTA.

This twice-weekly dialysis schedule reflects, among other factors, the lack of resources at the time (1996). In 1998, the Ministry of Health adopted the thrice-weekly schedule. A recent study in Egypt has shown that the survival rate of patients having thrice-weekly dialysis is more than double that of patients dialysed twice weekly [14].

Very few renal biopsies were performed for patients before reaching ESRD which indicates the need for changing the education and training programmes for nephrologists to emphasize the need for early detection and management of renal diseases that may be complicated by renal failure.

The mean age of patients in our study was 45.6 ± 14.2 years. Previous studies in Egypt found a mean age of 43.0 ± 17.7 years in 1987 [15]. The increasing mean age of ESRD patients in Egypt reflects the universal trend of dialysis patients living longer due to improving health care systems. Better health care can decrease the mortality rate from diabetes and hypertension, but

stops short of preventing ESRD from these diseases. The mean age of ESRD patients in Egypt is lower than that of Latin American countries (50.5 years), EDTA, and much lower than that of the USA [16,17].

Hypertension is responsible for 28% of cases of ESRD in Egypt. This high incidence coincides with that reported in the USA, Japan, Germany and other European countries [17,18]. Although it has been stated that one out of four Egyptians is or will be hypertensive, we believe that this high prevalence can be attributed to the lack of definite diagnostic criteria of hypertensive nephrosclerosis in Egypt as well as in other parts of the world, and that a portion of this group is actually ESRD patients with concomitant hypertension [5]. Chronic glomerulonephritis was the second leading cause of ESRD in Egypt (16.6%). ESRD of unknown etiology was responsible for 16.2% of cases, which is a high percentage in comparison with more industrialized countries.

Obstructive uropathy due to urinary schistosomiasis (caused by *Schistosoma haematobium*) was responsible for 6.0% of cases of ESRD. This contradicts previous reports which consider urinary schistosomiasis a common cause of obstructive uropathy causing renal failure in Egypt (30% of cases) [2]. Schistosomal nephritis (immune-mediated secondary to hepatosplenic schistosomiasis caused by *S. mansoni*) [19-21] was found in 3.6% of cases, and it is reported that about 15% of patients with hepatosplenic schistosomiasis develop immune-mediated glomerulonephritis initiated by schistosomal antigen and propagated by IgA [3]. One explanation for the decreasing prevalence of urinary schistosomiasis (transmitted via the snail *Bulinus truncatus*), and the increasing prevalence of schistosomal nephritis (transmitted via the snail *Biomphalaria alexandrina*) is the

redistribution of snails after the construction of the Aswan High Dam more than 30 years ago. It is now known that the snail responsible for urinary schistosomiasis is disappearing from some governorates in upper Egypt [22]. This snail is being replaced by one responsible for hepatosplenic schistosomiasis, a fact that has been documented by thermal infrared measurements of the earth's surface using satellite imagery [23]. This correlates well with the difference in prevalence of schistosomiasis in upper and lower Egypt. Lower Egypt is known to harbour both types of schistosomiasis, while upper Egypt used to harbour mainly *S. haematobium*. The prevalence in lower Egypt was 6.6% for schistosomal obstructive uropathy and 6.3% for schistosomal nephritis. The prevalence in upper Egypt was 8.8% for schistosomal obstructive uropathy and 5.5% for schistosomal nephritis.

For the treatment of anaemia, 46.3% of patients had received a blood transfusion, while 15.7% had received erythropoietin. The small number of patients receiving erythropoietin is due to its high cost. HB-sAg was positive in 4.8% of the patients and did not correlate with the blood transfusion. On the other hand, HCV antibodies were positive in 49.1% of the cases and correlated significantly with blood transfusions ($P < 0.05$). The high percentage of HCV-positive patients in relation to the low percentage of HBsAg-positive patients is due to the rigid screening of blood donors for HBsAg for many years, whereas HCV screening of blood donors has only recently been introduced. The high prevalence of HCV antibodies has drawn attention to the need for better control of blood screening and the need to increase iron and erythropoietin among dialysis patients instead of blood transfusions.

The rate of renal transplantation was 32 per 1000 dialysis patients per year in which all kidneys came from living donors. This rate is much lower than northern Europe (135 per 1000 dialysis patients) and EDTA (58 per 1000 dialysis patients) [18]. The low transplantation rate is due to a shortage in the number of specialized transplantation centres and the lack of cadaveric organ transplantation. Attempts to establish a programme for cadaveric organ transplantation are on-going although facing some obstacles.

The number of deaths among ESRD patients in 1996 was 117 per 1000 dialysis patients. This number is lower than west Asia, eastern Europe, north Africa and western Europe, but higher than northern and southern Europe [18]. In order to accurately calculate the mortality rate, follow-up surveys over the coming years are needed. Cardiovascular diseases were the leading cause of death (47.0%), followed by cerebrovascular accidents (17.0%). Liver cell failure accounted for 16.1% of deaths. This high rate can be attributed to hepatosplenic schistosomiasis and the high incidence of hepatic co-morbid conditions such as hepatitis viruses. Age and co-mor-

bid factors for those who died could not be analysed.

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