Causes of chronic renal failure in hemodialysis patients of Abadan

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Abstract
Aims: Treatment of chronic renal failure by permanent hemodialysis, in addition to high costs for society, has many physical and psychological problems for patients. The present study was carried out to investigate the most important causes of this failure in hemodialysis patients of Abadan.
Methods: In this cross-sectional study, all 59 patients under permanent hemodialysis during March 6, 2005 to April 6, 2006 in Abadan’s hemodialysis center were evaluated. Required data including age, gender, age of first hemodialysis session, causes of chronic renal failure and dialysis-related variables were collected by checklist from patients’ files and interview as needed.
Results: Hypertension (40.4%), diabetes mellitus (28.1%), infections (12.3%), congenital abnormalities (10.5%) and obstructions (8.8%) were the most common causes of chronic renal failure. Also, 5.3% of cases were causes including glomerulonephritis (3.5%) and lupus (1.8%).
Conclusion: Hypertension is the most frequent cause of end stage renal disease in Abadan and diabetes mellitus and infections are the next.

Keywords: Chronic Renal Failure, Hemodialysis, Hypertension

Introduction
Chronic renal failure (CRF) refers to an irreversible defect of renal function [1] that ultimately leads to the "end stage renal disease" (ESRD) and requires renal replacement treatment (RRT) including dialysis or transplantation. Chronic renal failure is among chronic diseases that have had an ascending trend in recent years, so that in the United States its incidence in the last 20 years has increased 10 times [2]. Annual growth of this disease in Iran, according to the statistics of the Management Center of Transplant and Special Diseases of the Ministry of Health, is approximately 11% and in 2009 had reached about 40 thousand people. Annual incidence of this disease in Iran is 53 per million people and its prevalence rate is 250 per one million people. These figures in the U.S. are respectively 200 and 975 cases per one million people [3]. These patients are not able to continue their life without renal replacement therapy. At the end of 2005 one million and 900 thousand people in the world had been treating by replacement therapies from which 68% with hemodialysis, 8% with peritoneal dialysis and 23% with transplantation continue their life [4]. Approximately 53.7% of patients with CRF in Iran are under permanent hemodialysis and 45.5% own a transplant kidney [4]. Today, more than one million people suffer from renal failure in the world, more than 200 thousand people in the U.S. and 11,250 patients in Iran (until the end of 2004) continue their life with dialysis [5]. CRF treatment with permanent hemodialysis gives rise to major physical and psychological problems for patients in addition to imposing high costs on society [5]. According to some scientific evidence, understanding and recognizing patients in early stages and providing special cares is effective in postponing advanced renal failure and reducing the rate of mortality and costs and increasing the quality of life [6, 7]. Therefore, considering the importance of the prevention of ESRD incidence and also with regard to the effect of geographic differences and the role of genetic factors and environmental factors in its appearance [6], this study was conducted aiming at investigating the relative prevalence and the frequency of predisposing factors leading to renal failure in Abadan so that by presenting the results to the authorities, a step can be taken in reducing the incidence of CRF ESRD prevention [8].

Methods
All 59 hemodialysis patients who were under permanent hemodialysis treatment in Abadan at the time interval (15 March to 15 April in year 2005) were studied by available sampling method. Required information such as age, sex, dialysis onset, causes of renal failure, certain habits, family history of CRF and variables associated with hemodialysis including the number of dialysis sessions per week, creatinine level and initial and current blood pressure, hepatitis B
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...vaccination status and the history of viral infections such as hepatitis and HIV before and after dialysis were extracted from patients’ records and the respective list for each patient was completed. However, due to the weakness in the system of registration of diseases and statistics in Iran and subsequently Abadan, a part of the necessary information for this study was obtained by interviewing patients. In all cases the aim of the study was explained for patients and a written consent was obtained from them.

Patients who had the history of hypertension (blood pressure above 140.90) long time before chronic renal failure were considered as the blood hypertensive, patients with diabetes (type I and II) as diabetic nephropathy and patients who had the diagnosis of glomerulonephritis based on renal biopsy were identified as glomerulonephritis. Patients who were hemodialyzed due to acute renal failure or were hemodialyzed temporarily were not enrolled in the study. After completion of the questionnaire, data were analyzed using SPSS 13 software and were statistically analyzed by descriptive statistical methods.

Results

29 patients were female (49.2%). The mean age of patients was 51.48 years and most frequency was in 40-59 years group. The average age of hemodialysis onset was 49.37 years and the highest frequency was in the 40-59 years group. Patients’ frequency distribution according to age and onset age of dialysis is shown in charts 1 and 2.

Hypertension (40.4%), diabetes (28.1%), infections (12.3%), congenital abnormalities (10.5%) and obstructions (8.8%) were the main causes of chronic renal failure in Abadan. 3.5% of patients had the history of glomerulonephritis and 1.8% had a history of lupus. 29.8% of patients (17 cases), did not mention any history of disease. 19.3% of patients had a smoking history and 4.5% had the history of the use of some narcotics like alcohol, hookah and drugs. The study of the history of nephrotoxic drugs use was also on the agenda, but because of insufficient information in the field drug history, it was not examined. In addition, 7 patients (12.3%) mentioned the history of suffering from diabetes and hypertension at the same time.

Discussion

In the present study, 59 patients with ESRD were studied that with regard to the approximately 250 thousand population of Abadan, the moment prevalence of these disease is 236 cases per one million; this figure is lower than Iran’s average (250) but higher than the prevalence average in the United States (200). The average age of patients in this study was 51.48 years that does not significantly differ from the mean age of patients with ESRD in the study of Shahin et al. in Saudi Jadde (49.5 years) [9]. The mean age of patients’ dialysis onset in present study was 49.37 years that confirm the increase in age of the prevalence of dialysis and with regard to the current trend of society aging, it is expected that the number...
of patients will increase in near future. In the Monfared and Kosravi study in Gilan province, the average age of dialysis onset has been reported and about 68.5% of patients in Fani study in Arak, Shazand and Ashtian have been above 45 years old at the time of dialysis onset. Exceeding of men (50.8%) in the present study correspond with the results of Shahin et al. study and Fani (55.9% male) and Monfared (58.6%) in Gilan study. In this study, high blood pressure as the most common cause of advanced chronic renal failure (40.4%) and diabetes (28.1%), infections (12.3%) and congenital abnormalities (10.5%) were respectively identified as important causes of chronic renal failure. In a study, between 1998 and 2001 in Pakistan, unknown factors (26.3%), diabetes (19.7%), hypertension (19.45%) and obstructions (11.67%) were introduced as the most important causes of chronic renal failure [11].

In a study by Shahin et al. diabetes (29.2%), hypertension (22.1%), unknown causes (20.2%) and chronic glomerulonephritis (9.1%) are the most important causes of chronic renal failure [9]. In Heydari study in seven hemodialysis centers in Mazandaran province in 1998 on 353 patients with mean age of 47 years, high blood pressure with 24.6%, chronic glomerulonephritis with 10.8%, diabetes with 9%, urinary tract and kidney stones with 7.6% were considered as the factors affecting chronic renal failure [12]. Based on the study of Fani on 127 patients, glomerulonephritis (27.5%), hypertension (26%) and diabetes (18%) were the most important causes of chronic renal failure [10].

In most of mentioned studies, hypertension and diabetes are the most common causes of chronic renal failure that with regard to the preventable nature of these two diseases, early diagnosis and treatment of patients can considerably reduce chronic renal failure.

**Conclusion**

While emphasizing on the raising trend of the number of ESRD patients and the high average age of dialysis onset in Abadan, hypertension is the most common cause of chronic renal failure in this city. Then, diabetes and infections are the affecting factors. Considering this issue, the importance of conducting other studies for further investigation of the most important causes of the disease and some measures to reduce these causes seems necessary.

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**References**