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Research Article

Frequency of Ischemic Heart Disease in Patients with End Stage Renal Disease - ə

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ABSTRACT

Introduction: Chronic Kidney Disease (CKD) is a worldwide public health problem and it is increasing over time. Cardiovascular disease is a major concern for patients with end stage renal disease, especially those on hemodialysis. It is the leading cause of death among patients with chronic kidney disease, particularly in dialysis population.

Methods: We have conducted a cross sectional survey on 81 patients of end stage renal disease presented at nephrology department of Mayo Hospital Lahore. Total duration of study was six months. The collected information was recorded directly through Performa. The duration for collecting information from each patient was 10-15 minutes. Data was entered and analyzed on SPSS-version 21.

Results: Out of 81 patients, 56.8% (n = 46) were males and 43.2% (n = 35) were females. Most of the patients in the study were falling in the range of 21-60 years. The mean age was 45.35 with standard deviation of ± 14.16. History of ischemic heart disease in study population was positive in 46 patients in which 52.2% (n = 24) were males and 47.8% (n = 22) were females.

Conclusion: The frequency of ischemic heart disease among chronic kidney disease patients on maintenance hemodialysis is observed to be high, but not as much high as observed in previous studies.

Keywords: End stage renal disease; Ischemic heart disease; Hypertension; Diabetes mellitus

INTRODUCTION

Chronic Kidney Disease (CKD) is a worldwide public health problem and it is increasing over time [1]. A large proportion of CKD patients develop End Stage Renal Disease (ESRD). Most of the patients of ESRD having access to renal replacement therapy are being treated by hemodialysis [2].

Cardiovascular disease is a major concern for patients with end stage renal disease, especially those on hemodialysis. It is the leading cause of death among patients with chronic kidney disease, particularly in dialysis population. It accounts for almost 50% of all deaths occurring due to a known cause in patients undergoing dialysis [3, 4]. Among all the cardiovascular diseases Ischemic Heart Disease (IHD) is the main cause of morbidity and mortality in patients of chronic kidney disease [4]. Lindner et al. [5] reported that 35% of deaths in patients of advanced renal failure undergoing hemodialysis are due to coronary artery disease. Ischemic heart disease has a high prevalence in patients with end stage renal disease and has a marked impact on prognosis [6]. Evidence is present which indicates that a portion of this cardiovascular damage may be due to hemodialysis. It is because it causes hemodynamic instability through the development of subclinical MI [7]. While on hemodialysis, atherosclerotic process accelerates and probability of coronary artery calcification increases with longer duration of dialysis [8]. The incidence of coronary artery disease in patients initiating dialysis is up to 38% with a relative risk of 5 to 20 fold that of the general population [9]. Cardiovascular disease occurring along with chronic kidney disease may be attributed to co-morbidities such as hypertension, diabetes mellitus, dyslipidemias, obesity and smoking [10].

However, CKD itself is considered as an independent risk factor for the development of CVD due to a number of pathological processes associated with it i.e. increased vascular calcification [11], inflammatory process, uremic environment, endothelial dysfunction, high oxidative stress [12,13], over hydration & hypertension, cardiac hypertrophy and anemia [14]. A recent study in Karachi showed the frequency of ischemic heart disease in patients of chronic kidney disease on maintenance hemodialysis to be observed in 70% of cases (112/ 160 cases) [15]. Another study in Pakistan has showed that 49% of the patients of CKD have findings of asymptomatic coronary artery disease [16]. In USA, the prevalence of IHD in hemodialysis patients is 41% [17]. Locatelli F et al. [18] reported that IHD was present in 18.6% of incident ESRD patients. The incidence of ESRD patients receiving hemodialysis is increasing over time; however the prevalence of IHD in these patients remains to be estimated. Thus, our study had the goal of determining the frequency of IHD in these patients. Rationale of our study was to assess that a large number of ESRD patients suffer from ischemic heart disease. So if the study results show huge burden of IHD in ESRD population then as a rule in future this high risk population should be screened for IHD and if required intervention should be done to decrease the mortality in this population.

MATERIAL AND METHODS

We have conducted a cross sectional survey on 81 patients of end stage renal disease presented at nephrology department of Mayo Hospital Lahore. Total duration of study was six months. Patients with end stage renal disease were on maintenance hemodialysis therapy. Sample size of 81 patients is estimated by using 95% confidence level, 10% absolute precision with expected percentage of ischemic heart disease patients as 70% [15]. Type of sampling technique was non-probability convenient sampling. All the patients of end stage renal disease on maintenance hemodialysis were included in this research. However, critically ill unconscious or non-cooperative patients were excluded from the study. No limitations on the basis of time and age of patient were applied.

Data was collected from the patients of end stage renal disease on maintenance hemodialysis at Nephrology Department, Mayo Hospital Lahore. Participants were selected by non-probability, convenient sampling. Data was collected using pre-designed, pre-tested Performa. This included patients' demographic information, history of CKD and hemodialysis, history of co-morbidities, investigational evaluation and history of ischemic heart disease.

The collected information was recorded directly through Performa. Questions related to chronic kidney disease, hemodialysis and ischemic heart disease were asked from every patient and their responses were recorded on composed Performa. The duration for collecting information from each patient was 10-15 minutes.

Data analysis procedure

Data was entered on SPSS-version 21. Quantitative variables i.e. age was presented as mean ± S.D. Qualitative variables i.e. gender was presented as frequency and percentages. Chi-square test was applied to assess the association between qualitative variables while student t-test was applied for analyzing association between quantitative data.

RESULTS

The study was carried out among 81 patients with diagnosis of Chronic Kidney Disease/ ESRD on maintenance hemodialysis. Out of 81 patients, 56.8% (n = 46) were males and 43.2% (n = 35) were females. Most of the patients in the study were falling in the range of 21-60 years. The mean age was 45.35 with standard deviation of ± 14.16.

All patients of ESRD were analyzed on the basis of three different co-morbids including Ischemic heart disease, hypertension and diabetes mellitus. History of ischemic heart disease in study population was positive in 46 patients in which 52.2% (n = 24) were males and 47.8% (n = 22) were females. History of hypertension is present in 92.6% patients (n = 75). Co-existence of hypertension and ischemic heart disease was found in 43 patients. Out of 81 patients of ESRD, history of diabetes mellitus was present in 39.5% (n = 32) patients. Co-existence of DM and IHD was present in 15 patients. Detailed distribution of all co-morbids is given in figure 1.

DISCUSSION

Heart disease is one of the leading causes of death among CKD patients on maintenance hemodialysis, responsible for approximately 45% of the total deaths reported in United States. The incidence of cardiovascular deaths among dialysis patients is 10-20 times greater if compared with general population [15]. This high mortality is attributed, in part, to high prevalence of cardiac disease before start of dialysis and high frequency of risk factors for cardiac disease in patients of CKD [19]. Moreover case fatality rate in dialysis patients with cardiac disease is higher than non-dialysis patients with cardiac disease [20].

In our project a total of 81 patients with diagnosis of CKD were studied, there were 56.8% male and 43.2% female patients. Rate of Ischemic Heart Disease was slightly higher in male cases as compared to females. In a similar study conducted in Karachi, rate of IHD was significantly higher in males as compared to females (76.5% *vs.* 58.6%) [15]. Similarly, a report from European Heart Survey on stable angina depicted that functional testing for IHD and rate of angiography along with interventional procedures is much less in women compared with men [21]. In our study frequency of IHD in patients with CKD on maintenance hemodialysis came to be 56.8% (46/ 81). While Pooran Mal et al. conducted a similar study and their results showed a frequency of 70% of IHD in patients with CKD on maintenance hemodialysis [15]. Another important finding of our study was that the frequency of hypertension in CKD patients was 93.5%, a significant figure while.

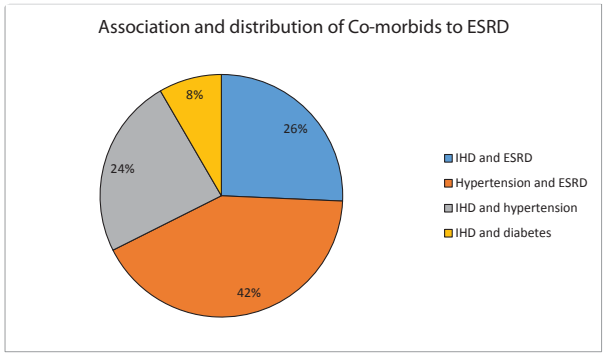

Figure 1: Distribution of co-morbids.

CONCLUSION

The frequency of ischemic heart disease among chronic kidney disease patients on maintenance hemodialysis is observed to be high, but not as much high as observed in previous studies [15]. However the very high proportion of patients with Chronic Kidney Disease on maintenance dialysis showed previous history of Hypertension. Both genders are almost equally affected. It can be concluded that there is a significant association of IHD in ESRD patients who are undergoing dialysis. Therefore, measures and precautions are needed in dialysis patients to avoid any cardiac associated complications which might contribute in worsening of patient's ongoing renal compromise patients to avoid any cardiac associated complications which might contribute in worsening of patient's ongoing renal compromise.

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