ORIGINAL ARTICLES

FREQUENCY OF VARIOUS DYSLIPIDEMIAS IN PATIENTS OF END STAGE RENAL DISEASE UNDERGOING HEMODIALYSIS

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ABSTRACT

Objective: To determine the frequency of various dyslipidemias in patients of End Stage Renal Disease (ESRD) undergoing hemodialysis at Military Hospital (MH) Rawalpindi and Combined Military Hospital (CMH) Lahore.

Study Design: Cross-sectional study

Place and Duration of Study: Nephrology department, MH Rawalpindi and Nephrology department, CMH Lahore, 25th June 2009 to 24th Dec 2009

Patients and Methods: One hundred and twenty six patients with CKD on maintenance haemodialysis were included by convenience non-probability sampling. Predialysis fasting blood samples were obtained and analyzed for serum total cholesterol, high density lipoproteins (HDL), low density lipoproteins (LDL) and serum triglycerides (TGs).

Results: Out of 126 patients, 83 (65.87%) had dyslipidemias. Of these, 66(52.38%) had raised TGs, 37 (29.37%) had low HDL, 30 (23.80%) had raised cholesterol and 13 (10.31%) had an elevated LDL fraction.

Conclusion: Patients of ESRD on hemodialysis suffer from various forms of dyslipidemias. Hypertriglyceridemia and low HDL were the most commonly observed dyslipidemias which should be treated at the earliest to reduce risk of cardiovascular and cerebrovascular disease.

Keywords: Dyslipidemias, ESRD, Hemodialysis.

INTRODUCTION

Chronic kidney disease (CKD) and consequently End Stage Renal Disease (ESRD) have become a global problem[1]. ESRD is associated with various forms of dyslipidemias[2]. Dyslipidemias cause atherogenesis leading to atherosclerosis which in turn greatly increases the risk of cardiovascular, cerebrovascular and peripheral vascular disease[4,5]. These diseases are the major cause of morbidity and mortality in CRF patients[6]. Thus screening for dyslipidemias in ESRD patients is vital so that appropriate treatment could be started[7]. Treatment of these dyslipidemias is dependent upon their frequency and pattern which are different in various populations[8]. Much research has been done in western countries in this regard but studies are lacking in our population. This study will provide useful data on pattern of dyslipidemias in our population and so help in provision of better health care to ESRD patients.

The objective of this study is to determine the frequency of various dyslipidemias in patients of ESRD undergoing haemodialysis at Military Hospital Rawalpindi and Combined Military Hospital Lahore, Pakistan.

PATIENTS AND METHODS

This cross-sectional study was carried out in Nephrology Department, Military Hospital (MH) Rawalpindi and Combined Military Hospital (CMH) Lahore, for a period of 6 months (25 June 2009 to 24 Dec 2009). A total of 126 patients were selected using WHO S.S calculator for sample size and consecutive sampling technique.

Patients were said to have total cholesterol >6.2 mmol/l, HDL cholesterol <0.9 mmol/l, LDL cholesterol >3.4 mmol/l, triglycerides more than 2.3 mmol/l.

Whereas patients with chronic kidney disease on maintainence hemodialysis were said to have End Stage Renal Disease (ESRD).

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Received: 16 Jan 2012; Accepted: 18 June 2012

All patients of ESRD between the age of 30 and 60 years presenting to MH Rawalpindi and CMH Lahore and were on maintenance haemodialysis for a minimum duration of one year were included in the study.

While patients suffering from diabetes mellitus and ischemic heart disease and nephrotic syndrome, on steroids or other lipid lowering agents, smokers, alcoholics and patients with history of familial dyslipidemias were not included in the study.

Data Collection Procedure:

One hundred and twenty six patients (both indoor and outdoor) satisfying inclusion criteria were recruited for this study by convenience method, after taking a detailed history. Written informed consent was obtained from the patients. Name, age, hospital ID number, contact number and address were entered in the proforma. After an overnight fast of 10 to 12 hours, 10-15ml of blood sample was drawn before the start of dialysis and samples sent to laboratory for estimation of serum total cholesterol, HDL and triglycerides. Samples were analyzed using auto analyzers (P 800 Hitachi, Roche company, Switzerland). Serum LDL was calculated using Friedwald formula. Results were entered in the patient's proforma.

Data Analysis Procedure:

All the collected data was entered in SPSS version 11. Descriptive statistics i.e mean and standard deviation were calculated for quantitative variables while frequencies and percentages were calculated for qualitative variables.

RESULTS

Mean age in the study was 50.5 ± 13.22 years, Out of 126 patients, 91 (72.2%) patients were males and 35 (27.8%) were females. Eighty three (65.87%) patients were found to have dyslipidemias, with 66 (52.38%) patients having raised triglycerides, 37 (29.37%) patients had a low HDL, 30 (23.80%) patients were found to have raised cholesterol and 13 (10.31%) patients were found to have raised LDL. Forty three (34.13%) patients had no dyslipidemias (Table).

Table: Frequency of various dyslipidemias. (n =126)

Dyslipidemias	No of Patients (n= 126)	Percentage (%)
Low HDL	37	29.4
Raised TG'S	66	52.4
Raised CHOL.	30	23.8
Raised LDL	13	10.3
No Dyslipidemias	43	34.1

HDL= High Density Lipoprotein Cholesterol
TG'S=Triglycerides
LDL= Low Density Lipoprotein Cholesterol

DISCUSSION

ESRD, apart from being a cause of morbidity and even mortality for the patients, poses significant threat to the economy of a nation as it is a burden on its health resources[1]. ESRD implies permanent loss of normal renal functions which leaves the patient dependent on renal replacement therapy (RRT). ESRD is associated with a number of complications. One such complication is dyslipidemias. Dyslipidemias have two main adverse effects[4]. Firstly they promote atherogenesis which accelerates the process of atherosclerosis, thus compounding the risk of cerebrovascular, cardiovascular and peripheral vascular disease, which are the major cause of morbidity and mortality in ESRD patients[4]. Moreover dyslipidemias also contribute to progression of renal disease. Abnormalities in lipid profile and lipid metabolism start appearing even in initial stages of chronic kidney disease and as renal function progressively declines, dyslipidemias become worse[8]. The pattern and frequency of these dyslipidemias is influenced by various factors: including the population studied, stage of renal disease (stage 1 to ESRD), choice of treatment (conservative vs. RRT), type of RRT (hemodialysis, peritoneal dialysis, or renal transplant) and associated co-morbid conditions.

The results in this study show that a very high percentage of ESRD patients have dyslipidemias. In ESRD patients hypertriglyceridemia is the most frequently observed dyslipidemias. The second most common abnormality is low HDL. High plasma cholesterol and high plasma LDL are the other abnormalities observed in ESRD patients[6]. This implies that therapy with lipid lowering drugs (statins) in ESRD patients not only reduces the

rate of progression of renal disease but also reduces the risk of cardiovascular and cerebrovascular disease. In the western population the most commonly observed dyslipidemia in ESRD patients is elevated plasma triglycerides (approx 50%) along with reduced HDL (approx 25%)[6]. Other abnormalities include elevated total cholesterol (approx 15%) and a high LDL (less than 10% of patients)[6]. Studies carried out in India have shown similar abnormalities in lipid profile of ESRD patients[8]. In this regard research work is lacking in Pakistan and the few studies which have been carried out show results similar to western studies i.e. hypertriglyceridemia (46%), reduced HDL (16%), increased LDL (4%) and increased total cholesterol (16%)[9].

This study has revealed similar results as previously yielded by western studies. Frequency and pattern of various dyslipidemias is similar to the one described in Western literature, 65.87% of the patients had an abnormal lipid profile. Hypertriglyceridemia was the most frequent dyslipidemia (52.38%) followed by a low HDL (29.37%). Total cholesterol was high in 23.80% of patients whereas LDL was raised in 10.31% patients.

CONCLUSION

In this study various forms of dyslipidemias are observed in ESRD patients, Hypertriglyceridemia is the most frequent abnormality followed by a low HDL. Raised cholesterol and LDL are less frequent and are seen in fewer patients. Therefore all ESRD patients should be assessed for dyslipidemias so that appropriate treatment could be started at the earliest.

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