DYSLIPIDEMIA ASSOCIATED WITH CHRONIC KIDNEY DISEASE

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Abstract: Cardiovascular disease is a major cause of morbidity and mortality in patients with impaired renal function. Dyslipidemia has been established as a well-known traditional risk factor for cardiovascular disease (CVD) in the general population and it is well known that patients with chronic kidney disease (CKD) exhibit significant alterations in lipoprotein metabolism. In this review, the pathogenesis and treatment of CKD-induced dyslipidemia are discussed. Studies on lipid abnormalities in predialysis, hemodialysis and peritoneal dialysis patients are analyzed. In addition, the results of the studies that tested the effects of the hypolipidemic drugs on cardiovascular morbidity and mortality in patients with CKD are reported. Hypertriglyceridemia is one of the most common quantitative lipid abnormalities in patients with CKD. The concentrations of triglyceride-rich lipoproteins [very-low-density lipoprotein (VLDL), chylomicrons, and their remnants] start to increase in early stages of CKD and show the highest values in NS and in dialysis patients, especially those who are treated with PD (48-51).All patients with chronic disease experience a secondary form of dyslipidemia This is characterized by an increase in serum triglycerides with elevated VLDL, small dense LDL particles, and low HDL cholesterol. All of these particles are characterized by triglyceride-rich apolipoprotein B (apoB)-containing complex lipoproteins, which have a significant atherogenic potential (1).It is well-known that patients with of Chronic Kidney Renal Disease(CKRD) patients present a common clinical overview of early atherosclerosis with severe cardiovascular and cerebral consequences, and appear at the younger age compared with the healthy population (2).Uremic dyslipidemia persisted years before the introduction of Chronic Kidney Renal Disease(CKRD) and hemodialysis treatment and is presented as a fundamental factor in the onset of early atherosclerosis in these patients. Therefore, the examination of abnormalities of apolipoproteins as well as their etiopathogenesis in these patients treated with reversal hemodialysis in the initial stage (in the first six months) can significantly affect preventative measures against this phenomenon, which will reduce the consequences of apoptoprotein disorders, or even the appearance of early atherosclerosis and its consequences on CKRD patients treated with persistent hemodialysis. Lipid metabolism disorders are considered as one of the most important factors in the occurrence of early atherosclerosis in patients with IRKT (3.4).The purpose of this paper research is to evaluate the anomalies of lipids in uremic patients treated with hemodialysis over 8 years in the Department of Haemodialysis at the Clinical Hospital of Tetovo, randomized by gender, age and underlying disease that has led to uremia. Matherial and methods; In our study are included 120 patients (66 male and 54 female) with ESRD treated with hemodialysis in Clinical Hospital in Tetovo, Nephrology and Hemodialysis Unit. The average age of patients treated with HD, gender male is 56.00±12.00 years, while for female gender is 57.00 ±10.00 years. Controll group consists of 120 helthy individuals with average age for male 55.80 ±8.50 years and for female 57.40±9.60 years. Experimental results: The results achieved are presented in tabular form as follows. The results obtained from patients and control groups in the examined laboratory parameters are: total lipid (g / l), triglyceride (TG), total cholesterol (TC), LDL-ch, HDL-ch (mmol / l) calculate the average value of the three consecutive measurements. Conclusion: Statins in the treatment of uremic dyslipidemia in recent years have shown high positive effects and proved to be very safe in our experience with a 20-mg dose each evening before bedtime. We propose that the use of statins in the treatment of uremic dyslipidemia treated with long-term chronic hemodialysis should be the main step for health workers, taking into account their rare side effects as well-Rhabdomyolisis. The risk of rhabdomyolysis is greater if statin therapy is combined with cyclosporine and other additional fibers.
Key words: dyslipidemia, lipid profile,uremia.

INTRODUCTION

Patients with end-stage renal disease (ESRD) receiving chronic hemodialysis show a high incidence and prevalence of cardiovascular disease of multifactorial etiology and an association between dyslipidemia and accelerated atherosclerosis. Hypertiglyceridemia [due to accumulation of VLDL and remnant lipoproteins such as intermediate-density lipoprotein (IDL)], is also the predominant lipoprotein abnormality in a considerable number of cases with nephrotic range proteinuria This dyslipidemia results from a combination of increased production and reduced clearance of VLDL. It is well known that the progressive delipidation of triglyceride-rich lipoproteins is facilitated by the action of two different enzymes namely endothelial-bound lipoprotein lipase and hepatic lipase. The expression of the genes of these enzymes has been found to be downregulated in patients with NS. In addition, other factors such as hypoalbuminemia and proteinuria may further decrease the efficiency

of lipoprotein lipase-induced lipolysis of triglyceride-rich lipoproteins by interfering with the endothelial binding of the enzyme and by changing the composition of VLDLs in a way that reduces their suitability as lipoprotein lipase substrates, respectively Chronic renal failure (CRF) results in profound lipid disorders, which stem largely from dysregulation of high-density lipoprotein (HDL) and triglyceride-rich lipoprotein metabolism. Specifically, maturation of HDL is impaired and its composition is altered in CRF. In addition, clearance of triglyceride-rich lipoproteins and their atherogenic remnants is impaired, their composition is altered, and their plasma concentrations are elevated in CRF. Impaired maturation of HDL in CRF is primarily due to downregulation of lecithin-cholesterol acyltransferase (LCAT) and, to a lesser extent, increased plasma cholesteryl ester transfer protein (CETP). Triglyceride enrichment of HDL in CRF is primarily due to hepatic lipase deficiency and elevated CETP activity. The CRF-induced hypertriglyceridemia, abnormal composition, and impaired clearance of triglyceride-rich lipoproteins and their remnants are primarily due to downregulation of lipoprotein lipase, hepatic lipase, and the very-low-density lipoprotein receptor, as well as, upregulation of hepatic acyl-CoA cholesterol acyltransferase (ACAT). In addition, impaired HDL metabolism contributes to the disturbances of triglyceride-rich lipoprotein metabolism. These abnormalities are compounded by downregulation of apolipoproteins apoA-I, apoA-II, and apoC-II in CRF. Together, these abnormalities may contribute to the risk of arteriosclerotic cardiovascular disease and may adversely affect progression of renal disease and energy metabolism in CRF. chronic renal failure (CRF) is associated with premature atherosclerosis and increased incidence of cardiovascular morbidity and mortality (5,6,7).Several factors contribute to atherogenesis and cardiovascular disease in patients with CRF. Notable among the CRF-induced risk factors are lipid disorders, oxidative stress, inflammation, physical inactivity, anemia, hypertension, vascular calcification, endothelial dysfunction, and depressed nitric oxide availability. In the past 30 years, numerous studies have been conducted to discern the features and the mechanisms of CRF(chronic Renal falure)-induced dyslipidemia. Most of the earlier studies were focused on the effect of CRF on the concentration, composition, and clearance of various plasma lipoproteins and their remnants. More recent studies were designed to elucidate the molecular mechanisms of CRF-induced alterations in lipid metabolism using experimental animals. The present paper is intended to provide an overview of the features, molecular mechanisms, and potential consequences of dysregulation of lipid metabolism in CRF. The features of dyslipidemia and the alterations in plasma lipoprotein metabolism in humans with CRF have been well characterized. However, the inherent limitations of clinical studies have precluded in-depth investigation of the underlying molecular mechanisms in humans. Such investigations involve probing for mRNA and protein expression in such key organs/tissues as the liver, skeletal muscle, adipose tissue, and myocardium, which cannot be obtained in humans. Moreover, the variabilities in genetic and dietary factors, underlying systemic diseases, and therapeutic regimens among patients with CRF further complicate the task. For these reasons, studies aimed at unraveling the molecular basis of uremic dyslipidemia have employed animals with experimental CRF. Most of these studies have been facilitated by the recent identification of the genes and the corresponding proteins for various enzymes and receptors involved in lipid metabolism.Total cholesterol in patients with ESRD treated with hemodialysis not show any significant difference compared with his own values obtained during examination of helthy population.The most frequent manifestation appear in uremic patients are in these diseases: ischemic heart diseases, acute myocardial infarction, peripheral vascular disease (PVD), peripheral artery occlusive disease (PAOD), cerebrovascular diseases, cerebrovascular accident (CVA). LCAT (Lecithin Cholesterol- Acyltransferasa) in normal plasma plays role in HDL-cholesterol remodeling and is an enzyme that converts free cholesterol into cholesteryl ester (a more hydrophobic form of cholesterol), which is then sequestred into the core of lipoprotein particle, making the newly synthesized HDL spherical. In uremic patients LCAT activity is reduced 30% and optimal conversion is compromised and reduced(8). Experimental clinical investigation (incubation of plasma inuremic patients with LCAT inhibitor or without LCATinhibitor confirm that atherosclerotic processes are directly dependent from ß1-HDL catabolism disorder. ERSD patients treated with HD due to toxic effects often are treated with hypolipidemic drugs. In clinical practice more efficient and appropriate hypolipidemic agents are those who are excreted and eliminated via hepar(HMG-CoA reductasae inhibitors-Statins) compared with hypolipidemic drugs who are excreted by the kidneys. Genetic prediction in appearance of early atherosclerosis and familial predisposition is disorders in reverse cholesterol transport (RVS) and disorders of gene encoding LDL receptors.The pathogenesis of a large number of lipid abnormalities in patients with CKD mainly includes removal of the damaged lipid from circulation.Reduced cleaning of the triglycerids,

which may lead to hypertriglyceridemia, stems from a change in the composition ofcirculating triglycerides (which become enriched with apolipoprotein C-III) and, perhaps later, the curtailment of activity for the operation of lipoprotein lipase and triglyceride hepatic lipase, which are involved in the removal of triglycerides (9,10,11)).The mechanism of activity of lipoprotein lipase reduced in patients with CKD still is not well known, but it is assumed that the activity of reduced LPL is due to the activity of so-called inhibitors of LPL. [4]. In this mechanism important role can play the secondary hyperparathyreoidism connected possibly by increasing calcium inside the cells collected in the liver and adipose tissue. Studies in humans and experimental animals with CKD suggest that parathyroidectomia can normalize serum TG levels and hepatic lipase activity (12,13).There are experimental animal studies that a benefit can be achieved with verapamil treatment, although this has not been confirmed in humans. Another possible mechanism for hypertriglyceridemia of CKD is to maintain a circulating inhibitor of lipoprotein lipase, an increase of HDL-ch concentration and pre beta HDL who mostly is found in the composition of Apo-A (8,9). Disorder of lipid metabolism indiabetic patients and with uremia manifested by increased VLDL, IDL fractions, which are mainly due to a defect in the catabolism of triglyceride-rich lipoproteins (3) and reducing the fraction of HDL-ch.(12,13).LDL-6 concentrations are largely increasing in patients with ESRD treated with hemodialysis, but the underlying major disease remains diabetes compared with other major HTA such diseases, chronic glomeru-lonephritis, polycystic renal disease. Lipid profile abnormalities during uremic syndrome including all apolipoprotein particles. Due to increased concentrations of tryglycerides in VLDL compositions, IDL, LDL and HDL-ch dominate hypertrichic glycemic control. Total cholesterol in patients with ESRD treated with hemodialysis does not show any significant change compared to its values obtained during the examination of the general population. eplacement of physiological lipoapoproteins with phatological, high rate of atherogenesis and the added impact of urea toxins on the structure and composition of lipo-apoproteins in the uremic drug are still undiscovered phenomena, therefore more experimental and multicentric studies are needed. There are confirmed and documented evidence that all values of LDL-ch, Apo B-100,VLDL, LDL, lipoprotein residues, LDL-6, IDL, LDLox, ApoA-1, ApoA- 4, Apo-E polymorphism), Apo-C are the same atherogenic and independent of each other. Some studies have verified that qualitative changes in morphology and the size of lipoproteinemic particles. Hypertriglyceridemia is due to the increased triglyceride content in the structure of VLDL, IDL, LDL-ch and HDL-ch. ApoA-1 is reduced in the structure of LDL-ch, while ApoA-IV is pozadapen. The concentration of ApoB-100 is much higher in the composition of VLDL.The increased concen-trations of HDL-ch in the dialysis pain reduces the reversed cholesterol transport to the black gland, thus creating conditions for cellular accumulation of cholesterol in extrahepatic tissues. The Chronic Kidney Disease (CKD) is characterized by specific metabolic abnormalities of plasma lipids both qualitatively and quantitatively. Most common lipid abnormalities encountered are increased serum triglycerides and decreased serum HDLcholesterol with small alteration of other lipoprotein fraction in serum and in dialysis patients there is more of a dyslipidemia rather than hyperlipidemia. This may be a significant risk factor for vascular complications leading to increased morbidity and mortality in CKD patients.

MATHERIAL AND METHODS

In our study are included 120 patients (66 male and 54 female) with ESRD treated with hemodialysis in Clinical Hospital in Tetovo, Nephrology and Hemodialysis Unit. The average age of patients treated with HD, gender male is 56.00±12.00 years, while for female gender is 57.00 ± 10.00 years. Controll group consists of 120 helthy individuals with average age for male 55.80 ± 8.50 years and for female 57.40±9.60 years. As the material was used for blood tests on patient and control group examiners, the country at 08h nautom at a room temperature of 19-24 ° C, in the bulk of the site to be able to escape the site with variable variables on the values of the corresponding lipoprotein fractures (of 9-12%) who are interviewed if the respondents are found in the placement of the position. Primary blood is most commonly observed immediately before the hemodialysis season (HD), at least after 12 years of age, in order to avoid the cremation-absorption effect on food serum lipids (postprandial HM-emi!).These site respondents list the laboratory analysis that is determined annually with three consecutive measures. The presented results show that the mean value of trimmed measurements under the same conditions is apparent. The blood, sealed with a few capsules of heparin, was removed in parallel with the Laboratories at the Medical Center-Tetovo and the Institute for Clinical Biochemistry at the Clinical Center in Skopje (3 cc serum) - to check and calibrate the exact method of use.The lipid profile, was analyzed by 120 patients with ESRD, out of which 66 were mice 54, underwent hemorrhagic hemorrhage over 10 months in the Department of Nephrology and Hemodialysis at the Medical Center-Tetovo and Clinic for Nephrology at the Medical Faculty-Skopje.

Distribution of patients according to the basic kidney disease is shown in table no. 1

Patient division according to the basic nephropathy	
Total patients=120	*Male= 66(55%) ,Female=54(45%)*
Average age (year)	*M-56.80±12.00,F-57.00±10.00*
Chronic Glomerulonephritis (GN)	*30 (25 %)*
Ess. arterial hypertension	*28 (23.3 %)*
Diabetes Melitus(DM)	*18 (15 %)*
Intersticiopyelonephritis (IPN)	*16 (13..3 %)*
Autosomal dominant polycystic kidney disease (ADPKD)	*12 (10 %)*
Undifferentiated nephropathies	*9 (7.5 %)*
Uroobstructive nephropathy (UOP)	*7 (5.8 %)*
Control group =120	*Male 55.80 ± 8.50, Female 57.40±9.60 years*

The reference values for the lipid profile examined and presented in Table no. 2.

Lipid Profil	Reference values	Authors
TL	4-10g/l	Zollner & Kirsch(40)
TG	0,68-l,70 mmol/l	G. Buccola& H. David(41)
TCh	3,l-5,2 mmol/l	CC. Allain et al. (42)
LDL-Ch	<3,4mmol/l, increased risk: > 4,1 mmol/1	Friedewalde&Fredrickson(43)
HDL-Ch	>1,6mmol/1, increased risk: : < 0,9 mmol/1	G. Warnick et al.(44)

The results obtained for lipids (TCh, TG, HDL-ch, LDL-ch) from ESRD- patients treated with HD and the control group are shown in Table no. 3.

	N°	TCh mmol/l	TG mmol/l	HDL-ch mmol/l	LDL-ch mmol/l
Pat.treated with HD	*120*	4.90 ± 1.25	3.60± 0.60	0.8 ±0.35	4.90±0.60
ControlGroup	*120*	4.95± 1.22	1.30 ±0.63	1.6 ±0.71	2.75±0,75

p		**0.7541**	**0.0001**	**0.0001**	**0.0001**

The results obtained for lipids (TCh, TG, HDL-ch, LDL-ch) from ESRD- patients treated with Statin males and females treated with statin) demonstrated significantly higher value in comparison to controls.

	No	**TCh mmol/l**	**TG mmol/l**	**HDL-ch mmol/l**	**LDL-ch mmol/l**
Pat.threated with statin(10-20mg)	**120**	**5.10 ± 1.25**	**2.30± 0.40**	**1.10 ±0.40**	**3.80±0.90**
ControlGroup	**120**	**4.95± 1.22**	**1.30 ±0.63**	**1.6 ±0.71**	**2.75±0,75**
p		**0.7500**	**0.0001**	**0.0001**	**0.0001**

The table shows a significant difference in the lipid values after therapy with statin TG (2.30 ± 0.40, LDL-ch (3.80 ± 0.90,HDL-Ch-1.10 ±0.40 with p <0.0001 except for TCh, compared with the results obtained for the control group.

DISCUSION

What are the symptoms of ESRD treated with reversed HD, the etiological factors for dyslipidemia are numerous. They indicate the decreased enzymatic activity of lipoprotein lipase (LPL) and triglyceride hepatic lipase (HTGL), the accumulation of urine toxins, and the high serum concentrations of ApoC- III and parathyroid hormone (PTH) (18-22). There are two large classes in circulating lipoproteins that differentiate on the basis of the apolipoprotein composition (ApoA-1 and Apo-B) as the basic constituents of apoproteins. Apolipoprotein, which mainly contains ApoA-1, is high density (HDL) and is antiatherogenous, while Apo-B associates more lipids, is the main constituent in the structure of VLDL, IDL and LDL-ch and is considered as atrogenic apoprotein. LDL lipoprotein rich in large amounts of Apo-B is the most important factor in the genesis of arterial atherosclerosis.35. In urea conditions, the reduced kidney parenchyma is not able to synthesize anti-arteriogenic (ApoA-1) or to develop proterogenic apolipoproteins (ApoB-100) resulting in an increase in TG of over 50% (increase in ApoB-100 and ApoC-III), and a decrease in HDL-ch by 20% (23,24,25).The last year's interest in apolipoproteins (ApoA-1, ApoB-100 ...) as new risk factors for prematurity atherosclerosis in patients with ESRD, is increased, due to the involvement of the kidneys in the metabolism of apoproteins, especially apo (a) and Lp (a) . Patients with ESRD have decreased values of TCh and HDL-ch, and higher values of TG and LDL-ch compared to the control group.Therefore, low concentrations of TCh may be considered to be one of the early preterm atherosclerosis factors patients with ESRD treated with recurrent hemodialysis. There are data supporting the view that low plasma concentrations of HDL-ch are closely related to the reduced synthesis of Apo A-1 in patients with ESRD. The protective effect of HDL-ch against early atherosclerosis is due to its double role in the reversal transported cholesterol mea-cholesterol.HDL-ch eliminates cellular cholesterol and transmits esterified cholesterol (from LCAT-Lecithin-Choleste-rolacyl-transferase) to VLDL and LDL-ch with the aid of cholesterol ester transfer protein. It has been noted that the transmission of cholesterol Reverse Cholesterol Transfer, RCT) from HDL-ch to VLDL / LDL is less represented in the serum of hemodialized patients compared to the control group that presents higher values of transported cholesterol(26,27). Whether RCT progressively decreases with an increase in renal failure, a further RCT indicates that the HDL-ch in urine patients may be less effective in the transfer of cholesterol to the rest of the lipoproteins and therefore the cholesterol shows a higher potential for tissue accumulation. Such defects can lead to accelerated atherosclerosis in ESRD.Therapy with statins partially increases the level of serum HDL-Ch (10-15%) and probably improves RCT in patients with THBI treated with recurrent hemodialysis. What hurts the HD, HTGL has a significantly reduced activity for 33% while the activity of LCAT is reduced by 30% in control with the control group(28). The concentration of ApoA-1 in HDs was reduced due to increased catabolism and to ApoA-2 due to decreased production37. Some studios have shown that the two groups of patients (chronic hemodialysis program, CAPD) have significantly increased concentrations of ApoB-100 contains ApoC-3 (ApoB: C-3) while concentrations of TG, TCh, LDL-ch, ApoB-100 in patients treated with CAPD are higher compared to patients treated with chronic hemodialysis program. Patients with ESRD treated with recurrent HDs have significantly increased concentrations of TG, total Apo-E, ApoC, ApoB-100, ApoCnonB, Lp (a) and LDL-ch / HDL-ch, and have a significant decrease in ApoA- 1, HDL-ch, HDL-ch / ApoA-1, ApoA-1 / ApoB and ApoA-1 / ApoC-3 in

comparison with the control group of healthy subjects(29). Supplementary studios with a larger number of patients are needed to determine the accuracy of the way, the frequency of cholesterol transport, and its relationship to chronic renal insufficiency. The analysis of lipo / apoprotein parameters in our patients shows that they have higher values of TG, ApoB-100 and lowered values of ApoA-1 and HDL-ch in comparison with the control group. A large number investigating how Atmann, Odda, Mathur, Prichard, Milionis found a deterioration in the apo / lipoprotein status of HD patients and an elevated oxidized LDL-ch (30-35). What patients with ESRD treated with raised HD decreased concentrations of Apo-A1 are closely related to the decrease in HDL-ch and the increase in concentrations of ApoB-100, which was followed by accumulation and increase in concentrations of VLDL and IDL .The initial stage of development of early atherosclerosis depends exclusively on the serum LDL-ch, and ApoB-100 values, as well as the lowered levels of ApoA-1. The atherosclerotic effect of dyslipidemia in urine patients is also exacerbated by the increased peroxidation of LDL-ch. Concerning the apolipoprotein abnormality of ApoA-1 and ApoB-100 in our patients relative to the underlying kidney disease, the lowest values of ApoA-1 were found in patients with ADPBB (0.80 ± 0.26 g / l), UON (0.86 (0.20 g / l) and GN (0.90 ± 0.30 g / l) and DM (0.94 ± 0.34 g / l). What patients with HTA, IPN and undifferentiated nephropathies are more than 1.0 g / RV ± 1.0-1.90g / l), which is in agreement with other Kimak E.(37,39,38).Concerning the concentrations of ApoB-100, compared with the initial kidney disease, the highest concentrations of this apoprotein were noted in patients with GN, UON, D.M. and ADPBB (from 2.98 ± 0.59 to 2.58 ± 0.61 g / l; R.V = 0.5 ± 1.60g / l), which is in accordance with the conclusions of Kandoussi Attman,Alaupoviç). It can be concluded that the knowledge of the etiopathogenetic mechanisms of apo / lipoprotein and lipid abnormalities in patients with ESRD treated with recurrent hemodialysis, and the clarification of their role in early atherosclerosis can contribute to the taking of timely preventive measures (dietetic, therapeutic), which reduces the frequency of dyslipidemia, the process of atherogenesis slows down and ultimately reduces the occurrence of cardiovascular and cerebrovascular seizures. However, the fact that additional long-term studios with a higher number of patients with use of less traumatic methods (on pr.dopler measurements of lipid plaques on carotid arteries and other blood vessels) will confirm or eliminate their role as new, independent risk factors for the development of early atherosclerosis in patients with ESRD . Recognizing their physiological functions, the inherent genetic polymorphism, the widespread interiors Individual variations in plasma concentrations of ApoA-1 and ApoB-100 can significantly contribute to the prevention or postponement of prematurity atherosclerosis mainly presented as coronary and / or cerebrovascular disease in uremic populations. *The effect of statins* on the uremic dyslipidemia is investigated in the several studies.especially in the patients treated by maintenance haemodialysis or continuous ambulatory peritoneal dialysis.The dose of 5 mg/day statin for 24 weeks appears to be safe and effective in HD-patients with hypercholesterolemia (significantly diminished total cholesterol and LDL-Ch) .Saltissi D et al.describe the safety and efficacy of simvastatin in patients undergoing CAPD or maintenance haemodialysis(statin 5-20 mg/24h,for 24 weeks).In maintenance dialyzed patients they found LDL-Ch levels reduction for 33%[21].In our study four times higher dose of statin (20 mg/day) for 10 weeks is also safe with the following results: significantly decreased levels for tryglicerides (by 20.9% for men and 18.5% for women) and LDL-Ch(by 31.5% for men and 35.8% for women respectively).Moreover, statins may exhibit additional inhibitory effects on the atherogenesis, such as a modulation of the immune system as triggered by oxidatively modified LDL during dialysis process (as a example of chronically repeated oxidative stress)and a reduction of the inflammatory markers -presumably C-reactive protein,(45,46,47) Reactive Oxygen Species (ROS) are produced at constitutive levels in nonphagocytic cells (e.g., glomerular cells and tubular epithelial cells) for preservation of routine cellular physiology. However, derangements in their production can lead to loss of redox homeostasis and oxidative stress and contributes to proinflammatory and profibrotic pathways in the kidney. Formation of ROS is evident in many areas of the kidney, predominantly in the renal cortices, whereas the medulla can be susceptible to hypoxia and less ROS production under physiologic conditions Chronic Kidney Disease (CKD) is a pro-oxidant state and the degree of intracellular and extracellular oxidative stress is related to the severity of renal failure. The oxidative stress depends on the excess production free radical coupled with low concentration of antioxidants. This also has been observed that free radical induced lipid peroxidative tissue damage has played a significant role in the pathogenesis of various renal diseases. Lipid peroxidation is assayed indirectly by production of secondary products like a water soluble three carbon; low molecular weight reactive aldehyde malondialdehyde (MDA) and assessment of antioxidant status can be measured by estimating Serum Superoxide Dismutase (SOD).Therefore, an attempt has been made in this study to assess the effect of (i) lipid profile and (ii) oxidative stress as evidenced by serum MDA and SOD activity with emphasis on patients under hemodialysis treatment. The spectrum of lipid disorders in chronic kidney disease (CKD) is usually characterized by high triglycerides and reduced high dense lipoprotein (HDL), associated with normal or slightly reduced low dense lipoprotein (LDL)-cholesterol. This dyslipidemia is associated with an increased risk for atherosclerotic cardiovascular disease. Keys for the cardiovascular risk reduction in these patients are lowering the number and modifying the composition of the cholesterol-carrying atherogenic lipoprotein particles.

CONCLUSION

Statins in the treatment of uremic dyslipidemia proved very secure in our experience with the dosage of 20 mg in the evening every day to reduce high concentrations of LDL-ch, TG, IDL, LDL-6, adjusting the concentrateons of Apo-B ,Apo-C, Apo-E and increasing concentrations of HDL-ch, apolipoproteines subfractions and its-Apo-1.Patients treated with HD, considering their rare side effects as rhabdomyolisis with muscular pain and increase creatine kinase (CK). Application of the statins(10-20mg 10 to 20 mg in front of the leaf) in the treatment of uremic dyslipidemia should be a regular pharmaceutical components applied to patients with chronic uremia treated with repeated HD. If taken into consideration all modern theories on the treatment of artherosclerotic processes in ESRD patients, drug treatment of lipids abnormalities is thus necessary that will significa-ntly reduce the risk of cardiovascular and cerebrovascular dissease. Statins have an important role in primary prevention of cardiovascular events and mortality in non-hemodialyzed CKD patients. The benefits in terms of progression of renal failure are contradictory. Patient education regarding dietary regimen should be part of the CKD clinical management

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