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HYPERLIPIDEMIC PATIENTS;

COMPARISION OF EFFECETS OF STATIN AND NIACIN STATIN COMBANITION, ON APOLIPOPROTEIN-B LEVEL IN HYPERLIPIDEMIC PATIENTS.

Marium Shoukat[1], Hijab Batool[2], Faiza Javaid[3]

1. MBBS, M.Phil
Assistant Professor
Department of Biochemistry
CMH Multan Institute of Medical Science.
2. MBBS, M.Phil (Chemical Pathology)
Assistant Professor
Department of Chemical Pathology
Central Park Medical College, Lahore.
3. MBBS, M.Phil (Chemical Pathology)
Assistant Professor
Department of Chemical Pathology
Sharif Medical and Dental College, Lahore.

Correspondence Address:
Dr. Marium Shoukat
647 MDA Cooperative Housing Society
Near Wapda Town, Multan.
mariumshoukat@gmail.com

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ABSTRACT… Objectives: Role of niacin in decreasing cardiovascular accidents by lowering the levels of Apo-B in hyperlipidemic patients. **Background:** In hyperlipidemia, there are high levels of atherogenic lipoproteins leading to higher risk of atherosclerotic cardiovascular events. Patients with dyslipidemia use statins as a mainstay of therapy over last many decades. Recent studies show that apolipoproteins play a major role in formation of atheromatous plaque, thus there is an urgent need to study the effects of lipid lowering medication on apolipoprotiens levels. **Study Design:** Cross sectional analytical study. **Setting:** Sheikh Zayed Hospital Lahore (Department of Biochemistry and Chemical Pathology). **Period:** 12 weeks from July to Sep 2014. **Materials and Methods:** Recently diagnosed hyperlipidemic patients (n=44) were selected for the study purpose and divided into two equal groups; A and B. Each group was given different medication. Group A took only statin while group B took a combination of statin and niacin. Blood samples were taken at the start of medication and then after completion of 12 week time period. **Results:** At the start of the treatment there was no significant difference in the Apo B cholesterol level between the two groups (p value 0.972). However, after the end of 12 week duration, there was a significant reduction in the Apo level of group B taking statin and niacin as compared to group A taking statin alone (p value 0.003). **Conclusions:** Niacin has cardio-protective role when used in combination with niacin.

Key words: Statin, Niacin, Apo B, Atherosclerosis, Cardioprotective.

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INTRODUCTION

Cardiovascular diseases due to atherosclerosis (Atherosclerotic cardiovascular diseases) are the leading cause of death across the world irrespective of different ethnicities. Major risk factor for atherosclerotic cardiovascular diseases is dyslipidemia, which is characterized by high levels of atherogenic lipoproteins.[1]

During the past few decades; statins have been the mainstay of treatment of dyslipidemia. Statins block hepatic synthesis of cholesterol and lower LDL levels up to fifty percent from the baseline values according to potency of the medication.[2] Statins reduce the atherosclerotic cardiovascular disease risk by almost 15 to 37 percent but the remaining risk i.e. of 60 to 80 percent still remains.[3] However, these drugs have disadvantages like high cost and side effects like liver damage and myopathy. Statin drugs do lower the LDL levels but do not raise HDL levels.[4] Also, patients with familial hypercholesterolemia show no response to statin treatment and hence the efficacy of statins remains uncertain in these patients.

There is a significant relationship between Apo B plasma levels and LDL particles and this supports the use of Apo B in clinical assessment of hyperlipidemia patients and making important decisions about treatment.[5] Numerous studies have shown that atorvastatin reduced LDL levels significantly but had no obvious effects on Apo B levels. This shows that if only LDL is used as an indicator of cardiovascular risk and statins remain the mainstay of treatment alone, then patient may still remain untreated.[6]

Many studies in the past have shown that despite aggressive treatment with statins to lower LDL levels, patients still suffer from atherosclerotic

events due to raised Apolipoprotein B concentration. This proves that hyperlipidemic patients require a more effective lipid altering medication to decrease the frequency of cardiac events.[5] In lieu of the above discussion, there is an urgent need to identify new therapeutic agents which have lipid modifying effect on Apolipoprotien profile as well. We designed this project to study the action of statin alone and in combination with niacin on Apolipoprotein B concentration in newly diagnosed hyperlipidemic patients in the setting of Sheikh Zayed hospital, Lahore.

MATERIALS AND METHODS

Our study design was cross sectional analytical and this study was conducted in Sheikh Zayed hospital Lahore. A total of 44 newly diagnosed adult hyperlipidemic patients (both males and females) were selected from medical out-patient department and divided into two equal groups A and B (exclusion criteria: pregnancy, renal or liver disease). Group A was given 20 mg of statin tablet once a day and Group B was given a combination of 20 mg statin and 500 mg of niacin daily. Two blood samples (5 ml fasting sample) were drawn from each study subject; first at the start of the treatment and second at the end of 12 week duration of treatment. Apolipoprotein B levels were measured by immunoturbidimetric method on fully automated chemictry analyzer Humastar-600. Data was analyzed by SPSS 20.0 and normality was tested by Shapiro wilks test. Apo B levels were compared between the two groups by Mann Whitney U test. Change in Apo-B levels during treatment was studied by Wilcoxon signed rank test.

RESULTS

The study subjects were age and gender matched. The median levels of Apo B cholesterol level was 127(115 – 135) mg/dl for group A and 128(117 – 132) mg/dl for group B before therapy. This difference was insignificant with p-value 0.972. The median levels of Apo B decreased in group A to 116(98 – 123) mg/dl and that for group B to 104(92 – 110) mg/dl. The difference between groups after therapy was significant with p-value 0.003. The change in both groups was significant with p-values <0.001.

DISCUSSION

The findings in our study are supported by a study conducted in 2009 in America in which it was found that niacin and statin combination has a sustained favorable effect in lowering Apo B levels when compared with treatment with statin alone. Moreover, in the above mentioned research work, niacin and statin combination increased the level of HDL-C also.[7]

	Apo B cholesterol before therapy (mg/dl)							Apo B cholesterol after therapy (mg/dl)						
	Mean	SD	Min	Max	Q1	Median	Q3	Mean	SD	Min	Max	Q1	Median	Q3
Group A	128	18	106	194	115	127	135	112	17	70	148	98	116	123
Group B	125	10	105	138	117	128	132	98	16	68	120	92	104	110

Table-I. Apo B cholesterol levels for group A and B before and after therapy

	Mean Difference	Mann Whitney U	z	p-value
Before therapy	2.82	240.5	-0.04	0.972
After therapy	13.95	128.0	-2.68	0.007 **

Table-II. Comparison of Apo B cholesterol levels between group A and B before and after therapy by using Mann Whitney U test. **p-value 0.007 significant

	Mean	Std. Deviation	z	p-value
Group A	16.1	10.3	-4.11	< 0.001***
Group B	27.2	12.2	-4.02	< 0.001***

Table-III. Comparison of Apo B cholesterol levels for group A and B between before and after therapy by using Wilcoxon signed rank test. ***p-value < 0.001 highly significant

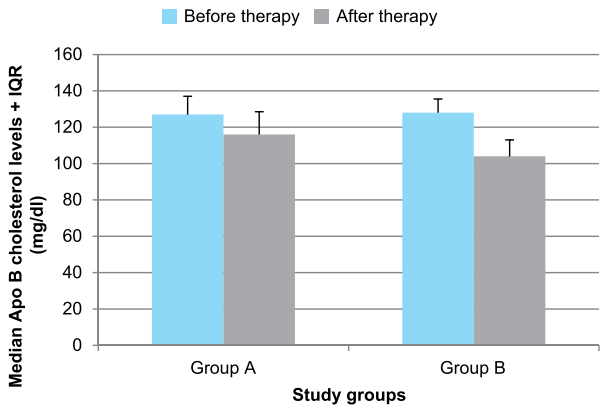

Figure-1. Apo B cholesterol levels for group A and B before and after therapy

Health professional panels and national organizations have suggested that measuring of Apo-B levels should be included in routine lipid profile. Apolipoprotein B is the main component of LDL, VLDL and IDL and thus represents total circulating atherogenic particle. Measurement of Apolipoprotein B can help the physicians to get a clear picture of the patient for have any risk of cardiovascular events. Moreover, Apolipoprotein B estimation does not require a fasting sample and has a very low cost.[8]

Apo B can be used to predict the risk of future atherosclerotic events, can identify the patients requiring aggressive treatment, can be readily measured and is superior to existing diagnostic tests.[9] Two prospective studies show that LDL-C estimation is not significant to predict the risk of future cardiovascular accidents as compared to Apo B and HDL-C with hazard ratio of 1.24 and 1.31 respectively.[10] Another study concluded that Apo B level was even more significant than HDL-C as strong predictor of coronary heart disease.[11]

Many epidemiological studies also support the fact that Apo B is more sensitive and superior to both LDL-C and non HDL-C in cardiac risk prediction in both men and women.[12] Although statins significantly reduce LDL-C levels in hyperlipidemic patients but they are not well tolerated by all patients and cannot manage all components of lipid profile. In contrast to statins, niacin significantly reduces LDL-C, triglyceride and lipoprotein levels. This makes niacin an ideal choice for conditions like diabetes mellitus, metabolic syndrome and hypertriglyceridemia. Niacin also modulates lipid profile and improves outcome in coronary heart disease.[13] In one study it was concluded that statin and niacin combination therapy decreases Apo B levels more significantly as compared to statin or simvastatin/ezetimibe combination therapy.[14] Stefanie Lamon-Fava et al. conducted a study in which they found that niacin and lovastatin decreased LDL-C and Apo B-100 levels by increasing fraction catabolic rate (FCR) of these particles.[15]

It may therefore be concluded from the present study that measuring of Apo-B level should be promoted as an important tool to predict the risk of CHD and related diseases. Moreover it may also be concluded from the study that combination therapy has added beneficial effects on the reduction of Apo-B level and increasing HDL-C level. Both of these effects would help to reduce mortality and morbidity.

CONCLUSION

Niacin has a cardio protective role in hyperlipidemic patients by decreasing Apo B levels when used in combination with statin. Apo-B should be made a part of routine lipid profile, for the early prediction of CHD and stroke.

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Tell a lie once and all your **truths** become **questionable**.

"Unknown"

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Marium Shoukat	Principal author, Data collection, Paper writing.	
2	Hijab Batool	Literature review, data analysis, discussion.	
3	Faiza Javaid	Data analysis, paper writing.	