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ORIGINAL ARTICLE

Vitamin B3 (Niacin) in Diet Act as Protective Negotiator for Development of Myocardial Infarction

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ABSTRACT

Background: Vitamin B3 (Niacin) is known to decrease LDL-cholesterol, and triglycerides, and increase HDL-cholesterol levels. The evidence of benefits with niacin monotherapy or add-on to statin-based therapy is controversial.

Aim: To determine the effects of vitamin B3 with statins on lipid profile of patients of angina pectoris with dyslpidemia.

Study Design: Randomized control trial study.

Place and Duration of Study: Department of Biochemistry, Shaikha Fatima Institute of Nursing & Health Sciences (SFINHS), Lahore with collaboration of Cardiology OPD of Shaikh Zayed Hospital Lahore from 1st November 2019 to 31st January 2020.

Methodology: Seventy four diagnosed cases of angina pectoris with dyslipidemia were recruited with age range from 30 to 50 years. They were divided into two groups; Group I contained 36 patients as controlled group which was given treatment of angina with Tab. Rovista (statin) 10mg at dinner for treatment of dyslipidemia and Group II contained 38 patients as case study group which was given treatment of angina with Tab. Rovista (statin) 10 mg at dinner and tablet Vitamin B3 500 mg with single OD dose at day time for treatment of dyslipidemia for 8 weeks.

Results: The mean serum cholesterol levels at zero level (before the start of treatment) of group I was 244 mg/dl and group II was 246 mg/dl, LDL of group I was 169 mg/dl while group II was 170 mg/dl and HDL of group I was 20 mg/dl while group II was 19 mg/dl . After the treatment group I which taken only statins for treatment of dyslipidemia the mean serum cholesterol levels was 210 mg/dl, LDL was 144 mg/dl and HDL was 26 mg/dl while the mean values of group II (taken statin as well as vitamin B3) serum cholesterol level was 192 mg/dl, LDL was 122 mg/dl and HDL was 44 mg/dl. The results shown there were significant effects of statin therapy along with vitamin B3 on serum LDL and serum HDL levels.

Conclusion: There were significant effects of statin therapy along with vitamin B3 on serum LDL and Serum HDL levels.

Key Words: Vitamin B3, Serum Cholesterol, Serum LDL &HDL

INTRODUCTION

Myocardial infarction (MI) is one of the leading cause of mortality of our society.[1] The studies showed that 30% Pakistan population more than age of 45 years is suffering from MI.[2] The stressful life, high fatty diet, lack of exercise, increased level of serum cholesterol and low density lipoprotein and decreased level of High density lipoproteins (HDL) are the predisposing factors for the development of MI.[3] Due to disturbance in lipid profile there is development of atherosclerosis in vessels which are prone to develop angina and later myocardial infarction.[4]

Vitamin B3 (Niacin) in old decades acts like as therapeutic agent for treatment of dyslipidemia when statins was not discovered.[5] Vitamin B3 basically lowers the level of bad cholesterol (LDL) by inhibiting the enzyme diacyl glycerol transferase-II in liver and increase the level of good cholesterol (HDL) which revert the cholesterol from blood vessels by action on the enzyme hepatocyte surface expression of chain adenosine triphosphate synthase.[6,8] The meat, peanuts, liver, salmon, eggs and protein rich diet which contain good amount of tryptophan are the good dietary sources of vitamin B3.[7]

The different research experiments shown that effects of vitamin B3 on lipid profile controversial. Therefore, this study was carried out to determine the effects of vitamin B3 on lipid profile in patients of angina pectoris which are prone to myocardial infarction.

MATERIAL AND METHODS

This randomized control trial was conducted at Department of Biochemistry, Shaikha Fatima Institute of Nursing & Health Sciences (SFINHS), Lahore with collaboration of Cardiology OPD of Shaikh Zayed Hospital Lahore from 1st November 2019 to 31st January 2020. A total of 74 diagnosed cases of angina pectoris with dyslipidemia from Cardiology OPD were recruited with age range from 30 to 50 years of age. The females, cases of diabetes mellitus, liver disorder, renal disorders and history of malignancy were excluded from this study.

The samples were divided in to two groups; Group I & Group II, Group-I contained 36 patients as controlled group which was given treatment of angina with Tab. Rovista (Statin) 10mg at dinner for treatment of dyslipidemia and Group-II contained 38 patients as case study group which was given treatment of angina with Tab. Rovista (Statin) 10 mg at dinner & Tab. Vitamin B3 500 mg with single OD dose at day time for treatment of dyslipidemia for 8 weeks. Total 5ml blood was drawn under aseptic measurement at level zero (before start of treatment) and at level-I after the completion of 8 weeks of therapy. The lipid profile

measured by enzymatic methods on auto analyzer Humaster 600.

The Statistical analyses was done by using SPSS 21.0 version by applied Paired student 't' test.

RESULTS

The mean serum cholesterol levels at zero level (before the start of treatment) of group-I was 244 mg/dl and group II was 246 mg/dl, LDL of group I was 169 mg/dl while group II was 170 mg/dl and HDL of group I was 20 mg/dl while group-II was 19 mg/dl . After the treatment group I which taken only statins for treatment of dyslipidemia the mean serum cholesterol levels was 210 mg/dl, LDL was 144 mg/dl and HDL was 26 mg/dl while the mean values of group II (taken statin as well as vitamin B3) serum cholesterol level was 192 mg/dl, LDL was 122 mg/dl and HDL was 44 mg/dl. The results shown there were significant effects of statin therapy along with vitamin B3 on serum LDL and serum HDL levels.

Table 1: Serum Cholesterol, LDL&HDL values at different stages of Group I & Group I

Parameter	Group I	Group II
S. Cholesterol mg/dl (zero level)	244	246
S. Cholesterol mg/dl (Level-I)	210	192*
S. LDL mg/dl (Zero level)	169	170
S. LDL mg/dl (Level-I)	144	122*
S. HDL mg/dl (Zero Level)	20	19
S.HDL mg/dl (Level-I)	26	44**

(p = * <0.05, ** <0.001)

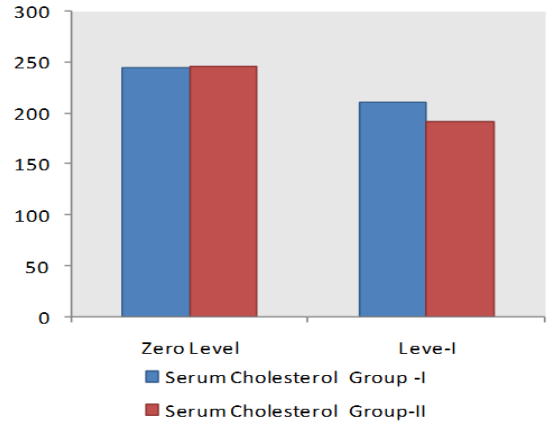

Fig. 1: Serum Cholesterol Levels of Group I and II at both levels of study

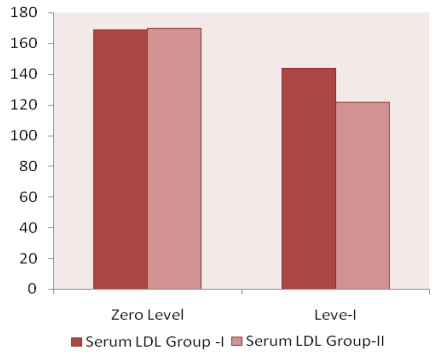

Fig. 2: Serum LDL Levels of Group I and II at both levels of study

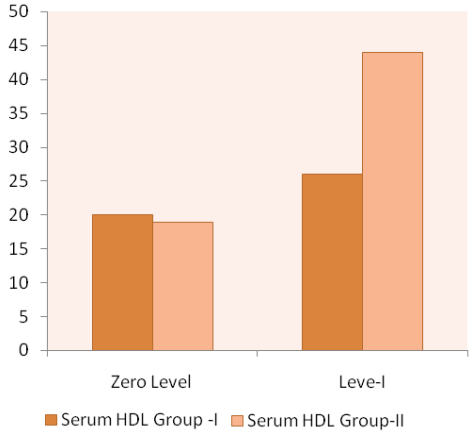

Fig. 3: Serum HDL Levels of Group I and II at both levels of study

DISCUSSION

This study was conducted to ascertain whether statin and vitamin B3 combination can reduce cardiovascular risk by increasing HDL Cholesterol and reducing total and LDL Cholesterol as compared to statin alone. The group which used a combination therapy in our study showed a significant increase in HDL Cholesterol when compared to statin only. Similarly the group which used a combination therapy in our study also highlights significant reduction in Total as well as LDL Cholesterol.

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-Cholesterol also.[9] Similar results were obtained by study conducted in 2004 by McKenney[10] in which cardiovascular risk was definitely limited when both drugs were used in combination which leads to HDL-cholesterol increasing effect of Niacin and LDL-cholesterol lowering effect of statin.

Stefania et al[11] conducted a study showed that by combination therapy of Niacin and statin decrease LDL-cholesterol as well as ApoB-100 levels due to increase fraction catabolic rate of these particles. Shoukat et al[12] in 2018 also highlight the similar results. At least Niacin along with stain gives far significant results in raising HDL cholesterol and decreasing cholesterol as well as LDL-Cholesterol.[13]

CONCLUSION

Vitamin B3 have important role to enhance the serum HDL levels which is good cholesterol and reduce the levels of LDL which is bad cholesterol; so vitamin B3 is cardio protective agent. Therefore proper amount of vitamin B3 in our diet can be protective agent from myocardial infarction and cardiovascular disorders.

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