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ORIGINAL ARTICLE

Evaluation of the effect of statins on glycemic control

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ABSTRACT

Background: Indians have the lowest high-density lipoprotein-cholesterol (HDL-C) and recent studies have revealed that a low HDL-C and high TC/HDL ratio is one of the major predictor for CAD. The present study was conducted to evaluate the effect of statins on glycemic control. **Materials & Methods:** The present study was conducted on 84 cases on statins of both genders. Patients above 30 years of age and on statins for at least 1 year with a fasting blood glucose level <100 mg/dl at the time of initiation of statin were included in the study. In all patients, lipid profile and side effects of statins was recorded. **Results:** Out of 84 patients, males were 52 and females were 32. Hypertension was present in 80, hypercholesterolemia in 82 and ischemic heart disease (IHD) in 39. The mean triglycerides in patients was 138.2 mg/dl, LDL was 124.8 mg/dl and HDL was 34.5 mg/dl. Headache was seen in 31, myalgia in 45, tingling in 28, loss of apetite in 45 and hepatitis in 14. The difference was non-significant (P> 0.05). **Conclusion:** Statins have a mild-to-moderate risk of developing DM. The dose of statins is an important factor that increases the risk of diabetes.

Key words: Diabetes, Statins, LDL

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INTRODUCTION

Premature mortality regarding life lost due to cardiovascular diseases (CVDs) in India has increased drastically from 23.2 million in 1990 to over 37 million in 2010. The results of the Framingham Heart study in 1948 revealed a correlation between hypercholesterolemia and CVD.[1]

It was shown that Indians have the lowest high-density lipoprotein-cholesterol (HDL-C) and recent studies have revealed that a low HDL-C and high TC/HDL ratio is one of the major predictor for CAD and Indians have a similar pattern of lipid profile.[2] Therefore, intensive statin therapy is recommended in the South Asian population.[3] The recent association of statins with development of new onset diabetes (NOD) has been of utmost interest to the researchers.[4]

Statins inhibit 3-hydroxy-methylglutaryl coenzyme A (HMG-CoA) reductase, which is responsible for the reduction in the serum low-density lipoprotein (LDL)-cholesterol level. Since the introduction of statin in 1987, many clinical studies have reported that statin therapy reduces major cardiovascular events by reducing the LDL-cholesterol level, which led to a revolution in the management of cardiovascular disease.[5] The Scandinavian Simvastatin Survival Study (4S) was the first large-scale study showing that using statins reduced major cardiovascular events, cardiovascular mortality, and total mortality in patients with coronary artery disease and high blood cholesterol levels.[6] The present study was conducted to evaluate the effect of statins on glycemic control.

MATERIALS & METHODS

The present study was conducted in the department of Pharmacology. It comprised of 84 cases on statins of both genders. The study protocol was approved from institutional ethical committee. All patients were informed regarding the study and written consent was obtained.

General information such as name, age, gender etc. was recorded. Patients above 30 years of age and on statins for at least 1 year with a fasting blood glucose level <100 mg/dl at the time of initiation of statin were included in the study. In all patients, lipid profile and side effects of statins was recorded. Results were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 84		
Gender	**Male**	**Female**
Number	52	32

Table I shows that out of 84 patients, males were 52 and females were 32.

Graph I Distribution of patients

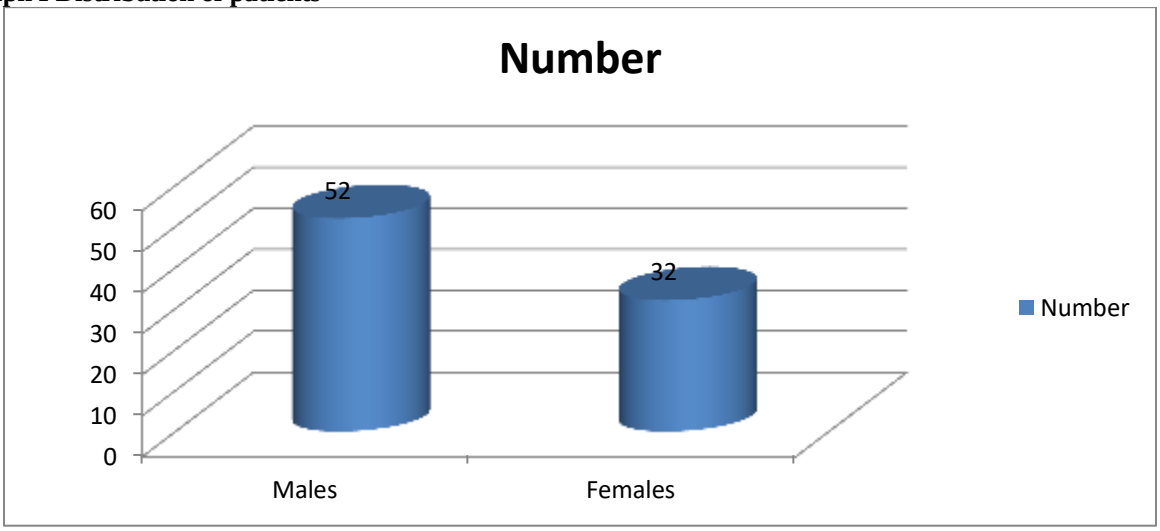

Table II Baseline demographic parameters of patients

Parameters	Number	P value
Hypertension	80	0.81
Hypercholesterolemia	82	
Ischemic heart disease	39	

Table II, graph II shows that hypertension was present in 80, hypercholesterolemia in 82 and ischemic heart disease (IHD) in 39. The difference was non- significant (P> 0.05).

Graph II Baseline demographic parameters of patients

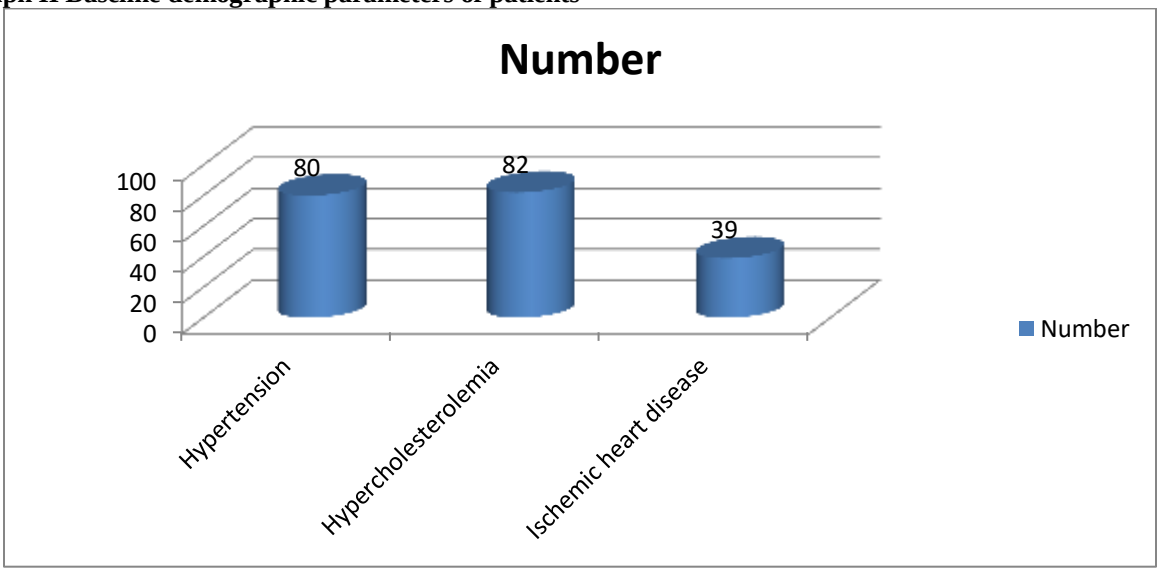

Table III Lipid profile in patients

Lipid profile (mg/dl)	Mean	P value
Triglycerides	138.2	0.57
LDL	124.8	
HDL	34.5	

Table III, graph III shows that mean triglycerides in patients was 138.2 mg/dl, LDL was 124.8 mg/dl and HDL was 34.5 mg/dl. The difference was non- significant (P> 0.05).

Table IV Side-effect in patients on statins

Side effects	Number	P value
Headache	31	0.71
Myalgia	45	
Tingling	28	
Loss of apetite	45	
Hepatitis	14	

Table IV shows that side effects such as headache was seen in 31, myalgia in 45, tingling in 28, loss of apetite in 45 and hepatitis in 14. The difference was non- significant (P> 0.05).

DISCUSSION

The statins also have demonstrated efficacy in patients with a broad range of initial cholesterol levels but without coronary artery disease and in patients with average cholesterol levels and coronary artery disease.[7] Statins have also been shown to significantly reduce cardiovascular clinical events in a variety of patients, ranging from those with established cardiovascular disease to those who are at risk for cardiovascular disease, in large clinical studies such as the Heart Protection Study of cholesterol-lowering with simvastatin in 20,536 high-risk individuals, a study of pravastatin in elderly individuals at risk of vascular disease, and the Anglo-Scandinavian Cardiac Outcomes Trial Lipid-Lowering Arm (ASCOT-LLA).[7] The present study was conducted to evaluate the effect of statins on glycemic control.

In present study, out of 84 patients, males were 52 and females were 32. Hypertension was present in 80, hypercholesterolemia in 82 and ischemic heart disease (IHD) in 39. The difference was non- significant (P> 0.05). Kjekshus et al[8] found that a total of 104 patients met the inclusion criteria, of which eight patients (7.7%) developed NODM and 4 (3.8%) developed prediabetes. Atorvastatin 40 mg was most commonly prescribed statin. About 25% of patients taking atorvastatin 80 mg developed diabetes.

A meta-analysis of primary and secondary prevention trials of statin therapy demonstrated a 20% reduction of major cardiovascular events and stroke per 1-mmol/L reduction in LDL-cholesterol levels. There was also a linear relationship between the reduction in major cardiovascular events and the LDL-cholesterol level in secondary prevention studies using statins.[9]

We found that hypertension was present in 80, hypercholesterolemia in 82 and ischemic heart disease (IHD) in 39. The mean triglycerides in patients were 138.2 mg/dl, LDL was 124.8 mg/dl and HDL was 34.5 mg/dl. Side effects such as headache was seen in 31, myalgia in 45, tingling in 28, loss of apetite in 45 and hepatitis in 14.

Collins et al[10] proposed that the incidence of DM with atorvastatin 80 mg, rosuvastatin 20 mg, and pravastatin 40 mg was 15%, 25%, and 7% respectively. Five population-based studies have reported this incidence to be between 18% and 99%. The recent American College of Cardiology (ACC)/American Heart Association (AHA) guidelines has reported lowering the low-density lipoprotein cholesterol (LDL-C) target levels, prescribed by the 2011 European Society of Cardiology (ESC)/the European Atherosclerosis Society (EAS). The new ACC/AHA guidelines have overemphasized the use of statin while ignoring lipid targets, and have recommended primary prevention with moderate-intensity statin to individuals with diabetes aged 40–75 years and with LDL-C 70–189 mg/dL. Treatment with statin was based on estimated 10-year atherosclerotic-CVD (ASCVD) risk in individuals aged 40–75 years with LDL-C 70 to 189 mg/dL and without clinical ASCVD or diabetes. Adoption of the recent ACC/AHA guidelines will lead to inclusion of a large population for primary prevention with statins, and would cause over treatment to some who actually would not need statin therapy but instead should have been recommended life style modifications.

CONCLUSION

Authors found that Statins have a mild-to-moderate risk of developing DM. The dose of statins is an important factor that increases the risk of diabetes.

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