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Original Research

Efficacy of Rosuvastatin, pravastatin and atorvastatin among dyslipidemic diabetic patients

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ABSTRACT:

Background: There is high rates of dyslipidaemia among diabetic patients which is believed to be one of the major factors accounting for the high percentage of deaths among diabetics due to cardiovascular disease. The present study compared rosuvastatin, pravastatin and atorvastatin among dyslipidemic diabetic patients. **Materials & Methods:** 60 type II diabetic patients of both genders were grouped. Group I patients received 20 mg atorvastatin, group II received 20 mg rosuvastatin and group II received 20 mg pravastatin. Lipid profile such as LDL, HDL, TG, total cholesterol level was measured. **Results:** The mean % reduction LDL was -19.2 in group I, -29.4 in group II and -10.2 in group III, % reduction TG was -19.8 in group I, -25.4 in group II and -12.4 in group III, % reduction TC was -13.6 in group I, -22.6 in group II and -15.7 in group III and % increase HDL was -5.2 in group I, -4.6 in group II and -5.9 in group III. The difference was significant (P< 0.05). **Conclusion:** The rosuvastatin was the most effective statin at reducing LDL-C as compared to atorvastatin and pravastatin.

Key words: Atorvastatin, Dyslipidaemia, Pravastatin

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INTRODUCTION

Diabetes is now commonly recognized as a "coronary heart disease risk equivalent".[1] This is mainly attributed to the high rates of dyslipidaemia among diabetic patients which is believed to be one of the major factors accounting for the high percentage of deaths among diabetics due to cardiovascular disease (CVD).[2] Diabetes mellitus is a very commonly occurring metabolic disorder characterized by hyperglycaemia and altered metabolism of lipids, proteins, and carbohydrates which is due to absolute or relative deficiency of insulin or insulin resistance. Diabetes mellitus is associated with increased oxidative stress due to hyperglycemia.[3] The oxidative damage plays a role in development of micro and macro vascular complications, leading to a significant impact on quality of life. Long-term complications involve almost all vital organs such as heart, eyes, kidney, blood vessels, and nervous system. These complications lead to the development of obesity, hypertension, dyslipidaemia, and insulin resistance.[4]

Statins are considered the first pharmacological line of treatment of dyslipidaemia in diabetic patients. Lowering of LDL-C levels is thought to be the main beneficial effect of statin treatment; although, effects on HDL-C and other lipoproteins also play a role. There are currently seven approved statins which are commonly prescribed, and each has a different benefit-risk profile.[5]

Atorvastatin, on the other hand, was previously, before the approval of rosuvastatin, documented to be the most potent statin at reducing LDL-C levels. Alternatively, pravastatin which is available at the higher doses of 20 mg and 40 mg is found to be slightly less effective; the main reason for its prescription in patients is put down to its hydrophilic properties which make it more tolerable to patients with greater risk factors in addition to CVD.[6] The present study compared rosuvastatin, pravastatin and atorvastatin among dyslipidemic diabetic patients.

MATERIALS & METHODS

The present study comprised of 60 type II diabetic patients of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. A random blood glucose along with glycated hemoglobin level was assessed. Grouping of patients was performed. Group I patients received 20 mg atorvastatin, group II received 20 mg rosuvastatin and group II received 20 mg pravastatin. Lipid profile such as LDL, HDL, TG, total cholesterol level was measured. Results thus obtained were subjected to statistical analysis using Chi- square test. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II	Group III
Drug	20 mg Atorvastatin	20 mg Rosuvastatin	20 mg Pravastatin
M:F	11:9	12:8	9:11

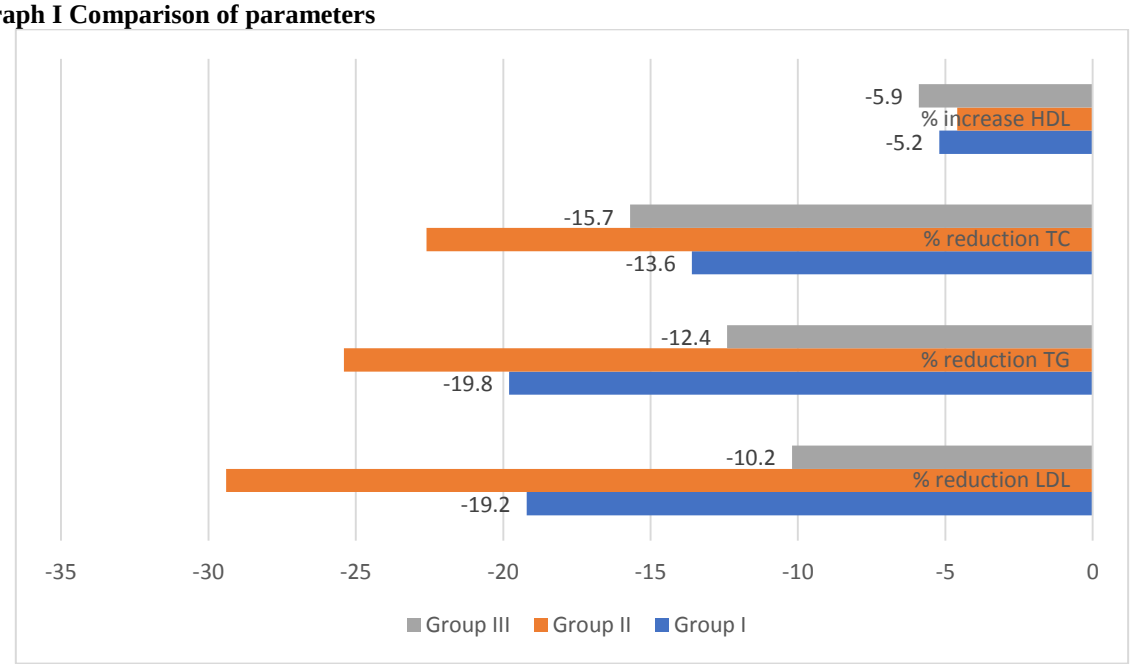
Table I shows that group I had 11 males and 9 females, group II had 12 males and 8 females and group III had 9 males and 11 females.

Table II Comparison of parameters

Parameters	Group I	Group II	Group III	P value
% reduction LDL	-19.2	-29.4	-10.2	0.01
% reduction TG	-19.8	-25.4	-12.4	0.03
% reduction TC	-13.6	-22.6	-15.7	0.02
% increase HDL	-5.2	-4.6	-5.9	0.01

Table II, graph I shows that mean % reduction LDL was -19.2 in group I, -29.4 in group II and -10.2 in group III, % reduction TG was -19.8 in group I, -25.4 in group II and -12.4 in group III, % reduction TC was -13.6 in group I, -22.6 in group II and -15.7 in group III and % increase HDL was -5.2 in group I, -4.6 in group II and -5.9 in group III. The difference was significant (P< 0.05).

Graph I Comparison of parameters



DISCUSSION

The prevalence of type 2 diabetes in adults was estimated at 2.8% worldwide in 2000, and predicted to increase to 4.4% by 2030.[7] Patients with type 2 diabetes have a risk of cardiovascular disease approximately two- to four-times greater than that in the non-diabetic population. Statins are recognized as first-line therapy for cholesterol lowering and have been proven to reduce cardio-vascular morbidity and mortality in large outcome trials in various populations.[8] The benefits of statin therapy extend to patients with diabetes, as shown by subgroup analyses of patients with diabetes in several of the major statin outcome studies, including the cholesterol and recurrent events (CARE) study, the scandinavian simvastatin survival study (4S), the long-term intervention with pravastatin in ischemic disease (LIPID) study and the Heart Protection Study. The collaborative atorvastatin diabetes study (CARDS) recently investigated the effects of lipid lowering with

statin therapy specifically in patients with type 2 diabetes. The primary endpoint, time to the first occurrence of acute coronary events, coronary revascularisation or stroke, was significantly reduced by 37% in patients treated with atorvastatin 10 mg compared with placebo. In addition, LDL-C levels were significantly reduced by 40% in the atorvastatin 10 mg group compared with the placebo group ($p < 0.001$).[9] The present study compared rosuvastatin, pravastatin and atorvastatin among dyslipidemic diabetic patients.

In present study we found that group I had 11 males and 9 females, group II had 12 males and 8 females and group III had 9 males and 11 females. Barakat et al[10] investigated the efficacy and the safety of the three most commonly prescribed statins (rosuvastatin, atorvastatin, and pravastatin) for managing dyslipidaemia among diabetic patients in Qatar. 350 consecutive diabetes patients who were diagnosed with dyslipidaemia and prescribed any of the indicated statins between September 2005 and September 2009. Rosuvastatin (10 mg) was the most effective at reducing LDL-C (29.03%). Atorvastatin reduced LDL-C the most at a dose of 40 mg (22.8%), and pravastatin reduced LDL-C the most at a dose of 20 mg (20.3%). All three statins were safe in relation to muscular and hepatic functions. In relation to renal function, atorvastatin was the safest statin as it resulted in the least number of patients at the end of 2 years of treatment with the new onset of microalbuminuria (10.9%) followed by rosuvastatin (14.3%) and then pravastatin (26.6%). In the Qatari context, the most effective statin at reducing LDL-C was rosuvastatin 10 mg. Atorvastatin was the safest statin in relation to renal function. Future large-scale prospective studies are needed to confirm these results.

We found that mean % reduction LDL was -19.2 in group I, -29.4 in group II and -10.2 in group III, % reduction TG was -19.8 in group I, -25.4 in group II and -12.4 in group III, % reduction TC was -13.6 in group I, -22.6 in group II and -15.7 in group III and % increase HDL was -5.2 in group I, -4.6 in group II and -5.9 in group III. STELLAR[11] trial found rosuvastatin (40 mg) to be the most effective on increasing HDL-C. In fact, it is noted that across dose ranges, the HDL cholesterol increasing effect of rosuvastatin was consistent across the dose range and was significantly higher ($P< 0.001$) compared with those of simvastatin and pravastatin. The PULSAR[12] study investigated starting doses of rosuvastatin and atorvastatin, they found that the increase in HDL-C was significantly greater statistically with rosuvastatin (10 mg) than with atorvastatin (20 mg).

CONCLUSION

Authors found that the rosuvastatin was the most effective statin at reducing LDL-C as compared to atorvastatin and pravastatin.

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