COMPARISON OF ATORVASTATIN AND ROSUVASTATIN AS LIPID LOWERING AGENTS IN TYPE II DIABETES PATIENTS

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ABSTRACT:

Background: Hyperlipidemia is an abnormal elevation of serum lipid levels in the blood which culminate in the development of atherosclerosis. The present study compared atorvastatin and rosuvastatin as lipid lowering agents in type II diabetes patients.

Materials & Methods: 58 patients of type II diabetes of both genders were divided into 2 groups of 29 each. Group I received once daily dose of 10 mg atorvastatin and group II received 10 mg rosuvastatin for 8 weeks. Efficacy and safety of drugs was carried out in both groups.

Results: The mean weight in group I was 82. Kg, in group II was 83.1 Kg, BMI was 29.4 Kg/m² and in group II was 4.6 Kg/m², LDC-C was 4.5 mmol/L in group I and in group II was 4.6 mmol/L, HDC-C was 1.3 mmol/L in group I and 1.4 mmol/L in group II and TG was 2.1 mmol/L in group I and 2.1 mmol/L in group II. The mean change of LDC-C, mmol/L was -52.5 in group I and -51.6 in group II, HDC-C, mmol/L was 5.3 in group I and 4.4 in group II, TG, mmol/L was -21.4 in group I and II each and TC was -34.6 in group I and -32.1 in group II.

Conclusion: Rosuvastatin found to be more effective than atorvastatin as lipid lowering agent in type II diabetes.

Key words: Atorvastatin, Diabetes, Rosuvastatin

I. INTRODUCTION

Hyperlipidemia is an abnormal elevation of serum lipid levels in the blood which culminate in the development of atherosclerosis. Atherosclerosis is a chronic disease of arterial wall and may give rise to myocardial infarction, ischemic stroke and peripheral vascular disease as its aftermath. Globally, one-third of ischemic heart disease is attributable to high cholesterol level, which is estimated to cause 2.6 million death and 29.7 million disabilities.

Patients with type 2 diabetes have a risk of cardiovascular disease approximately two- to four-times greater than that in the non-diabetic population. There is a close association between complications of diabetes and diabetic dyslipidemia. Diabetic dyslipidemia accounts for around 80 percent diabetic deaths due to cardiovascular complications. There is a growing body of evidence to show that hyperglycemia and dyslipidemia are associated with excess of cardiovascular risk.
Furthermore, their prognosis is worse; in a Swedish study the 5-year mortality rate after myocardial infarction was 55% for patients with diabetes compared with 30% in patients without diabetes and the re-infarction rates were 42% and 25%, respectively. More recent data reflecting the outcome of new evidence-based interventions in acute myocardial infarction demonstrate that the difference between diabetic and non-diabetic subjects is still present, showing a 1-year mortality in males of 22.3% versus 13.0% in males and 26.1% versus 14.4% in females. The elevated cardiovascular risk in patients with type 2 diabetes is primarily attributed to the clustering of atherogenic risk factors, including dyslipidaemia, hypertension, abdominal obesity, left ventricular hypertrophy, and impaired fibrinolysis. The present study compared atorvastatin and rosuvastatin as lipid lowering agents in type II diabetes patients.

II. MATERIALS & METHOD

The present study comprised of 58 patients of type II diabetes of both genders. Enrolment in the study was performed after they agreed to participate.

Demographic information such as name, age, gender etc. was recorded. A thorough clinical as well as laboratory investigation such as fasting, random blood glucose, glycated hemoglobin etc. was done. Assessment of lipid profile was also carried out. Patients were divided into 2 groups of 29 each. Group I received once daily dose of 10 mg atorvastatin and group II received 10 mg rosuvastatin for 8 weeks. Efficacy and safety of drugs was carried out in both groups. Results were statistically analyzed. P value less than 0.05 was considered significant.

III. RESULTS

<table>
<thead>
<tr>
<th>Groups</th>
<th>Group I</th>
<th>Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug</td>
<td>10 mg atorvastatin</td>
<td>10 mg rosuvastatin</td>
</tr>
<tr>
<td>M:F</td>
<td>15:14</td>
<td>13:16</td>
</tr>
</tbody>
</table>

Table I shows that group I had 15 males and 14 females and group II had 13 males and 16 females.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I</th>
<th>Group II</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (Kg)</td>
<td>82.0</td>
<td>83.1</td>
<td>0.92</td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>29.4</td>
<td>28.6</td>
<td>0.94</td>
</tr>
<tr>
<td>LDC- C, mmol/L</td>
<td>4.5</td>
<td>4.6</td>
<td>0.14</td>
</tr>
<tr>
<td>HDC- C, mmol/L</td>
<td>1.3</td>
<td>1.4</td>
<td>0.15</td>
</tr>
<tr>
<td>TG, mmol/L</td>
<td>2.1</td>
<td>2.1</td>
<td>1</td>
</tr>
</tbody>
</table>

Table II, graph I shows that mean weight in group I was 82. Kg, in group II was 83.1 Kg, BMI was 29.4 Kg/m^2 and in group II was 4.6 Kg/m^2, LDC- C was 4.5 mmol/L in group I and in group II was 4.6 mmol/L, HDC- C was 1.3 mmol/L in group I and 1.4 mmol/L in group II and TG was 2.1 mmol/L in group I and 2.1 mmol/L in group II. The difference was non-significant (P>0.05).

Graph I Assessment of parameters
Table III Percentage change from baseline to 16 weeks of parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I</th>
<th>Group II</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDC - C, mmol/L</td>
<td>-52.5</td>
<td>-51.6</td>
<td>0.02</td>
</tr>
<tr>
<td>HDC - C, mmol/L</td>
<td>5.3</td>
<td>4.4</td>
<td>0.14</td>
</tr>
<tr>
<td>TG, mmol/L</td>
<td>-21.4</td>
<td>-21.4</td>
<td>1</td>
</tr>
<tr>
<td>TC</td>
<td>-34.6</td>
<td>-32.1</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Table III shows that mean change of LDC - C, mmol/L was -52.5 in group I and -51.6 in group II, HDC - C, mmol/L was 5.3 in group I and 4.4 in group II, TG, mmol/L was -21.4 in group I and II each and TC was -34.6 in group I and -32.1 in group II. The difference was significant (P<0.05).

IV. DISCUSSION

Diabetic patients tend to have a higher concentration of small dense LDL particles, which are associated with higher CHD risk. Lowering LDL levels is the first priority in treating diabetic dyslipidemia. Statins are the first drug of choice, followed by resins or ezetimibe, then fenofibrate, or niacin. Current evidence and guidelines mandate that diabetic dyslipidemia should be treated aggressively, and lipid goals can be achieved in most patients with diabetes when all available products are considered and, if necessary, used in combination. Treatment of type 2 diabetes requires the agents that act beyond their blood glucose effect. Drug therapy that not only has an effect on blood glucose level but also has a beneficial effect on dyslipidemia, hypertension, obesity, hyperinsulinemia, and insulin resistance is likely to be the most useful therapy in treating type-2 diabetes.

Different statins require different dosing to reach the same LDL level. The lowering of LDL levels with statins varies from 20 to 60%. Therefore, the greatest effects are seen with the most potent statins such as simvastatin, atorvastatin, and rosuvastatin in the higher doses. Besides, majority of diabetic patients are at risk of coronary heart disease and deserve LDL cholesterol lowering to the currently recommended targets. The present study compared atorvastatin and rosuvastatin as lipid lowering agents in type II diabetes patients.

In present study, group I had 15 males and 14 females and group II had 13 males and 16 females. Adsule et al included 60 patients of type-2 diabetes with dyslipidemia having good glycemic control with fixed dose combination of tablet glimepiride + metformin and divided into three groups of twenty each. Group-1 patients have received tablet rosuvastatin 10 mg once daily, group-2 received tablet atorvastatin 10 mg once daily, and group-3 received tablet simvastatin 10 mg once daily for 12 weeks each. The levels of serum cholesterol, serum triglyceride, LDL, VLDL, and HDL were assessed at baseline and at the end of 12 weeks. The mean serum cholesterol, serum triglyceride, LDLc, and VLDLc levels were significantly reduced on therapy (P<0.001). Simultaneously, the mean levels of HDL were highly significantly increased (P<0.001) after therapy for 12 weeks with rosuvastatin, atorvastatin, and simvastatin. Reduction of LDL levels in rosuvastatin group was...
We found that mean weight in group I was 82. Kg, in group II was 83.1 Kg, BMI was 29.4 Kg/m² and in group II was 4.6 Kg/m². LDC- C was 4.5 mmol/L in group I and in group II was 4.6 mmol/L, HDC- C was 1.3 mmol/L in group I and 1.4 mmol/L in group II and TG was 2.1 mmol/L in group I and 2.1 mmol/L in group II. Tonu et al. compared the lipid lowering effect of atorvastatin and rosuvastatin in patients (n=52) with hyperlipidemia. Patients were assigned to atorvastatin 10 mg or rosuvastatin 5 mg daily for 8 weeks. The blood was collected at baseline and after intervention to measure the serum lipid profile. The level of serum total cholesterol in both atorvastatin and rosuvastatin groups was significantly reduced after intervention but no statistically significant difference (p=0.503) was observed between the two statin-treated groups. The reduction of serum triglyceride level was also significant (p=0.046 in atorvastatin group and p=0.0006 in rosuvastatin group). No significant difference was observed between the two groups (p=0.312). The serum LDL-C level was reduced significantly in both atorvastatin group.

We found that mean change of LDC- C, mmol/L was -52.5 in group I and -51.6 in group II, HDC- C, mmol/L was 3.2 and -32.1 in group II. Berne et al. compared the use of rosuvastatin versus atorvastatin in type 2 diabetes mellitus for the reduction of low-density lipoprotein cholesterol (LDL-C) in patients with type 2 diabetes. After a 6-week dietary run-in, patients aged ≥ 18 years with type 2 diabetes and LDL-C ≥ 3.3 mmol/L were randomised to double-blind treatment with rosvastatin 10 mg (n = 232) or atorvastatin 10 mg (n = 233) for 4 weeks. Doses were then titrated up to a maximum of rosvastatin 40 mg or atorvastatin 80 mg over 12 weeks to achieve the 1998 European LDL-C goal (< 0.001). Significantly more patients reached the 1998 LDL-C goal with rosvastatin 10 mg compared with atorvastatin 10 mg at 4 weeks (81% vs 65%, p < 0.001). At 16 weeks, significantly more patients achieved their LDL-C goal with rosuvastatin compared with atorvastatin (94% vs 88%, p < 0.05) and more patients receiving rosvastatin remained at their starting dose with reduced requirement for dose titration. At 4 weeks, 65% of rosuvastatin patients had reached their 2003 European LDL-C goal (< 2.5 mmol/L), compared with 33% of atorvastatin patients (p < 0.0001). Both treatments were similarly well tolerated with no unexpected safety concerns.

V. CONCLUSION

Authors found that rosuvastatin found to be more effective than atorvastatin as lipid lowering agent in type II diabetes.

REFERENCES