A Randomized Controlled Trial Comparing Effect of Atorvastatin and Simvastatin on Renal Outcome in Type 2 Diabetic Patients

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Background: Statin use has been reported to slower eGFR decline and decrease in proteinuria compared to placebo. However, controversy still exists on the differences of renal outcomes among different statins. While, high-intensity statin is recommended in most type 2 diabetic patients.

Objective: To compare the effects of simvastatin and atorvastatin on renal outcomes, with changes in estimated glomerular filtration rate (eGFR) and proteinuria in type 2 diabetic patients.

Methods: We conducted a randomized control trial in type 2 diabetic patients who had no atherosclerotic cardiovascular disease, eGFR more than 60 ml/min/1.73 m², and were taking simvastatin up to 20 mg/day. The patients were randomized to continue using the same dosage of simvastatin for 12 weeks or changed to atorvastatin 40 mg per day for the first 6 weeks, then increased to atorvastatin 80 mg per day during the last 6 weeks if tolerable. Urine microalbumin-to-creatinine ratio (MAU/Cr) and eGFR were assessed at baseline and 12 weeks.

Results: We recruited 120 eligible patients. Of these, 114 patients completed the study and 2 patients lost to follow-up, while 4 patients could not tolerate high-intensity statin. Mean age was 59±9 years and 72.6% were female. Mean baseline plasma LDL level on statins was 70.7±14 mg/dl. There was no significant difference in mean age and plasma LDL level at baseline between simvastatin group (n=59) and atorvastatin group (n=61). Mean plasma LDL levels at 12 weeks were significantly lower in the atorvastatin group than the simvastatin group (LDL 73.5±20mg/dl vs 57.5±26.2 mg/dl; p=0<0.01). Median percentages of changes in eGFR in the simvastatin and the atorvastatin groups were 0.01 (-4.54, 4.19) and -0.09 (-5.61, 6.07), respectively. Meanwhile, median percentages of change in urine MAU/Cr ratio in the simvastatin and the atorvastatin groups were 22.59 (-24.41, 135.39) and -2.22 (-32.41, 93.33), respectively.

Conclusion: There is no significant reduction in eGFR decline between simvastatin and atorvastatin usage at 12 weeks; however, a trend of reduction in proteinuria with atorvastatin treatment is promising.

Keywords: High-intensity statins, Renal outcome, Type 2 diabetes