

## Does statins increase risk of diabetes?

Statins are drugs that inhibit the enzyme 3-Hydroxy-3-methylglutaryl-coenzymeA (HMG-CoA) which is critical in the production of cholesterol molecules. Thus is commonly used in the treatment of abnormally elevated cholesterol which is known to contribute to cardiovascular disease (CVD). Several large scale studies have shown that statins at low or moderate dose decreases CVD events, in patients with even one risk factor for CVD when the calculated 10 year event risk is >7.5%. In addition, Multiple studies have also shown that statins decrease the incidence of CVD events in diabetic patients and the expert panel of ACC/AHA have recommended it's use in all diabetic patients aged 40-75yrs. However, there is a concern that long term statin use may be associated with new onset of diabetes mellitus.

The initial study that reported a correlation between statin and diabetes was the West of Scotland Coronary Prevention Study (WOSCOPS) in 2001. This study actually showed a decrease in incidence of new onset diabetes mellitus in patients who were on statin. The study was done on young male population who had low risk of diabetes and the criteria used to diagnose diabetes was non standardized. However the later, large randomized studies such as Justification for the Use of Statins in Prevention: an Intervention Trial Evaluating Rosuvastatin (JUPITER) actually showed an increase in the incidence of diabetes with statin use compared to placebo. Pooled analysis of the multiple randomized control studies by Rajpathak et al, Sattar et al and Mills et al all showed an increase in incidence of diabetes with statin use. Chou et al for the USPSTF (U.S preventive services task force) analyzed data from the studies which included large number of patients without any CVD events. This was to evaluate statin use in primary prevention of CVD. The pooled analysis showed a decrease in cardiovascular and all cause mortality in the patients who used statins. This meta-analysis did not show any increase in incidence of diabetes mellitus. However if we reanalyze the data after excluding the WOSCOPS trial, there was a slight increase in the incidence of diabetes in patients who were on statins.

Animal models have shown that statins increase production of glucose in the liver, alter immune system to contributing to insulin resistance, decreases cholesterol synthesis which leads to structural changes in the cellular proteins thereby causing a decrease in insulin mediated glucose uptake. These are some of the postulated mechanisms for statin induced elevation in glucose.

It appears the risk of diabetes is higher with higher potency and larger doses of statins. Again multiple studies suggest that statin use worsens glucose control in patients who already has a diagnosis of diabetes mellitus. However whether this translates to an adverse clinical outcome is unknown.

When we compare the risk to the benefit of using statins, it has been reported that for every 255 patients who are treated with statins there was 1 case of new-onset diabetes, but 9 cardiovascular events such as myocardial infarction, stroke or death were prevented. Statins have shown undisputed benefit in decreasing the risk of CVD events in high risk patient groups. However in low

risk patient groups, when used for primary prevention, we recommend that a risk benefit discussion with the patient should guide initiation of statin use.

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## **Publication**

[Balancing Primary Prevention and Statin-Induced Diabetes Mellitus Prevention.](#)

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