Statin-induced diabetes: too sweet a deal?

**Clinical question**
Do statins increase the risk of diabetes, and does this worsen outcomes?

**Bottom line**
Statins modestly increase blood glucose levels, which leads to 1 in 250 or so patients crossing the “diabetic threshold” in a 5-year period. Pre-existing elevated blood glucose levels, other diabetes risk factors, or higher statin doses might slightly increase the risk. This should not change statin prescribing, as statins reduce cardiovascular events and all-cause mortality in appropriate patients.

**Evidence**
- **Statin vs no statin:** meta-analysis of 13 RCTs with 91,140 patients at high risk of or with cardiovascular disease. New diabetes over a mean of 4 years: 4.9% of those taking statins vs 4.5% of the control patients; number needed to harm was 250.
- **High vs moderate- or low-dose statin (eg, 80 mg vs 10 mg of atorvastatin):** meta-analysis of 5 RCTs with 32,752 patients with cardiovascular disease. New diabetes over a mean of 5 years: 8.8% of those in the high-dose group vs 8.0% in the moderate- or low-dose group; number needed to harm was 125.

**Context**
- **Diagnosis of type 2 diabetes** is largely based on crossing an arbitrary laboratory threshold, like fasting plasma glucose (FPG) of 7.0 mmol/L or greater.
- Elevated baseline FPG is a risk factor for developing diabetes with statins.
- In an observational study, FPG increased by 0.1 mmol/L at 2 years in those without diabetes taking statins.
- Thus, the increased diagnoses of diabetes in statin users are likely, in good part, from patients with border-line glucose levels crossing the diagnostic cutoff.
- Despite the increases in blood glucose, statins reduce important clinical outcomes including mortality in patients with appropriate indications.
- In the Heart Protection Study (mostly secondary prevention), for every person newly diagnosed with diabetes due to statin use, 5 deaths, 6 nonfatal myocardial infarctions, and 4 strokes were prevented in 5 years.
- Similar pooled RCT evidence shows an increased risk of diabetes with thiazides and β-blockers vs placebo or other antihypertensive medications.
- Thiazides and β-blockers (in appropriate patients) also provide net benefit.

**Implementation**
Patients concerned about the increased risk of diabetes with statins should have the risk put in context. Statins increase the risk of diabetes by about 11%, while hypertension and obesity increase diabetes risk by approximately 100% and 200%, respectively. Alternatively, it might be explained (using data from the JUPITER trial) that patients receiving statins are diagnosed with diabetes on average about 5 weeks sooner than nonusers. Most important, for every person diagnosed with diabetes due to a small increase in blood glucose they will not feel, 2 to 15 patients (depending on risk) will avoid serious outcomes like stroke, heart attack, and death.

Mr Turgeon is a pharmacist currently completing an additional training residency year in Vancouver, BC. Dr Allan is Associate Professor in the Department of Family Medicine at the University of Alberta in Edmonton.