Reviewer's report

Title: Guidelines adherence in the treatment of patients with newly diagnosed type 2 diabetes: a historical cohort comparing the use of metformin in Quebec pre and post-Canadian Diabetes Association guidelines

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Reviewer: Dereck Hunt

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Review:

The manuscript addresses an important topic, namely adherence to treatment recommendations for patients with diabetes mellitus type 2. The study uses a pre-post design, looking at the rate of metformin use as an initial oral hypoglycemic agent before and after January 1, 2008 (January 20, 2003 to January 1, 2008 v. January 1, 2008 to December 29, 2011). MOXXI, a comprehensive electronic health record and clinical information system, was used to identify medication prescription rates.

The primary weakness of the study relates to its use of a pre-post design, and the subsequent inference of a causal effect of the publication of the CDA Diabetes Care Guidelines in September 2008. While all individuals involved with the 2008 guidelines (including myself) would like to think that the guidelines significantly impacted physician behaviour, numerous other factors may have influenced prescribing patterns.

Major Compulsory Revisions

An analysis showing metformin prescription rates over smaller time intervals (e.g. 12 months) would be informative. While not overcoming the causality issue, this analysis would demonstrate whether metformin prescription rates gradually rose from 2003 to 2011 (possibly as a result of the UKPDS study), or rather were very consistent from 2003 to 2008, and only rose subsequently.

An analysis of metformin prescription rates for obese v. non-obese individuals would also be very valuable. As the authors indicate, the only change in the 2008 guidelines was to recommend metformin as a first-line agent for individuals with a BMI of <25. Previous guidelines had recommended metformin for people with a BMI of >25.

The authors should comment on the presence or absence of any physician oriented educational campaigns (or other initiatives) highlighting the importance of avoiding hypoglycemia and weight gain in people with diabetes, interventions that would be expected to decrease sulfonylurea prescribing rates. The authors should also comment on any educational sessions highlighting the 2008 guidelines.
In the abstract, the first sentence in the results paragraph is misleading as it suggests a much larger change in prescribing rates than was in fact observed. Many readers will not be familiar with important differences between a relative risk and an odds ratio. Reporting the absolute metformin prescribing rates (89.7% v. 94.6%) would be preferable.

In the abstract, the “conclusions” paragraph is too suggestive of a causal link between observed prescribing rates and the 2008 guidelines. The conclusion should more clearly indicate that a temporal association was observed, that may or may not have been causal.

In the Results section (Metformin use pre vs post guideline), the first sentence should be limited to “After the publication of the new CDA guidelines, there was an absolute increase in incident use of metformin of 4.9% (pre-guidelines 89.7%; post-guidelines 94.6%) (Table 2).” The authors should provide a 95% confidence interval for the change of 4.9%. The (new) second sentence should read “Metformin use increased even after adjusting for patient and physician characteristics (OR: 1.86, 95% CI 1.20 – 2.90). Writing that metformin use increased by 86% will mislead many readers.

In the discussion section, in the first sentence, the word “affected” should be changed to “was temporally associated with”. A similar change should be made to the first sentence in the “Strength and Limitation” section.

Minor Essential Revisions
In the last sentence of the first paragraph of the background, the authors should change “every five years” to “regularly” and “few researches published” to “published studies”.

In the “Discussion” section, second paragraph, 5th sentence, the word “medication” should be changed to “medications”.

In the “Strength and limitation” section, first paragraph, the word “prescription” in the 3rd sentence should be “prescriptions”.

The "Strength and Limitation" section should be renamed "Strengths and Limitations".

Discretionary Revisions: nil.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests:

I declare that I have no competing interests.