Reviewer's report

Title: Antihyperglycaemic treatment patterns, observed glycaemic control and determinants of treatment change among patients with type 2 diabetes in the United Kingdom primary care: a retrospective cohort study

Version: 3

Date: 14 June 2014

Reviewer: Martin Gulliford

Reviewer's report:

This paper analyses utilisation of oral hypoglycaemic drugs among diabetes patients in the UK registered with the CPRD. The study focuses on predictors of treatment switching or augmentation. The findings are of interest because of the frequency of the condition and the high costs of OHA use.

Major revisions

The main statistical analysis has been done using multinomial logistic models with odds ratios as the main measure of association. The paper notes 'Multinomial logistic regression models were applied to estimate the association between each covariate and the likelihood of each of the treatment outcomes as compared to no change in treatment during the timeframe of interest. The timeframes for which models were applied included the baseline period (first six months after index date) and yearly intervals since index. It was not possible to execute the models for time periods beyond one year since index date due to the decreasing numbers of patients over time.'

In the CPRD data observations may be censored either at left or right as patients enter and leave the database. Analysis in a time to event framework would be more usual. This would overcome some of the difficulties encountered. As a minimum, if a logistic model is to be used then the paper needs to justify this, and explain how many days in a year were required for patients to be considered at risk.

It would be optimal to take into account clustering by general practice, since treatment decision may be correlated within practices. The confidence intervals presented may be artificially narrow. In Stata the 'svy set' or 'robust, cluster' options may be used.

The main results are of interest, but I did not find these surprising. The paper might emphasise the novelty of the results. Data on drug selection at the augmentation stage would be of interest, particularly in terms of the use of newer drugs.

The paper should avoid words that suggest causation. For example, 'association' would be a better word than 'influence'.
The lines in Figure 2 are not sufficiently labelled. Also, it is not clear that the same patients have increased HbA1c values at each time point, which is implied by the graph. The text should perhaps note some reservations about constructing these subgroups, as there may be problems with the initial measure. It does not seem necessary to include the histogram in either Figure 1 nor 2.

Minor revisions

In the introduction it reads 'Our objective was to identify determinants of initial treatment change following initiation of non-insulin antihyperglycaemic treatment for UK patients with T2D.'

The first use of the word 'intial' is redundant,

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

'I declare that I have no competing interests'