Reviewer's report

Title: Prevalence of self-reported early glaucoma eye drop bottle exhaustion and associated risk factors: A patient survey

Version: 1 Date: 12 December 2013

Reviewer: Heidi Cate

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Major compulsory Revisions
1. This manuscript has not been prepared with an international audience in mind and is specific to the USA healthcare system. Therefore, information should be added to the introduction to help the reader understand the scale of the problem and prescribing difficulties that patients face in the USA and why this study can help address that.

2. There is a lack of clarity in the aims and objectives of this study. The introduction states “we examined the prevalence of early exhaustion of glaucoma eye drops prior to a scheduled refill and associated risk factors” however I am not sure that visual acuity and visual field loss are actually ‘risk factors’ and perhaps ‘predictors’ of early exhaustion of glaucoma eye drops is a more appropriate term as causality has not been established. It would suggest that having a poor visual acuity causes participants to run out of drops, but there is not enough evidence in the study outcomes to make this claim. Further, glaucoma does not affect visual acuity (VA) and there is no explanation or discussion as to why this measure was chosen to be correlated with eye drop bottle exhaustion? Presumably participants with poor visual acuity had an ophthalmic comorbidity accounting for the reduction in VA, but this has not been reported. It might therefore be assumed that the severity of glaucomatous disease was attributable to poor VA and this should be clarified.

Glaucoma does however affect visual field loss and it is therefore understandable why visual field loss has been correlated with early bottle exhaustion. But again, this would not make it a risk factor, merely a potential predictor that a patient with visual field loss might use more eye drops? However participants unable to complete a visual field analysis were included in the study and therefore lack of available data meant no meaningful analysis could be carried out on this aspect.

The consequences of this means that this is a study to establish prevalence of self-reported early glaucoma eye drop bottle exhaustion and it cannot make any further claims about associated risk factors and should not be included in the study title.

3. It is a shame that the study questionnaires were not designed and validated with patient involvement. It is evident that the questionnaire needed further testing and more options added for reasons for eye drop bottle exhaustion by the fact that 43% of the responses were reported under “other”. This may also
suggest an under-reporting of the relevant issues affecting patients about exhaustion of the eye drops. In addition, although patients were specifically told that this was a study about early bottle eye drop exhaustion, the fact that these are the only questions within the questionnaire would instantly highlight this issue to patients and would suggest it was the only barrier to adherence that the authors were interested in, inadvertently adding a mere measures bias to the data collected.

Furthermore, whilst the questionnaires ask how often participants run out of drops and why they run out of drops, it does not ask how long patients are therefore without medication and this is the key question for non-adherence to medication. Do they run out of medication for one day, one week, or longer and it is this outcome that is the potential risk factor for glaucoma progression.

Minor essential revisions
1. Of the patients who declined, what was their reason for declining participation?
2. Table 1 needs better labelling, is it ‘number’ of eye drop bottles, ‘number’ of comorbid conditions and ‘number’ of prescription medications?
3. Please define what is meant by ‘diagnosis of glaucoma’, how was this assessed and what criteria was used to categorise potential participants?
4. In the introduction please add why, if patients run out of eye drops, do they not go a collect new bottle? In the relevant healthcare system do they have restrictions that would prevent them doing so? If so, is the relevance of the study to inform healthcare providers to dispense more bottles of eye drops? It is not clear as to what relevance the study outcome has on adherence to medication.
5. There is a grammatical error in the second sentence of the discussion.

**Level of interest:** An article of limited interest

**Quality of written English:** Needs some language corrections before being published

**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.