Reviewer's report

Title: Driving patterns in older adults with glaucoma

Version: 2 Date: 19 September 2012

Reviewer: David Crabb

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I’m very sorry for my late review!

The paper titled: "Driving patterns in older adults with glaucoma", is a concise and clearly-written paper, which provides a very useful contribution to current research in how glaucoma affects driving habits - it is the first to present a link between driving cessation and defect severity, for instance. Though it is already a good article, there are a few questions and recommendations I have for the paper to help maximise its quality.

So, the following are ALL Minor Essential Revisions

Abstract
- The second sentence of the Abstract introduction could be made clearer with the addition of the word "age": "...in this age group..."

Introduction
- Given that driving cessation is a definite state (one is unlikely to repeatedly stop driving), I suggest that the wording of the first sentence of the abstract conclusion be changed from "...more frequent driving cessation..." to "higher likelihood of driving cessation".

Methods
- I was a little perplexed by the sentence beginning: "Most glaucoma subjects had 24-2 VF tests within the 15 months prior to enrolment...". Some more detial is needed here..especially in those where a VF had not been taken.

- It is not clear (to me at any rate!) what the questionnaire referred to at the beginning of the "Evaluation of Driving" section is. Only three of the nine driving limitations are referred to in reference 17 and it is not clear that the questionnaire has been standardised there either.

- Furthermore, for limitation [9] 5000 miles rather than 3000 miles (as in the aforementioned Freeman paper) is used for one of the standards and an explanation for this is necessary.

- What was the rationale behind selecting the 4 states for limitation [1] (it's hard to judge as an Englishman, but New Jersey seems to be almost near to Baltimore as the Virginia border, whilst West Virginia is a neighbouring state). Would patients regard the District of Columbia as being inclusive in this 4 state region?
- It would be helpful to use different parentheses around the limitation numbers, so they are distinct from the references.

- Has the limitation list undergone a Rasch analysis to assess the suitability of adding them together for a representation of limitation, as utilised in the analysis? Please reference the psychometric study of the questionnaire’s properties if so, or perhaps mention this as limitation in the discussion.

- At the end of the "Measurement of vision and covariates" section, is the questionnaire referred to the General Health Questionnaire or the same one as described previously (i.e. the Freeman questionnaire)? A little more clarity regarding what questionnaires were used would be helpful. The manuscript is a little confusing here.

Tables and Figures
- Judging by the IQR, the distribution of MD values in Table 1 do not appear to be normally distributed, so this variable should either be transformed to use the t-test or else a non-parametric test such as the Wilcoxon should be used (this is unlikely to affect the results).

- In Figure 1, it is unclear where the median is located (is it equal with the upper quartile or the lower quartile?). Furthermore, the text where the figure is referenced does not correspond with the figure itself. The figure shows the "Number of driving limitations by severity of better-eye visual field loss", whilst the text suggests that: "Glaucoma subjects also had a greater mean number of driving limitations (2.0 vs. 1.1, p=0.004) (Figure 1)". In other words, the text refers to a control-patient comparison, whilst the figure itself is geared towards severity of loss for that patient group. Furthermore, it is unclear why the groupings of VF defects differ from those used in the study (gaps of -5dB as opposed to 0--3, -3--6, -6--12 and under -12 groupings). Given the fact that the medians for each group look very similar (should the median equal the lower quartile in the under -12dB group), the authors may decide that including this figure is not worth including in the paper. I think if the authors want to keep this figure, then they should reference the results it presents in the Results section (namely stating that those with more driving limitations tend to have more advanced visual field defects).

- I would be interested to know why decrements of 5dB were used instead of a continuous measure of MD for VF loss in the study. This does not matter a great deal, but it would be interesting to know given that Figure 2 seems to have utilised MD as a continuous measure.

Results
- It would perhaps be worthwhile to remind the reader what is being adjusted for in the multivariate analysis within the Results section itself.

-Table 2 – Why not round up the % values to whole numbers, especially since the sample size is small.
Discussion

- The sentence at the bottom of page 9 states: "The discrepancies between different studies suggest that driving adaptations to VF loss may be different across different age groups or in different driving environments (i.e. urban vs. rural)." It would be helpful if this point was elaborated on. Is this judgement based upon these factors not being adjusted for in studies that show affirmative results or, more likely, the fact there has been no explainable difference between studies with different results other than study location and age demographic?

- It would benefit the discussion if the authors expanded the middle paragraph on page 10. I would like the authors to state why they believe that glaucoma nor severity of loss did not predict driver deference in the study. I would guess that the explanation would simply be that they aren't related, so perhaps the following could be added to the end of the last sentence: "...current study, which may imply that glaucoma is not a factor influencing deference outside of other more significant factors such as gender..." etc. Alternatively, the authors may feel that any effect caused by glaucoma may be small, which means that more patients would be required to have the power to find such an effect.

- In the discussion it would be very useful to add a paragraph about other ways in which driving performance in patients with glaucoma has been assessed of late. For example, it would be good if the authors very briefly discussed some of these


I’d also like to see a little discussion about the advantages (and problems) of measuring the binocular VF and its association with driving performance or legal fitness to drive....And the potentials to predict what drivers might have a problem given their progression characteristics in the clinic

Some useful refs to consider and briefly discuss should include:


The latter might be particularly interesting in this context.

There are also a few typographical errors worth mentioning:

.. the use of the word "asses" instead of "assess" in the Abstract and Manuscript Discussion.

I think the last word of the introduction should be "severities" instead of "severity".
The "Subjects" section of the methods
There is a typo in the Discussion and Conclusions heading: "Disucssions..."
The last sentence of the first paragraph on page 10 should either begin "Additional studies are needed..." or "An additional study is needed", rather than "Additional study is needed".
There is a full stop missing in the sentence: "Females were more likely to limit their driving[14,16,17]."

**Level of interest:** An article of outstanding merit and interest in its field

**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