Reviewer's report

Title: The Glaucoma Initial Treatment Study: Comparing the effectiveness of selective laser trabeculoplasty with topical medication as initial treatment: study protocol for a randomized controlled trial

Version: 2 Date: 1 June 2015

Reviewer: Jay Katz

Reviewer's report:

Lamoureux et al. describe the study protocol of The Glaucoma Initial Treatment Study, a study comparing the effectiveness of SLT with topical medication as initial treatment.

The study protocol is well written, and the study design will adequately test the hypothesis suggested. There are sufficient details provided to allow replication of the work or comparison with related analyses, and the statistical analysis is appropriate. The figures appear to be genuine.

- Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached):

- The discussion section is missing. Parts of the introduction could be moved to the discussion section.

- Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

- Background, Page 3, last paragraph: “Whilst the exact mechanism underlying the effectiveness of laser trabeculoplasty remains uncertain, it induces trabecular endothelial cell division and, in some instances, may create burns which result in contraction and subsequent stretching of the trabecular meshwork”. The authors should provide a more accurate description of recent theories on the presumed underlying mechanisms of SLT for example the cellular/macrophage and biochemical signaling with loosening cellular adhesion in the trabecular meshwork. Thermal burns may occur in ALT, not SLT, which is the main focus of this study.

- Objectives and Hypotheses, Page 5, 2nd paragraph: “We hypothesise that treatment with SLT, compared with topical medication, will … show greater IOP reduction…” Based on previous studies, you should expect similar, not greater, IOP reduction compared with medications. Perhaps more modest IOP reduction with SLT since the initial step is treatment over 180 degrees and only completing the other 180 later as needed.

- Figure 1: The abbreviations 6/52, 12/52 and 3/12 are not clear. It would be more easily read as “6 weeks”, “3 months” etc.
- Figure 1: Please explain more clearly what “exit ¥” means.
- Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore)
- Page 7 – “Initial 180# treatments of approximately 50 applications will be applied inferiorly from the 3 to 9 o’clock position.” Why not performing 360 degrees SLT first, which is probably more likely to result in greater IOP reduction?

**Level of interest:** An article of importance 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:**

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