Author's response to reviews

Title: Viscoat versus Visthesia during phacoemulsification cataract surgery: corneal and foveal changes.

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Author's response to reviews: see over
Dear Editor,

I am sending for publication to your distinguished Journal the revised version of the Research Article entitled: “Viscoat versus Visthesia during phacoemulsification cataract surgery: corneal and foveal changes.”

Please find throughout the following pages our point-to-point response to reviewers’ comments, as well as our answer to editorial request.

All changes in the manuscript were highlighted in red.

I declare that:

i) the content of this paper has not been published or submitted for publication elsewhere

ii) all authors are in agreement with the content of the manuscript

iii) there is no financial support or relationship that may pose conflict of interest.

Yours sincerely,

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Reply to reviewers’ comments

Reviewer: Miltiadis Tsilimbaris

In this paper Moschos et. al compare two viscosurgical devices (OVD) measuring their impact on central corneal thickness, endothelial cell count, macula thickness and visual acuity after phacoemulsification cataract surgery. They compare a dispersive OVD (Viscoat) with a cohesive one combined with lidocaine (Visthesia). They conclude that the dispersive OVD leads to less corneal thickness and less endothelial cells loss, while visual acuity improves the same with both devices. They also found that macular thickness increases in the group of Visthesia. The work is well contacted and the information provided is useful. However some things need to be improved before publication.

We would like to thank you for your valuable comments. We have tried to revise the manuscript according to your instructions. Please, find all changes throughout the manuscript in red.

1. Although the two devices have obvious differences based on the fact that one is cohesive and the other dispersive, it seems that their main difference is related to the presence of lidocaine in Visthesia. Authors need to address better this fact in the background section and to add some more information concerning advantages, disadvantages and effects of intracameral anesthetics.

We would like to thank you for your comment. We have added in the background section the phrase: “It is worth mentioning that the mixture of an OVD with an anaesthetic (viscoanaesthesia) may provide more comfort to patients and makes the application of the anaesthetic easy. However, the addition of lidocaine in classic OVDs may prolong the toxic effect of lidocaine on the corneal endothelium.” (page 4, lines 21-24).

2. The comparison would be more clear if they had chosen to compare two OVDs with the same physicochemical and rheological properties, one with and the other without lidocaine. This should be reported as one of the limitation of this study in the results section.

We have changed the text, as indicated. Please be kind enough to note that the comment has been added in the discussion section instead in the results, as appropriate (page 13, lines 13-18).

3. In Methods the authors report that one patient developed cystoid macular edema, meaning a considerably high macular thickness. Why did they choose to exclude him?

We chose to exclude the patient who developed cystoid macular edema, because this patient exhibited posterior capsule rupture during phacoemulsification and we included only the cases of uneventful phacoemulsification cataract surgery. We have added this comment in Methods (page 6, lines 6-7).
4. Also in Methods it is stated that "after the completion of surgery, patients were asked to rate their pain on a visual analog scale (VAS, range: 0-10)". Some more details concerning the pain measurement methodology and the tool utilized need to be added.

In specific, for VAS rating, we used a vertical line of 10 cm length. One (bottom) end of the line was marked as zero pain and the other (top) end of the line was marked as maximum pain. After instructing patients that the bottom end of the line represents no pain and severity of pain increases as you go along the line and reaches maximum pain at the top of the line, patients were asked to mark the point in the line which represented the severity of their current pain. Then distance from the bottom end of the line to the point marked by the patients was measured in millimeters and the value was taken as the pain score.

We have added this comment in Methods (page 7, lines 9-16).

5. Some more discussion concerning the possible pathophysiological mechanism of macular thickening need to be added in Discussion together with some literature review (e.g. Johansson M, Lundberg B, Behndig A. Optical coherence tomography evaluation of macular edema after phacoemulsification surgery with intracameral mydriatics. J Cataract Refract Surg. 2007 Aug;33(8):1436-41).

We have added in the Discussion two pathophysiological comments, so as to further elaborate on the underlying mechanisms. At the first comment (page 12, lines 14-16), the study by Johanson et al. has been incorporated in the revised text, whereas the second comment (page 13, lines 8-12) has addressed findings coming from experimental work on rabbits.
**Reviewer:** Choun-Ki-Joo

1. *The lidocaine hydrochloride included in Visthesia may affect this result. It must be added the additional comment or reference for the endothelial toxicity of lidocaine in discussion.*

   We would like to thank you for your insightful comments. We have changed the text, according to your suggestion, elaborating on the endothelial toxicity of lidocaine. (page 13, lines 8-12). We have also added the respective references.

2. *Postoperative assessment of intraocular pain may have the possibility of recall bias. And the patient can feel intraocular pain differently whether the operated eye was first or second eye. Could the pain score be affected by operation time?*

   All eyes were the first to be operated, in order to avoid heterogeneity; this has been declared in the revised Methods (page 5, lines 13-14).

   In addition, the possibility of recall bias interfering with intraocular pain may not be ruled out, but has essentially been minimized as patients were asked to rate their intraoperative pain immediately after surgery (page 7, line 8). We have included your remark as a limitation of our study (page 13, lines 18-20).

   Intraoperative pain was not affected by operation time; we have proceeded to the necessary statistical tests which did not yield any significant association (page 10, lines 6-8).
**Editorial request**

*Could you please include the name of the ethical committee which gave ethical approval for this study in the Methods Section.*

The institutional review board of “G.Gennimatas” General Hospital of Athens has approved our study. We have added the name of our hospital in Methods (page 6, lines 9-10).