

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Preoperative refraction, age and optical zone as predictors of optical and visual quality after advanced surface ablation in high myopic patients: a cross-sectional study
AUTHORS	Zhou, Jiaqi; Xu, Ye; Li, Meiyang; Knorz, Michael; Zhou, Xingtao

VERSION 1 – REVIEW

REVIEWER	Jose R Jimenez Department of Optics. University of Granada. Spain
REVIEW RETURNED	12-Sep-2017

GENERAL COMMENTS	<p>This paper is a surprise for me. It needs a substantial and major revision before publishing.</p> <p>I find a severe concern: background, discussion, references and variables studied are not updated. Very important references and analysis from them are not included and they are completely necessary.</p> <p>When you talk about high myopia and visual quality you must take about many factors: algorithm, corneal asphericity, physical factors...that are not shown in the paper and that justify the results. Literature about LASIK and high myopia is also important for justifying the results. Ablation algorithms are the same.</p> <p>I include a list of publications (a summary) to be read by authors. This will help them to change background and discussion. Once they have modified substantially the paper it could be possible to review the paper.</p> <p>-General papers and for reviews:</p> <p>-Theoretical analysis of the effect of pupil size, initial myopic level, and optical zone on quality of vision after corneal refractive surgery. A Alarcón, M Rubiño, F Pérez-Ocón, JR Jiménez. Journal of Refractive Surgery 28 (12), 901-</p> <p>-Q-optimized algorithms: Theoretical analysis of factors influencing visual quality after myopic corneal refractive surgery. JR Jiménez, A Alarcón, RG Añera, LJ del Barco. Journal of Refractive Surgery 32 (9), 612 2016</p> <p>-Hyperopic Q-optimized algorithms: a theoretical study on factors influencing optical quality JR Jiménez, A Alarcón, RG Añera, LJ Del Barco. Biomedical Optics Express 8 (3), 1405-1414 2017.</p> <p>-Experimental data on medium and high myopia and asphericity: Añera, JR Jiménez, LJ Del Barco, J Bermúdez, E Hita. Journal of Cataract & Refractive Surgery 29 (4), 762-768 154 2003</p> <p>-Corneal asphericity</p> <p>Corneal asphericity after refractive surgery when the Munnerlyn formula is applied. JR Jiménez, RG Añera, JA Díaz, F Pérez-Ocón</p>
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	<p>JOSA A 21 (1), 98 2004.</p> <p>-Halos</p> <p>-Night vision disturbances after successful LASIK surgery. C Villa, R Gutiérrez, JR Jiménez, JM Gonzalez-Méijome. British journal of ophthalmology 91 (8), 1031 2007</p> <p>-New testing software for quantifying discrimination capacity in subjects with ocular pathologies. JJ Castro, JR Jiménez, C Ortiz, A Alarcón, RG Anera. Journal of biomedical optics 16 (1), 015001-015001-7 2011.</p>
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REVIEWER	Rafael J. Pérez-Cambrodí Ofalmar. Vithas Hospital Internacional Medimar. Alicante (Spain)
REVIEW RETURNED	15-Sep-2017

GENERAL COMMENTS	<p>Although this is an interesting topic and this paper is focused on the visual quality pattern of high myopic patients after different procedures of surface refractive surgery, there is a lot of misunderstandings and, in my opinion, some ethical doubts in its design. Regarding the selection patients and taking into consideration the lower limits of ranges of refraction and pachymetry, authors performed laser refractive surgery in patients with a SE higher than -8 D and a pachymetry less than 450 microns. Even with a 5-mm optical zone, the ablation would be over 80 microns. I'm sure authors are aware of phakic IOLs for those patients. Authors should mention that other procedures can lead to a better visual quality outcomes.</p> <p>Regarding the use of bandage contact lenses, authors reported 3 to 7 days for complete epithelization. Recent research recommend longer periods. In my experience, 3 days is not enough period to ensure a complete recovery of the epithelium.</p> <p>Regarding the Zernike coefficients, I thought that Z(0,4) was the primary spherical aberration index. I haven't found in the whole text the meaning of this coefficient. Authors should clear what are they talking about and highlight it in the text and tables.</p> <p>There is no interest in reporting 3-mm pupil diameter HOAs. Authors concluded that the lower optical zones applied in young patients, the higher level of HOAs. This is because of the pupil diameter. There's not explanation for the increased coma-like aberration (maybe the centration?, Was it designed to fix the optical axis?). Rewrite the methods section mentioning which was the chosen method for the beam centration.</p> <p>However, I think CS results are interesting. I encourage authors to rewrite the article, but not only the English language, but some concepts and the methodology should be redefined.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1

Background, discussion, references and variables studied are not updated. Very important references and analysis from them are not included and they are completely necessary.

Response: We appreciate and thank for the reviewer's careful review. We have read the important available references and revise the background and discussion. The important articles reviewer provided were included in the revised manuscript.

Reviewer 2

1. Regarding the selection patients and taking into consideration the lower limits of ranges of refraction and pachymetry, authors performed laser refractive surgery in patients with a SE higher than -8 D and a pachymetry less than 450 microns. Even with a 5-mm optical zone, the ablation would be over 80 microns. I'm sure authors are aware of phakic IOLs for those patients. Authors should mention that other procedures can lead to a better visual quality outcomes.

Response: Thank for the reviewer's suggestion. There are many high myopia patients receive refractive surgery in China every year. Some of them fear of intraocular surgery, and they preferred to choose surface ablation to reduce their refractive error. For myopic patients with thin cornea, we examined the anterior OCT and found the epithelium thickness were about 40-50um. In order to keep the safety, only those with predictable residual stromal corneal thickness over 300um received the procedure.

2. Regarding the use of bandage contact lenses, authors reported 3 to 7 days for complete epithelization. Recent research recommend longer periods. In my experience, 3 days is not enough period to ensure a complete recovery of the epithelium.

Response: In our institution, there are over six thousands patients received advanced surface ablation per year. With the advanced surface ablation, alive corneal epithelial flap, which may speed the epithelium recovery, can be got in the surgery procedure. Some references also report the similar recovery period. (eg: 1. Dai J, Chu R, Zhou X, et al. One-year Outcomes of Epi-LASIK for Myopia. J Refract Surg. 2006; 22(6):589-595. 2. Matsumoto JC, Chu YS. Epi-LASIK update: overview of techniques and patient management. Int Ophthalmol Clin. 2006;46(3):105-115.). We have given the clearer expression with the bandage contact lenses in the revised article as "The contact lens was removed when epithelialization was complete (usually between postoperative days 3 and 7).".

3. Regarding the Zernike coefficients, I thought that Z(4,0) was the primary spherical aberration index. I haven't found in the whole text the meaning of this coefficient. Authors should clear what are they talking about and highlight it in the text and tables.

Response: Thank for the reviewer's suggestion. Z(4,0) was the Zernike coefficient of spherical aberration. We have corrected it in the revised paper.

4. There is no interest in reporting 3-mm pupil diameter HOAs.

Response: We thank the reviewer for careful reading of our manuscript and delete most of 3-mm pupil diameter HOAs discussion. We have rewrite the discussion section.

5. Rewrite the methods section mentioning which was the chosen method for the beam centration.

Response: Thank for the reviewer's critical reading of our manuscript. We have rewrite this chosen method as "As the patient focuses on a fixation light, the excimer laser energy was delivered to the cornea in the optical axis. " for the beam centration to the methods section.

VERSION 2 – REVIEW

REVIEWER	Jose R Jimenez University of Granada. Spain
REVIEW RETURNED	13-Nov-2017
GENERAL COMMENTS	accepted
REVIEWER	Rafael Pérez Cambrodi Vithas Hospital Internacional Medimar. Spain
REVIEW RETURNED	26-Nov-2017

GENERAL COMMENTS	All the questions have been adequately solved
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VERSION 2 – AUTHOR RESPONSE

1. The title has not been revised appropriately. “Multivariate analysis” is the type of data analysis, not the study design.

Response: We have revised the title as “Preoperative refraction, age and optical zone influencing optical and visual quality after advanced surface ablation in high myopic patients: a cross-sectional study”.

2. Please improve the abstract. We would be grateful if you could use the (applicable) sub-headings suggested in our instructions for authors for research articles:
<http://bmjopen.bmj.com/pages/authors/#research>. The study setting also should be included.

Response: Thank for the editor’s suggestion. We have use sub-heading and add the study setting in our revised abstract.

3. You refer to “influencing factors” in the title. What factors are you referring to here? Can you also be more specific in the abstract and introduction when you refer to “factors” affecting visual quality?

Response: We have improved the title, abstract and introduction to specify the influencing factors.

4. We still feel that the quality of English needs improving in places before publication.

Response: Thank for the reviewer’s suggestion. We have improved the language in the revised paper.