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LETTER

Axial Length Correction in Evaluation of Refractive Predictability and Biometry Agreement [Letter]

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Dear editor

We read with great interest the article by Gjerdrum et al concerning the comparison of refractive predictability between different biometers.[1] Analysis of both group refractive index (GRI) and single refractive indices principles is fascinating. However, we would like to make a few comments regarding some points of the study that need to be clarified.

Authors correctly listed some causes of postoperative refractive errors, such as inaccurate prediction of corneal power[2] and axial length (AL). We totally agree, but we ask ourselves why the authors forgot to mention the AL reliability due to lens opacity or the corneal thickness/AL ratio in their work. In fact, as the authors evaluated patients undergoing cataract surgery, lens opacity could affect GRI biometers reliability, as demonstrated by De Bernardo et al.[3] They proposed a correction factor (ALc) to improve the AL measurement reliability which can eliminate any systematic error resulting from the biometer. Since authors analyzed two biometers based on GRI, authors should have taken in consideration ALc for these instruments. Lacking AL correction in GRI biometers could explain the AL differences in extreme values compared to sum-of-segments biometer, especially in long eyes, as noted by the authors in this paper.[1,3]

Authors also declared that they used optimized constant for Lenstar and after they reduced the mean arithmetic (ME) refractive prediction error (RPE) to zero for each device, surgeon and IOL. We have some concerns in this regard. Firstly, also ME obtained with Lenstar is different from zero, as reported in Table 1. In addition, authors did not report how many eyes were analyzed for each IOL model. This is crucial missing information, because to perform an acceptable optimization at least 3 cases for each IOL model should be listed.[4] Moreover, we wonder why also toric IOLs were included.

This study focused on AL reliability, but different RPE obtained by Argos and Anterion were caused by keratometric readings. In fact, these biometers utilize different technologies and diameters to evaluate keratometry. Anyway, optimization of the process could mute every difference between instruments in refractive predictability. Since this process aims to eliminate the systematic error, including optical biometer,[5] we wonder if it could be considered correct to optimize formulas for each biometer in a study that aims to analyze differences between these devices.

We have some concerns also regarding the statistical analysis. No data normality check and statement of statistic test used to compare percentages were presented, so, we are surprised by the analysis of subgroups consisting of only 10 or 11 patients! This is in contrast with a minimum sample size of 22 eyes calculated by the authors. For this reason, the analysis of subgroups that comprehend less than the minimum sample size can be misleading. In this scenario, it could be preferable to analyze data according to quartile ranges to have equal subgroups, as carried out by other recent studies.[2] Results obtained with this subgroups analysis cannot be considered "uncertain", as reported by the authors: they should be considered merely "not evaluable".

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