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LETTERS TO THE EDITOR

Comment on: Comparison of the ocular ultrasonic and optical biometry devices in different quality measurements

Dear Editor

We read with keen interest the recently published study titled "Comparison of the Ocular Ultrasonic and Optical Biometry Devices in Different Quality Measurements" author by M. Khorrami-Nejad.[1] We wish to commend the authors for their invaluable contribution to the field of ophthalmology. The study explores the comparability of axial length (AL), anterior chamber depth (ACD), and lens thickness (LT) measurements obtained from the IOLMaster700 optical biometer and the Echoscan US-4000 ultrasound biometer. While we appreciate the authors' efforts, we would like to raise some questions and suggestions for further analysis.

Standardized Classification for Quality Measurements: The study introduces a novel approach for classifying the quality of measurements based on the standard deviation (SD) of AL measurements. This classification lacks standardization and may not be universally applicable. Future research could explore the development of a more widely accepted and standardized classification system for measurement quality.[2]

Variability in Cataract Types: The study does not take into account the various types and stages of cataracts that patients may have. Different cataract types could impact the quality of measurements differently. Future research could investigate how various cataract types influence the reliability and agreement of measurements.[3]

Effects of Cataract Density: Cataract density, or the severity of cataracts, was not considered in this study. The density of cataracts can vary among patients and might affect the quality of measurements differently investigating the relationship between cataract density and measurement reliability could be a valuable research direction.[3]

Comparisons with Other Biometric Devices: The study primarily compares measurements between the IOLMaster 700 and the Echoscan US-4000. Future research could extend these comparisons to include other commonly used biometric devices. This would help assess the generalizability of the findings to a broader range of devices.

Influence of Patient Characteristics: The study briefly mentions that the age of patients might affect the reliability of measurements. Further research could explore the potential influence of other patient characteristics, such as lens opacities, ocular diseases, or ocular biometry history, on measurement reliability and agreement.

Clinical Implications: The study does not discuss the clinical implications of the observed differences in measurements between the two devices. Future research could investigate how these differences might impact cataract surgery outcomes and IOL power calculations.

Repeatability and Interexaminer Analysis: The study lacks interexaminer repeatability analysis. Future studies could assess the repeatability of measurements taken by different examiners to evaluate potential sources of measurement variability. Standardization of this procedure in order to achieve higher test reliability might be the aim of relevant future studies, although there are a number of points that have to be addressed.[4]

We believe that the authors' commitment to advancing optometry and ophthalmology will lead to further research and improvements in the field. Your guidance and consideration of these suggestions would be highly valuable in ensuring the study's continued impact and relevance.

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Suraj Kumar Chaurasiya[a], Mahendra Singh[a,*], Jayant Jha[b], Radhika[c]

[a] *Department of Optometry and Vision Science, CL Gupta Eye Institute, Moradabad, Uttar Pradesh, 244001, India*
[b] *SJ Vision Foundation, Muzaffarpur, Bihar, India*
[c] *Department of Optometry and Vision Science, Uttaranchal (PG) College of Bio-medical Sciences and Hospitals, Dehradun, Uttrakhand, 248002, India*

[*] Corresponding author at: C L Gupta Eye Institute, Ram Ganga Vihar Phase II (Extn.), Moradabad, Uttar Pradesh, 244001, India.
E-mail address: optommahendrasing@gmail.com (M. Singh).

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Reply to Comment from Chaurasiya et al. on: Comparison of the ocular ultrasonic and optical biometry devices in different quality measurements

Dear Editor,

We appreciate the authors' interest in our recently published article.[1] We would like to take this opportunity to articulate our thoughts and address the concerns arising from this matter.

Regarding the classification method in our study, firstly, it is important to underline that our study represents pioneering work in this field. As such, there were no pre-existing, validated classifications for quality measurements. Secondly, the objective of our study was not to create a method to classify quality measurements. Instead, our primary focus was to compare the performance of ocular ultrasonic and optical biometry devices across various quality measurements. Thirdly, the IOLMaster 700 employs the Standard Deviation (SD) index to validate its metric measurements. We used this index exclusively for categorizing the measurements based on their quality. It is crucial to emphasize that our study was a consecutive case series involving 239 candidates for cataract surgery. Therefore, our classification can indeed be seen as representative of the general population of cataract surgery candidates. This includes those with cataracts at various stages, ranging from mild to mature, and those with a wide spectrum of measurement quality, from low to high.

Regarding the concern about the stages of cataracts studied, it is acknowledged that the density of cataracts can impact the quality of measurements, and denser cataracts have been shown to influence biometry results negatively.[2] However, it is important to emphasize that the primary focus of our study was not to investigate the impact of different cataract types or cataract densities on the quality of measurements. To better illustrate this point, for instance, denser cataracts are associated with poorer signal strength and measurement quality.[3] Yet, this condition is equal in our study's optical and ultrasonic measurements. However, in the 'Limitations' section, we openly acknowledged that our study did not categorize patients according to the type and degree of cataract. This transparency affirms our understanding of the potential confines of our findings and the areas that future research in this field could further explore.

In response to your comment regarding the influence of patient characteristics, lens opacities, ocular diseases, or ocular biometry history, on measurement reliability and agreement, we indeed took these factors into account. Firstly, we considered the confounding effects of age and gender in our study. As mentioned in the method section, these were included in the regression model and controlled for by treating them as covariates. Additionally, it is crucial to clarify that any patients with other ocular diseases or a history of ocular surgery were excluded from our study. This further ensures the specificity of our findings to the cataract surgery candidate population.

In response to the questions raised about the clinical implications of our study, we have clearly reported that the very strong correlation in axial length and anterior chamber depth measurements indicates that the more cost-effective US-4000 Echoscan could potentially serve as a feasible alternative to the pricier IOLMaster 700, especially in settings with limited resources. Nevertheless, the discrepancies noted in lens thickness measurements between the two biometry devices could considerably influence the planning of cataract surgeries. We thus recommend that clinicians should be careful when using these devices interchangeably, especially when dealing with measurements of low to moderate quality.

In response to the lack of interexaminer repeatability analysis comment, it is necessary to clarify that the term interexaminer analysis typically applies when multiple examiners are assessing the same subject using the same device to determine the consistency of measurements across different examiners. In the case of our study, two different devices were utilized to measure the biometric parameters of the same patients, but a separate examiner operated each device. This scenario does not lend itself to an interexaminer analysis because each examiner uses a different device, and any variability could be due to the devices themselves rather than differences in the examiners' evaluations.

In summary, we clarified that the primary focus of our study was to compare two biometry devices in different quality measurements, not to create a classification method for quality measurements. We acknowledged the potential impact of cataract types and density but noted that this wasn't the focus of our investigation. We affirmed that we accounted for confounding effects of age and gender and excluded patients with other ocular diseases or a history of ocular surgery. Finally, we explained that an interexaminer repeatability analysis was not applicable in our study design as a different examiner operated each device, hence, any

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