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Enhancing OCT Reliability: The Role of Eye-Tracking in Achieving Consistent Retinal Measurements [Response to Letter]

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Dear editor

We extend our appreciation for the interest in our study shown by Dr. Galvan et al and for the opportunity to respond to the letter.

In the letter, Dr. Galvan et al raise the potential bias of the absence of eye-tracking in our study.[1] The eye-tracking technique in OCT is employed to compensate for eye motion artifacts and to conduct point-to-point retina scanning for comparison. Both OCT devices of Cirrus HD-OCT 4000 and HD-OCT 5000 utilized in our study are equipped with the eye-tracking system, FastTrac™, to eliminate eye motion artifacts.[2,3] FastTrac™ is capable of tracking the retina and performing point-to-point scanning based on a reference image when using a single device. However, when using two devices, the information captured by one cannot be transferred to the other. We recognize that this may lead to potential bias. Nevertheless, we believe the regions scanned in our study are comparable for the following reasons.

Firstly, algorithms in the devices can identify the macular and the optic disc. Different from measuring retinal diseases, where it is necessary to locate the exact spot in the former scan and then capture an image for comparison, the macular and optic disc are anatomical landmarks. The fovea and optic disc can be identified by OCT algorithms, FoveaFinder™ and AutoCenter™, respectively.[3] To ensure that the analyzed regions are precisely aligned, we adopted the ONH cube 200×200 protocol and the macular cube 512×128 protocol for data collection in both devices, and the parameters are calculated automatically, as mentioned in the methodology section.[4] For example, the optic disc margin is defined as the termination of Bruch's membrane. As for the angle of entry into the pupil, despite variations, the measurement of a three-dimensional volume would be consistent.[5]

Secondly, Cirrus HD-OCT 4000 and HD-OCT 5000 share a same normative database. This implies that the scanning results of these two devices are designed to be compared with the same control data. Therefore, they should be comparable.

Furthermore, our work aims to test the reproducibility of the two machines, including the algorithms and protocols. The high intermachine reproducibility demonstrated in our study indirectly indicates that the ability of the algorithms to precisely identify these structures is satisfactory. When using two Cirrus OCT devices, a software called FORUM can be used to precisely match the image. Inducing FORUM in our future study might yield a more ideal result.

Herein, we conclude that our study provides valuable data regarding the reproducibility measurement and interocular parameters across different Cirrus OCT models while using eye-tracking technology together with the ONH cube 200×200 protocol and the macular cube 512×128 protocol. And the reproducibility and interocular symmetry of OCT parameters between the SD-OCT 4000 and 5000 devices are high. GCIPL measurements showed strong consistency across both devices, which is in line with their minimal standard deviation, indicating stable measurements. The

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intermachine differences of parameters measured at the ONH are significantly high, highlighting the necessity for cautious interpretation when comparing data from different OCT models. Combined with the use of FORUM software in future studies, could further enhance the reliability and clinical applicability of OCT measurements.

Disclosure

The authors report no conflicts of interest in this communication.

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