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Mesopic pupillometry in pre-LASIK patients by a placido-disc topographer and hartmann-shack aberrometer (Article)

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Abstract

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Introduction: Precise pupillometry is crucial to determine ablation optical zone (OZ) size selection in LASIK. Significant difference in the selection induces unwanted postoperative night visual disturbance. Placido-disc topographer and Hartmann-Shack aberrometer are commonly used in LASIK preoperative assessment. However, little is known on the precision and agreement of these devices in pupillometry. Hence, this study aimed to evaluate the precision (repeatability and reproducibility) and inter-device agreement of a Placido-disc topographer and Hartmann-Shack aberrometer in measuring mesopic pupil size in pre-LASIK patients. **Methods:** Mesopic pupillometry on 38 pre-LASIK patients were performed using both devices by two masked operators, on two separate sessions. Intra-session repeatability, inter-operator reproducibility and inter-device agreement were analysed. A disagreement value of ± 0.5 mm and 95% limits of agreement (LoA) were determined. **Results:** Hartmann-Shack aberrometer demonstrated higher repeatability and reproducibility than Placido-disc topographer in mesopic pupillometry. Ninety-seven percent and all of Hartmann-Shack wavefront aberrometer pupillometry were within ± 0.5 mm in repeated sessions and between the operators, respectively. The mesopic pupil size obtained from Placido-disc topographer was significantly larger than Hartmann-Shack aberrometer results ($P = 0.02$). The agreement between devices was low ($LoA > \pm 1$ mm) and only 53% of Placido-disc topographer pupillometry were within ± 0.5 mm of Hartmann-Shack aberrometer pupillometry. **Conclusion:** Hartmann-Shack aberrometer has higher precision within sessions and between operators, and it provides smaller mesopic pupillometry than Placido-disc topographer. Precise mesopic pupillometry could assist refractive surgeons in choosing a correct ablation OZ size during LASIK surgery to improve postoperative outcome. © 2021 UPM Press. All rights reserved.

Author keywords

Agreement Hartmann-Shack aberrometer Mesopic pupillometry Placido-disc topographer Precision

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