

AB026. Ocular rigidity is correlated with glaucomatous structural damage

Diane N. Sayah^{1,2}, Javier Mazzaferri¹,
Denise Descovich¹, Santiago Costantino^{1,2,3},
Mark R. Lesk^{1,2,3}

¹Maisonneuve-Rosemont Hospital Research Center, Montreal, QC, Canada; ²Department of Ophthalmology, Faculty of Medicine, Université de Montréal, Montreal, QC, Canada; ³Centre Universitaire d'ophtalmologie de l'Université de Montréal de l'Hôpital Maisonneuve-Rosemont, CIUSSS-E, Montreal, QC, Canada

Correspondence to: Mark R. Lesk, MD, FRCSC, MSc. Centre de recherche de l'Hôpital Maisonneuve-Rosemont, 5415 Boul. de l'Assomption, Montréal, QC H1T 2M4, Canada. Email: lesk@videotron.ca.

Background: The rigidity of the corneoscleral shell is an important biomechanical property which could be relevant in the pathophysiology of open-angle glaucoma (OAG). This study aims to evaluate the relationship between ocular rigidity (OR) and glaucomatous damage as represented by structural optical coherence tomography (OCT)-based parameters such as retinal nerve fiber layer (RNFL) and ganglion cell layer+inner plexiform layer (GCL + IPL) thicknesses. These parameters characterize the retinal layers that contain neuronal structures that form the optic nerve.

Methods: Sixty-six subjects (37 with early OAG, 11 with moderate to advanced OAG, 16 healthy) were recruited

in this study. OR measurements were carried out using a non-invasive clinical method developed by our group. As described in Beaton *et al.* (2015), this method, which is based on Friedenwald's equation, involves video-rate OCT imaging and automated choroidal segmentation, as well as dynamic contour tonometry to calculate the OR coefficient. RNFL and macular GCL thicknesses were acquired using the Cirrus SD-OCT (Carl-Zeiss Meditec, Dublin, CA, USA). Correlations between OR and structural parameters in all 66 eyes were assessed using SPSS.

Results: Significant correlations were found between OR and the average GCL+IPL thickness ($r=0.355$, $P=0.004$) as well as the minimum GCL + IPL thickness ($r=0.340$, $P=0.006$). Direct correlations were also found between OR and RNFL thickness in the inferior quadrant ($r=0.258$, $P=0.036$) and inferior clock hour ($r=0.313$, $P=0.011$).

Conclusions: In this study, we found a positive correlation between structural OCT-based parameters and OR, perhaps indicating more structural damage in less rigid eyes. These findings could provide insight into the pathophysiology of OAG. Further investigation is warranted to confirm the role of OR in glaucoma and elucidate whether there is a subgroup of patients for which OR plays a greater role.

Keywords: Ocular rigidity (OR); retinal nerve fiber layer (RNFL); ganglion cell complex; open-angle glaucoma (OAG)

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