The role of Optical coherence tomography (OCT) and Humphrey automated perimetry in the assessment of optic nerve damage in primary open angle glaucoma

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Aim: to compare two techniques used for assessment of optic nerve damage in glaucoma patients and to find whether these methods are complementary or can substitute each other.

Method: this is a prospective study conducted at king Hussein Medical Centre between April 2014 and July 2014. All patients diagnosed to have primary open angle glaucoma were enrolled in this study. Patients with unreliable automated perimetry and patients with past history of retinal or optic nerve diseases were excluded from the study. Optical coherence tomography and Humphrey automated perimetry will be performed to all patients on each visit. The data obtained was analyzed and compared.

Results: 250 patients (410 eyes) with glaucoma aged between 37 and 75 years. OCT was able to detect glaucomatous damage in 94.6% of glaucoma patients. It detected the damage in 93.6%, 96.1% and 97.6% of eyes with mild, moderate and severe cases respectively. The agreement between the two instruments was 91.9%, 94.2% and 97.6% in mild, moderate and severe cases respectively.

Conclusion: OCT proved to have a very good agreement with Humphrey automated perimetry and it can be used instead of HAP for assessment the wellness of optic nerve fibers especially when there is any limitation in interpretation of HAP images.
4. Discussion

Glaucoma is defined as characteristic optic disc damage and subsequent visual field loss usually caused by elevated intraocular pressure (IOP). This damage is caused by progressive loss of retinal ganglion cells and their fibers. Glaucoma is considered as a silent disease because it is usually a symptomatic until advanced damage takes place. Therefore, early detection of the disease is essential to prevent irreversible deterioration of vision. Optical coherence tomography (OCT) and Humphrey automated perimetry (HAP) are the most common techniques used to assess the wellness of optic nerve fibers. Evaluation of the optic nerve fibers is essential not only for the diagnosis of the disease and assessing its severity, it provides an evaluation regarding the progression of the disease and effectiveness of treatment as well. OCT works in a similar way to ultrasound, using near-infrared light instead of sound waves to produce high resolution, cross-sectional images. While HAP presents light stimuli in a random fashion and the patient have to record receiving that stimulus, therefore patient’s cooperativeness is essential to achieve optimum evaluation of the disease. The aim of this study is to compare those two methods to find whether those methods are complementary or can substitute each other for assessment of optic nerve wellness.

5. Conclusion

OCT proved to have a very good agreement with Humphrey automated perimetry and it can be used instead of HAP for assessment the wellness of optic nerve fibers especially when there is any limitation in interpretation of HAP images.

6. Reference

