Extended Abstract
Volume 4:2, 2020

Research and Reports in Medical Sciences

Open Access

Ophthalmology 2018: Comparison of peripapillary choroidal thickness between healthy subjects and patients with Parkinsons disease

Jose Manuel Larrosa

Miguel Servet University Hospital, Spain

Abstract

Purpose:
To study peripapillary choroidal thickness (PPCT) in healthy subjects using swept-source optical coherence tomography (SS-OCT), and to evaluate PPCT differences between Parkinson´s disease (PD) patients, and age- and sex-matched healthy controls.

Introduction:
Parkinsons disease (PD) is a neurodegenerative process that leads to the selective loss of dopaminergic neurons, mainly in the basal ganglia of the brain. Clinical manifestations were include movement alterations as well as non-motor symptoms, such as dementia, depression, and autonomic dysfunction. Neurons and neural circuits are outside the basal ganglia can be affected simultaneously or upstream of the substantia nigra.

Vision is one of the non-motor systems which was altered in PD, especially the visual field was corresponding to fovea. Recent studies were demonstrated the retinal thinning in different macular sectors and retinal nerve fibre layers in PD patients compared with healthy subjects, and alterations in multifocal electroretino-grams.

Several mechanisms have been proposed to be axonal loss in PD disease, leading to the tissue degeneration and ultrastructural changes of the retinal ganglion cells, but the changes of the choroidal layer have not been thoroughly evaluated. Mechanobiologic response of tissues and cells depends on the mode of deformation, and the magnitude and temporal profile of the stimulus, as well as the type of tissue or cell and its biologic state. Understanding the particular deformations observed in each tissue and ocular layer in patients with PD might facilitate diagnosis and treatment.

The main advantage of the present study was PPCT evaluated in a wide area of the parapapillary choroid using an automatic and the accurate new method.

Material and Methods:
Study population and design
This is a prospective, observational, cross-sectional case-control study. The study included the patients with definite PD, and age- and sex-matched healthy control's. Based on our preliminary studies, we calculated the necessary sample size to detect differences in choroidal thickness of atleast 20 µm as measured by the OCT, applying a two-tailed test with an alpha of 5% and a beta of 10%, and a risk ratio of 0.5. Based on this calculation, at least 70 eyes were needed. A total of 40 eyes of 40 PD patients and 80 eyes of 80 healthy controls were evaluated. PD diagnosis was based on the UK Brain Bank Criteria, which included, in the first stage, bradykinesia and one additional symptom, i.e., rigidity, 4–6 Hz resting tremor, or postural instability. Patients with a visual acuity less than 0.1, intraocular pressure (IOP) >20 mmHg, optic neuritis antecedent, no transparent ocular media and systemic disease that could affect the eye were excluded from the study. Subject's with refractive errors greater than 5 dioptres (D) of spherical equivalent refraction or 3D of astigmatism were also excluded from the study
.
Standard protocol approvals, registrations, and patient consent:
The study procedures were performed in accordance with the tenets of the Declaration of Helsinki, and the study protocol was reviewed and approved by the Aragon Ethics Committee For Clinical Research before the study began. Written informed consent to participate in the study was obtained from all the subjects.

Main outcome measures:
All the subjects underwent a complete neuro-ophthalmic examination, including assessment of best-corrected visual acuity using the Snellen chart, pupillary reflexes, and ocular motility; examination of the anterior segment, IOP with the Goldmann applanation tonometer, and papillary morphology by funduscopic exam; as well as the OCT. In the PD group, disease severity was assessed using the Unified Parkinson Disease Rating (UPDRS) and the Hoehn and Yahr scales, and disease duration, since the PD diagnosis were recorded. The Hoehn and Yahr scale is a commonly used diagnostic tool for quantifying the progression of PD symptoms. Stages range from 0 (no signs of disease) to 5 (requiring a wheelchair, or bedridden unless assisted). Clinician's and researchers most commonly use the UPDRS, and the motor section in particular, to follow the longitudinal course of PD in clinical studies.

OCT:
An optic disc 6.0×6.0 mm three-dimensional scan was obtained using the DRI OCT. This scan will combine's morphometric optic disc parameters and various parapapillary parameters, including RNFL and choroidal thickness. The subjects were seated and properly positioned. All DRI-OCT

images were obtained by a single well-trained technician blinded to the presence or absence of PD. The DRI-OCT Triton includes the new SMART Track tool that enhances the tracking, corrects for motion, and guides the operator to reduce potential errors while acquiring image's. Only eyes with good quality scans were included in this analysis. Good-quality SS-OCT images were defined with those with a signal strength, and without motion artifact, involuntary saccade, or overt misalignment of decentration. A total of three eyes were excluded due to poor DRI-OCT image quality. These eyes were substituted with two new patients in the PD group and one new healthy subject in the control group. The same investigator performed all of the OCT scan's and checked the accuracy of segmentation in each scan and the lack of artifacts. A total of 15 scan's in the PD group and 10 in the control group were excluded and repeated again. A 26×26 cube-grid will centred on the optic disc was generated automatically measure choroidal thickness. This grid was comprised 676 cubes around the optic nerve head with the 88 central cubes and corresponding to the optic nerve head area not analyzed; therefore the DRI-OCT Triton displays choroidal thickness for a total of 588 parapapillary cubes.

Results:

PPCT was significantly thicker in PD patients compared with controls in all four concentric zones evaluated (p0.0001). PPCT was followed a similar pattern in the control's and PD; it was thicker in temporal superior region, followed by superior, temporal, nasal, and inferior regions.

Conclusion:

PD Patients were presented with an increased PPCT in all the zones surrounding the optic disc compared with healthy subjects. The peripapillary choroidal tissue showed an concentric pattern, with the thickness increasing with increasing the distance from the optic nerve. SS-OCT could be useful for evaluating the choroidal thinning in clinical practice.

This work is partly presented at 17th International Conference on Clinical and Experimental Ophthalmology October 01-03, 2018