The OCT Staging System: A new method for a standardized classification of the glaucomatos retinal nerve fiber layer loss assessed with OCT.

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Purpose: To introduce a new standardized and easy-to-use method (the “OCT Staging System”) for classifying glaucomatos retinal nerve fiber layer (RNFL) damage assessed with spectral-domain Optical Coherence Tomography (sd-OCT).

Methods: The OCT Staging System was created based on 382 tests performed with the Nidek RS 3000 sd-OCT (Disc Map Protocol) in 98 healthy controls and 284 patients affected by either ocular hypertension or chronic open-angle glaucoma. This system uses the superior and inferior quadrant RNFL thickness values, corrected for age, plotted on an x-y diagram (Figs. 1 and 2). The normative data provided by the sd-OCT Nidek RS-3000 were used to plot both the curvilinear lines that divide the normal results from borderline stage, and the borderline results from statistically abnormal data, respectively. In order to classify RNFL defects into different stages, an arbitrary subdivision, based on optic disc examination, was utilized. The differences amongst various OCT instruments were also taken into account, modifying the x and y scales accordingly the instrument used. Sensitivity and specificity of the OCT Staging System were assessed in a different cohort including 64 patients with early OAG, and 62 normal subjects.

Results: The diagram classifies RNFL defects into 6 stages of increasing severity, and 3 groups, according to defect localization (superior, inferior or diffuse defect). A non-linear equation and two regression lines describe the lines which separate the different sectors of the diagram (Fig.2). These mathematical formulas have been used to create a software, which provides a quick classification of the OCT RNFL damage (Figs.3 and 4). Sensitivity and specificity of the OCT Staging System in discriminating between healthy and glaucomatos eyes were 95.2%, and 85.7%, respectively, considering borderline results as abnormal.

Conclusions: The OCT Staging System appears to provide a standardized and objective classification of glaucomatos RNFL damage. It can be used in day-to-day clinical practice for an easy and fast interpretation of RNFL measurements obtained with OCT. It can be used for classifying OCT data from different devices, yet still maintaining the same reliability and accuracy.

REFERENCES