



RNFL measurement with SD OCT can contribute to glaucoma diagnosis, but only if prior clinical examination has yielded a relevant level of glaucoma suspicion

The Science behind the Tip

It is well known that SD OCT can discriminate with reasonable accuracy between healthy volunteers and glaucoma patients with visual field defects. However, despite advantages for follow-up, SD OCT is not required for diagnosis in such patients. Diagnostic support by SD OCT is typically requested in patients with suspect glaucoma but normal visual field.

Recently several studies have explored the diagnostic ability of SD OCT in preperimetric glaucoma. The sensitivities of RNFL measurement were between 38% and 87% at specificities between 89% and 95%^{1,2,3}. For the clinician the important question is: what is the grade of diagnostic certainty given a pathologic test. To answer this question two points are deciding: 1st the positive likelihood ratio (+LR) given by the formula: $+LR = \text{sensitivity} / (100 - \text{specificity})$, and 2nd the prior probability of the disease (before performing the test). The glaucoma probability after the test is given by the prior probability multiplied with the +LR.

In preperimetric glaucoma the +LR of pathologic RNFL in SD OCT is between 7.6 and 9.2. Accordingly in a young subject without suspicion of glaucoma a pathologic SD OCT may negligibly increase the glaucoma probability from 1:500 to 9:500 (2%). Conversely in a subject with high glaucoma suspicion a pathologic OCT may increase the glaucoma probability from 1:1 to 9:1 (90%) which may contribute to the diagnosis preperimetric glaucoma.

References

- 1) Kim MJ, Jeoung JW, Park KH, Choi YJ, Kim DM. Topographic profiles of retinal nerve fiber layer defects affect the diagnostic performance of macular scans in preperimetric glaucoma. *Invest Ophthalmol Vis Sci*, 2014; 55:2079-2087.
- 2) Sung MS, Yoon JH, Park SW. Diagnostic validity of macular ganglion cell-inner plexiform layer thickness deviation map algorithm using cirrus HD-OCT in preperimetric and early glaucoma. *J Glaucoma*, 2014; 23:e144-e151
- 3) Begum VU, Addepalli UK, Yadav RK, Shankar K, Senthil S, Garudadri CS, Rao HL. Ganglion cell-inner plexiform layer thickness of high definition optical coherence tomography in perimetric and preperimetric glaucoma. *Invest Ophthalmol Vis Sci*, 2014; 55:4768-4775.