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Co-Relation between the peripapillary microvasculature and ocular pulse amplitude in glaucomatous optic neuropathy

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Introduction: Although elevated intraocular pressure (IOP) is the main risk factor for glaucoma, other risk factors and in particular vascular risk factors have been implicated in the pathogenesis of glaucoma. Impaired microcirculation in the Optic Nerve Head may contribute to the initiation and progression of glaucomatous neuropathy. It has been proposed that the main pathologic changes in glaucoma are located in the deep vascular areas in Optic Nerve Head region.

Objective: To find out the co-relation between ONH microvasculature perfusion and ocular pulse amplitude and their effect on Retinal Nerve fiber Layer Thickness in glaucomatous optic neuropathy.

Procedure: Study was conducted with 1000 subjects aged 30-50 ,who were diagnosed as glaucomatous optic neuropathy (based on the Hodapp-Parrish-Anderson criteria) and grouped as Normal Tension Glaucoma, Primary open angle glaucoma and non-glaucomatous. In every subject Peripapillary Vascular

Perfusion (PVP), Ocular pulse amplitude (OPA) and Retinal nerve fiber layer thickness(RNFL) was measured.

Results: In every group, glaucomatous stages and glaucoma suspects showed significantly lower blood perfusion index compared with normal eyes ($P \leq 0.0015$). Blood perfusion showed a direct correlation with Ocular perfusion pressure calculated with OPA ($P \leq 0.0123$). Similar discrimination capability PVP compared with RNFL thickness was found in both disease groups.

Conclusion: Impaired blood supply to the Optic Nerve head peripapillary area, may cause to develop RNFL thinning which directly leads to glaucomatous optic neuropathy. Investigations on PVP and OPA will provide a very early diagnosis and a repeatable follow up baseline for the disease, beyond the existing methods.

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