

# Pre-perimetric glaucoma is not perimetry-free glaucoma

**Abbreviations:** PPG, pre-perimetric glaucoma; GON, glaucomatous optic neuropathy; VF, visual field; SAP, standard automated perimetry; RGC, retinal ganglion cell; ONH, optic nerve head; RNFL, retinal nerve fibre Layer; OHT, ocular hypertension; OCT, optical coherence tomography

## Editorial

Glaucoma is an irreversible, multifactorial, degenerative and progressive optic neuropathy characterized by the loss of retinal ganglion cells (RGCs) and their axons leading to thinning of the retinal nerve fiber layer (RNFL) and the loss of visual field (VF). Glaucoma is the second leading cause of preventable blindness over the world. Glaucomatous optic neuropathy (GON) usually firstly occurs in optic nerve head (ONH) before detectable VF defects. It has been well-known that glaucomatous VF defects might be detected in perimetry when 30-50% of RGCs was lost.<sup>1-6</sup> The structural damages of the RNFL and optic disc precede VF loss detected by standard automated perimetry (SAP) in many eyes with early GON. A reduction in the thickness of the RNFL is an early sign of pre-perimetric glaucoma (PPG).<sup>1-6</sup> Pre-perimetric glaucoma is defined as the presence of the signs of characteristic GON and the damage of RNFL before the development of VF defects. Hence, the conventional achromatic SAP can not reveal any VF defect in the cases with PPG.<sup>3-7</sup>

It has been demonstrated that 55% of patients of ocular hypertension (OHT) converted to those of treatment group based on optic disc changes without field changes. This means that almost a half of OHT cases will convert to PPG. Additionally, it has been also showed that, in almost 60% of OHT, RNFL defects were observed in approximately 6 years before VF loss in SAP was developed.<sup>6,7</sup> It is also known that PPG is an early stage of primary open-angle glaucoma or early stage glaucoma. In numerous studies, it has been demonstrated that in the quantitative and objective evaluation of the GON and the assessment RNFL loss for the early detection of patients with PPG, scanning laser polarimetry (GDx-VCC) and optical coherence tomography (OCT) provided accurate and reproducible data.<sup>8-14</sup> In last years, it has been reported that OCT-angiography is a reliable, easy-to-perform method for the diagnosis of PPG.<sup>15,16</sup> The correct evaluation of ONH and peripapillary and macular RNFL using ophthalmoscopy and OCT is still essential for PPG diagnosis. However, to diagnose PPG, perimetry is also essential. PPG is the glaucoma with normal perimetry or normal-perimetric glaucoma. In the other words, PPG is not perimetry-free glaucoma.

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## Conflicts of interest

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