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# Analysis of the Influence of Type of Diabetes Mellitus on the Development and Type of Glaucoma

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Dear Editor,

We read with interest the article by Halilovic et al. regarding the influence of diabetes mellitus (DM) type on the glaucoma development (1). Similar to the results of previous studies, the authors found that the individuals with DM have an increased risk of developing primary open-angle glaucoma (POAG) (2) and neovascular glaucoma (NVG) (3).

Glaucoma is a type of optic neuropathy and DM alone could cause optic neuropathy (by accelerated apoptosis of ganglion and retinal inner neurons, altered metabolism of astrocytes and compromised neuro-glial function) with a complex relation between the two of them (2, 3). Longer DM duration is associated with the increased risk of having POAG (2), while use of systemic medications such as statins, systemic  $\beta$ -blockers and nitrates is associated with lower intraocular pressure (IOP) (3). On the other hand, DM is the major etiologic factor for NVG, with majority of cases seen in proliferative diabetic retinopathy (PDR) (3). Poor metabolic control is a good marker for development and progression of diabetic retinopathy (DR), referring to duration and control of DM which is related to hyperglycemia, hypertension, hyperlipidemia, pregnancy, nephropathy and anemia (3, 4). It is important to note that the DM patients have increased risk of cataracts that can significantly influence the visual acuity (VA) too (4, 5).

Other risk factors that predict the development of POAG include: family history, older age, male gender, higher intraocular pressure, longer axial length, thinner central cornea, higher waist to hip ratio, higher cup-to-disk ratios of the optic disc, and higher pattern standard deviation values on the Humphrey automated perimeter at baseline examination (6). It should be noted that central corneal thickness is found to be thicker in patients with DM, which could also cause higher IOP readings (3, 6).

For these reasons, we would kindly ask the authors to perform the correlations for age, gender, BMI, DM duration and regimen of therapy, HbA<sub>1c</sub>, patient follow up time, the use of other systemic drugs, VA, family history of POAG, IOP changes and type of therapy, presence and grade of the lens opacification, axial

length, stage of DR, cup-disc ratio and deviation values on the automated perimeter between the groups. Without these information's it would be difficult to hypothesize the direct influence of DM on glaucoma development, especially in patients without PDR. In these patients, glaucoma development could be consequent to summation of more risk factors, including poor metabolic control, rather than DM type. These findings will significantly contribute to the papers scientific value and contribution.

Overall we agree with Halilovic et al. that DM remains important risk factor for glaucoma development and all diabetic patients should have regular ophthalmological control examinations. Other systemic and ocular risk factors such as DM duration, glycemic control together with use of other systemic drugs, IOP values and DR progression should be carefully monitored too.

**CONFLICT OF INTEREST: NON DECLARED.**

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