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Primary open-angle glaucoma in patients of Middle Eastern descent

Primary open-angle glaucoma (POAG), a leading cause of blindness worldwide, is a heterogeneous disease that uniquely presents and progresses differently within genetically distinct populations. As the reduction of intraocular pressure (IOP), the only currently approved method of therapy, has failed to fully arrest the disease, it is important to increase awareness of population-specific risk factors and develop improved management plans. Although POAG has been extensively studied in Asian, European, and recently African descent populations, it remains poorly characterized in patients of Middle Eastern descent (MED).

Specifically, POAG has been shown to more disproportionately affect people of Asian and African descent compared to those of European descent. A key finding in Asian populations is the exceptionally high proportion of normal-tension glaucoma (NTG).[1] A recent review by Huck et al. highlighted that among POAG patients; African decent patients have larger cup-to-disc ratios (CDR), thinner corneas, a greater proportion of systemic vascular diseases, and possibly higher IOP levels when compared to European descent patients.[2] Our group recently demonstrated that reductions in retrobulbar and retinal capillary blood flow in African decent POAG patients are strongly correlated with glaucomatous structural changes in the optic nerve head and reduced macular thickness compared to their European decent counterparts.[3]

Together, these findings highlight the importance of investigating differences in POAG across different populations to provide improved approaches to disease management. We believe there is currently a significant lack of knowledge of such clinically relevant considerations in MED populations. A study evaluating IOP in Iran found a 3.2% prevalence of POAG, and among POAG patients 53% were high-tension and 47% were NTG.[4] The higher than expected percentage of NTG in this sample mirrors Asian POAG patients, and suggests that screening with IOP may be less effective in these populations. However, this study was limited to Iran and very few distinguishing studies have been performed in MED populations. Mousa et al. showed that total antioxidant status was significantly decreased and associated with worse POAG indices in Saudi Arabian patients.[5] A genetic review of POAG described that antioxidant glutathione S-transferase genotypes GSTT1 and GSTM1 are strongly associated with POAG across ethnicities, including MED patients.[6] In contrast, several loci do not appear to contribute to POAG in patients of MED as they do in other groups. Taken together, these potential genetic and pathophysiologic variations in MED patients suggest the possibility of subsequent clinical differences, and therefore warrant further exploration. Significant data is missing detailing the prevalence, incidence, and progression of POAG in MED populations, as well as a comparative understanding of specific clinical risk factors including CDR, corneal thickness, optic disc size, ocular blood flow, and co-morbidities.

Distinctive genetic and physiological mechanisms differ among population groups and contribute to diverse POAG risk factor profiles, prognosis, and responses to treatments. To date, there is a disparity of data and understanding of risk in MED POAG patients despite growing MED populations worldwide. Due to recent findings in POAG patients of African descent among others, and specific findings of high prevalence of NTG and low antioxidant status in MED POAG patients, we strongly encourage discussion and identification of specific POAG risk factors in MED populations.

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