

Is Genetic Risk for Sleep Apnea Causally Linked With Glaucoma Susceptibility?

Nathan Ingold (1,2) , Adrian I Campos (1,3) , Xikun Han (1,3) , Jue-Sheng Ong (1) , Puya Gharahkhani (1) , David A Mackey (4) , Miguel E Rentería (1,2,3) , Matthew H Law (1,2) , Stuart MacGregor (1)

1 Department of Genetics & Computational Biology, QIMR Berghofer Medical Research Institute, Brisbane, Queensland, Australia.

2 School of Biomedical Sciences, Faculty of Health, Queensland University of Technology, Brisbane, Queensland, Australia.

3 School of Biomedical Sciences, Faculty of Medicine, The University of Queensland, Brisbane, Queensland, Australia.

4 Centre for Ophthalmology and Visual Science, Lions Eye Institute, University of Western Australia, Nedlands, Western Australia, Australia.

PURPOSE: Observational studies have suggested that individuals with pre-existing sleep apnea (SA) have up to double the risk of developing glaucoma than individuals without SA. Understanding risk factors for glaucoma is important to assist with well-structured screening, early intervention, and efficient allocation of specialist consultation. The objective of this study is therefore to use genetic data to determine whether SA is a causal risk factor for glaucoma.

METHODS: Two-sample Mendelian randomization (MR) analyses were performed to assess the association between genetically predicted SA and glaucoma susceptibility using genome-wide association study (GWAS) of 25,062 SA cases, 313,372 controls derived from 23andMe and summary data from a glaucoma GWAS meta-analysis (20,582 cases, 119,318 controls) , including individuals of European descent, mainly from the UK Biobank.

RESULTS: Inverse variance weighted regression of genetic susceptibility for SA on risk of glaucoma revealed no strong evidence for an association between SA and glaucoma (OR = 0.95, 95% confidence intervals = 0.84-1.07) , results were consistent across all MR predictors.

CONCLUSIONS: We found little genetic evidence supporting a causal association between SA and glaucoma. Our results refute the possibility of a large effect (glaucoma OR > 1.5 per doubling of odds on SA) between SA and glaucoma.

Invest Ophthalmol Vis Sci. 2022 Jan 3;63(1) :25. doi: 10.1167/iovs.63.1.25.

PMID: 35050305 PMCID: PMC8787584 DOI: 10.1167/iovs.63.1.25