



Published in final edited form as:

Ophthalmology. 2017 May ; 124(5): e50–e51. doi:10.1016/j.ophtha.2016.10.034.

REPLY

Louis R. Pasquale, MD^{1,2}, Leslie Hyman, PhD³, Janey L. Wiggs, MD, PhD¹, Bernard A. Rosner, PhD^{2,4}, Kaumudi Joshipura, BDS, ScD^{5,6}, Mark Mcevoy, PhD⁷, Zachary E. Mcpherson, BMedSci⁷, John Danias, MD, PhD⁸, Jae H. Kang, ScD²

¹Glaucoma Service, Massachusetts Eye and Ear Infirmary and Harvard Medical School, Boston, Massachusetts

²Channing Division of Network Medicine, Department of Medicine, Brigham & Women's Hospital and Harvard Medical School, Boston, Massachusetts

³Division of Epidemiology, Department of Preventive Medicine, Stony Brook University, Stony Brook, New York

⁴Department of Biostatistics, Harvard T. H. Chan School of Public Health, Boston, Massachusetts

⁵Department of Epidemiology, Harvard T. H. Chan School of Public Health, Boston, Massachusetts

⁶Center for Clinical Research and Health Promotion, University of Puerto Rico-MSU, San Juan, Puerto Rico

⁷The School of Medicine and Public Health, University of Newcastle, Callaghan, Australia

⁸Glaucoma Service, Department of Ophthalmology, SUNY Downstate Medical Center, Brooklyn, New York

We thank Drs Agrawal and Agrawal for their interest in our study on oral health and primary open-angle glaucoma (POAG).¹ They asked about how the cases with primary angle closure glaucoma were excluded and whether gonioscopy was performed in all patients. For our study of participants all across the United States, it was cost prohibitive to conduct repeated standardized eye examinations on 40 536 men during the 26 years of follow-up; thus, we relied on standardized review of medical records and visual fields to confirm POAG cases. We used several approaches to identify glaucoma cases that may have had angle closure for exclusion. As stated in the Methods section, for 70% of POAG cases, we had documentation from medical records that gonioscopy confirmed open angles. In the remaining cases, we required documentation that 1 dilated eye examinations were performed without any adverse effects and checked that the patient received no laser peripheral iridotomy. Our requirement of 2 reliable visual fields that show reproducible loss ensured that dilated examination information was available. (The few participants who we identified as having angle closure glaucoma were excluded from further follow-up at diagnosis in the analyses of POAG incidence by oral health). It should be noted that angle closure glaucoma is relatively uncommon in the United States, with an annual incidence

estimate of 8.3 per 100 000.² Thus, given our methodology for case ascertainment and the relatively low incidence of angle closure glaucoma in the United States, it seems highly unlikely that any angle closure glaucoma cases were included in our 485 incident POAG cases.

A second question was related to diabetes, which was associated with oral health (as demonstrated in Table 1 in the original article) and with POAG, and how it was handled in our data analysis. In all our main results presented in Tables 2 through 5, we adjusted for type 2 diabetes status when evaluating the risk of POAG by oral health status; hence, the results presented can be interpreted as the associations with various oral health parameters that were independent from type 2 diabetes. When we conducted alternate analyses, where we did not statistically adjust for type 2 diabetes (relative risk, 1.45; 95% confidence interval, 1.07–1.97 for recent tooth loss), or when we excluded anyone with type 2 diabetes (relative risk, 1.44; 95% confidence interval, 1.04–2.00 for recent tooth loss), results were virtually unchanged compared with the main results (relative risk, 1.45; 95% confidence interval, 1.06–1.97 for recent tooth loss).¹ When both type 2 diabetes and oral health were included in models, recent tooth loss showed stronger adverse associations than diabetes, indicating that the relation between tooth loss and POAG may also likely be mediated by factors unrelated to type 2 diabetes.

We agree that our study points to a need for additional research to confirm our results and to further explore the role of type 2 diabetes and oral health on POAG risk as well as on POAG progression.

Acknowledgments

Financial Disclosures: The authors made the following disclosures: J.D.: Grant - Research to Prevent Blindness, National Eye Institute. L.P.: Grant - National Institutes of Health; Consultant - Novartis, Bausch & Lomb; Speaker - Allergan, Bausch & Lomb. J.W.: Grant - National Eye Institute

References

1. Pasquale LR, Hyman L, Wiggs JL, et al. Prospective study of oral health and risk of primary open-angle glaucoma in men: data from the Health Professionals Follow-up Study. *Ophthalmology*. 2016;123:2318–2327. [PubMed: 27554035]
2. Erie JC, Hodge DO, Gray DT. The incidence of primary angle-closure glaucoma in Olmsted County, Minnesota. *Arch Ophthalmol*. 1997;115:177–181. [PubMed: 9046251]