Commentary: Obstructive sleep apnea: A silent associate of diabetic retinopathy

Obstructive sleep apnea (OSA) is one of the important sleep disorders associated with various ophthalmic diseases, including floppy eyelid syndrome, ischemic optic neuropathy, papilledema, glaucoma, central serous chorioretinopathy (CSCR), retinal vein occlusion, nocturnal lagophthalmos, and diabetic retinopathy (DR).[1] DR is notable for its blinding potential and increasing prevalence. The association of OSA with increased risk and severity of DR is frequently being recognized in the recent literature.[1-3] The treatment modalities for OSA, like continuous positive airway pressure, have been shown to decrease the severity of proliferative diabetic retinopathy (PDR).[4] However, some studies show the association between OSA and DR to be insignificant.[5,6] This disagreement in findings between different studies could be explained by the confounding factors such as age, gender, body mass index, duration and control of diabetes, dyslipidemia, smoking, anemia, and presence of other comorbidities. The authors in the recent article titled "Screening for Obstructive Sleep Apnea in a Diabetic Retinopathy Clinic in a Tertiary-Care Center" studied the association of OSA and DR from India.[7] This article highlights some important aspects. First, the authors have adopted three models of the outcome variables for statistical purposes. Model 1 compared "no DR" with "any DR," Model 2 compared "less severe DR" (which included "no DR," and "mild nonproliferative DR [NPDR]") with "more severe DR" (which included "moderate NPDR," "severe NPDR," and "PDR"), and Model 3 compared "no diabetic macular edema (DME)" with "DME." This different subgroup analysis made the results more significant. Second, the authors have adjusted for confounders, and on multiple logistic regression, the patients with "moderate–severe OSA" had higher odds in developing any DR, more severe DR, and DME.

There are certain finer aspects where this current study would have done better. First, because this study was conducted in the retina clinic of a tertiary-care center and DR patients constitute the majority of the patients in the clinic, the number of "no DR" groups might be insufficient to be taken for comparison. Similarly, the number of patients with PDR was 245 (67.7%) and that with DME was 306 (84.5%). The increased proportion of these sight-threatening DR patients in comparison with the less severe DR patients was due to the presentation of the DR patients in an advanced stage to the tertiary referral eye center where the study was conducted. A future study involving a larger number of DM patients from the diabetic clinics or the community will make the "no DR" group and "less severe DR" group comparable with the DR group and severe DR groups, respectively. Second, 351 (97%) patients had type 2 DM, and 11 (3%) had type 1 DM. A separate study involving more type 1 DM patients may also have some interesting observations. Third, the long-term effects of treatment for OSA altering the severity of DR need to be studied. Because the recent study is a prospective one, the authors can extend the study to find the long-term effects of treatment for OSA on DR.

The study on the association of OSA and DR has many future perspectives. First, the statistical analysis of studies

associating OSA and DR plays a pivotal role. Both univariate analysis and analysis after binomial regression with adjustment should be done to find whether the association is significant or not. Second, the inclusion of OSA is a systemic risk factor in the work-up of patients with DR. In addition to hyperglycemia, other systemic factors such as hypertension, hyperlipidemia, nephropathy, cardiac ailments, and anemia are established contributors to the severity of DR. OSA is gradually getting included in the list of systemic factors associated with DR. However, large cohort studies, adjusting the confounding factors with long-term follow-up data are needed, before the work-up for sleep disorders, especially OSA, is made a routine of all DR patients. Otorhinolaryngologists should take a note of referring patients with moderate–severe OSA for a complete ophthalmological evaluation, especially to find out the presence and severity of DR, if the patient is diabetic.

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References

1. Santos M, Hofmann RJ. Ocular manifestations of obstructive sleep apnea. J Clin Sleep Med 2017;13:1345-8.
2. Zhu Z, Zhang F, Liu Y, Yang S, Li C, Niu Q, *et al*. Relationship of obstructive sleep apnoea with diabetic retinopathy: A meta-analysis. Biomed Res Int 2017;2017:4737064.
3. Chew M, Tan NY, Lamoureux E, Cheng CY, Wong TY, Sabanayagam C. The associations of objectively measured sleep duration and sleep disturbances with diabetic retinopathy. Diabetes Res Clin Pract 2020;159:107967.
4. Altaf QA, Dodson P, Ali A, Raymond NT, Wharton H, Fellows H, *et al*. Obstructive sleep apnea and retinopathy in patients with type 2 diabetes. A longitudinal study. Am J Respir Crit Care Med 2017;196:892-900.
5. Zhang R, Zhang P, Zhao F, Han X, Ji L. Association of diabetic microvascular complications and parameters of obstructive sleep apnea in patients with type 2 diabetes. Diabetes Technol Ther 2016;18:415-20.
6. Leong WB, Jadhakhan F, Taheri S, Chen YF, Adab P, Thomas GN. Effect of obstructive sleep apnoea on diabetic retinopathy and maculopathy: A systematic review and meta-analysis. Diabet Med 2016;33:158-68.
7. Kaswan R, Bansal R, Katoch D, Dogra M, Singh R, Gupta V, *et al*. Screening for obstructive sleep apnea in a diabetic retinopathy clinic in a tertiary care center. Indian J Ophthalmol 2021;69:3349-57.

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Quick Response Code:

Website: www.ijo.in

DOI: 10.4103/ijo.IJO_864_21

Cite this article as: Ramasamy K, Mishra C. Commentary: Obstructive sleep apnea: A silent associate of diabetic retinopathy. Indian J Ophthalmol 2021;69:3357-8.