The Risk of Diabetic Retinopathy in Diabetic Patients with Sleep Apnea

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Introduction: Sleep apnea (SA) causes metabolic dysregulation, and might predispose diabetic patients to develop diabetic retinopathy (DMRP). However, conflicting data about the association between SA and DMRP have been reported. By using Taiwan National Health Insurance (NHI) Research Database, we performed a nationwide population-based cohort study to determine the risk of DMRP in diabetic patients with SA.

Methods: We selected adult DM patients from the Longitudinal Health Insurance Database 2010, which contained a million people randomly sampled from all beneficiaries enrolled in the NHI system in 2010. Adult patients with SA diagnosis before DM and remaining with SA diagnosis after polysomnography were selected for the SA group. Each SA patient was matched to 4 randomly-selected control subjects by propensity score. The cumulative incidence of DMRP was assessed with Kaplan-Meier method and log-rank test. Poisson regression and Cox regression analyses were performed to assess the effect of SA on incident DMRP.

Results: A total of 325 SA patients and 1300 control subjects was identified, and 8 (2.46%) and 32 (2.46%) patients developed DMRP, respectively (p>0.99). SA patients had a similar cumulative incidence of DMRP as the control subjects (p=0.82). SA patients had a significant higher incidence rate of IPF than the control subjects (incidence rate ratio [95% CI]: 0.91 [0.61-1.36], p=0.6416). Cox regression analysis showed that SA was not an independent risk factor for DMRP (HR [95% CI]: 0.91 [0.42-1.98], p=0.8176).

Conclusion: This study showed that SA did not contribute to the progression to DMRP in diabetic patients. Our results might be limited by the heterogenicity of our patient population, including patients with various severity of SA. Previous studies showing the effects of SA on increasing risk of DMRP or diabetic macular edema mainly included patients with severer SA. Further large-scale prospective studies are warranted to investigate the effect of SA and SA-specific treatment on the risk of DMRP in diabetic patients.

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