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ADMINISTRATIVE INFORMATION

Support - 1 National High Level Hospital Clinical Research Funding; 2 Elite Medical Professionals project of China-Japan Friendship Hospital (NO.ZRJY2021-QM24).

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2024120043

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 12 December 2024 and was last updated on 15 December 2024.

INTRODUCTION

Review question / Objective To analyze the retina and choroid changes of obstructive sleep apnoea by optical coherence tomography (OCT) or optical coherence tomography angiography (OCTA):
(1) the average thickness of peripapillary retinal nerve fiber layer (pRNFL), ganglion cell complex (GCC), central macular or choroid;
(2) The vessel density of the radial peripapillary capillaries (RPC),the superficial capillary plexus (SCP),the deep capillary plexus (DCP), or the choriocapillaris (CC).

Condition being studied Obstructive sleep apnea (OSA) is a common disease characterized by recurrent apnea or hypopnea, resulting in hypoxemia and hypercapnia in the body, leading to secondary sympathetic activation, oxidative stress and systemic inflammation. Studies have shown

that OSA is associated with an increased risk of several ocular vascular diseases, including non-arteriotoxic anterior ischemic optic neuropathy, glaucoma, and diabetic retinopathy, etc. Given the critical role of OSA in ocular perfusion, we aimed to assess retinal and choroid thickness and vascular density in OSA patients.

METHODS

Participant or population Patients diagnosed with OSA as the observation group and healthy people as the control.

Intervention This is a review of assessment of the retina, choroid and microvascular changes in patients with obstructive sleep apnea by OCT or OCTA.

Comparator Patients with OSA as the observation group and healthy people as the control. And they

were both assessed by optical coherence tomography (OCT) or optical coherence tomography angiography (OCTA).

Study designs to be included The study designs include case control study, cross-sectional study and cohort study.

Eligibility criteria The inclusion criteria are as follows: (1) they are original articles; (2) they are studies comparing patients with obstructive sleep apnea and healthy controls; (3) OCT data were provided as mean \pm standard deviation (SD).

Information sources The PubMed, Embase and Cochrane Library databases were searched from inception to 30 November 2024 for studies evaluating retinal and choroidal changes between obstructive sleep apnea patients and healthy controls using optical coherence tomography (OCT) or optical coherence tomography angiography (OCTA).

Main outcome(s)

- 1.The average thickness of peripapillary retinal nerve fiber layer (pRNFL), ganglion cell complex (GCC), central macular and choroid
- 2.The vessel density of the radial peripapillary capillaries (RPC),the superficial capillary plexus (SCP),the deep capillary plexus (DCP), or the choriocapillaris (CC).

Quality assessment / Risk of bias analysis The Newcastle-Ottawa Scale will be used to assess the quality of individual studies by two independent..

Strategy of data synthesis The Stata Software is used for analysis. Mean differences (MDs) and its 95% confidence interval (CI) are calculated for continuous estimates. Heterogeneity among studies are performed using the χ^2 statistic test and I^2 statistic test. A fixed-effect model is employed when no significant heterogeneity existed among studies; otherwise, the random-effect model is used. Funnel plot asymmetry was further assessed using Egger's linear regression test about the meta analysis which is above five researchs.

Subgroup analysis All the meta-analyses will be performed in subgroups by ethnicity or device if possible.

Sensitivity analysis The reliability of the outcomes of this study was confirmed through a sensitivity analysis of the outcome indications, with each study being removed one by one.

Country(ies) involved China.

Keywords Sleep Apnea, Obstructive;OCT; retina;choroid.

Contributions of each author

Author 1 - Mengyu Han - Author 1 drafted the manuscript.

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Author 2 - Tong Zhao - The author provided statistical expertise.

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Author 3 - You Chen - The author contributed to the development of the selection criteria, and the risk of bias assessment strategy.

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Author 4 - Yi Chen - The author read, provided feedback and approved the final manuscript.

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