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The effect of continuous positive airway pressure treatment on the reduction of gestational complications in pregnant women with obstructive sleep apnea

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ADMINISTRATIVE INFORMATION

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 04 March 2024 and was last updated on 04 March 2024.

INTRODUCTION

Review question / Objective To investigate the effect of CPAP treatment in reducing adverse hypertensive outcomes in pregnant women with OSA.

Condition being studied Pregnancy can contribute to the development or exacerbation of obstructive sleep apnea (OSA) and increase the risk of gestational complications. Continuous positive airway pressure (CPAP) is the first-line and gold-standard treatment for OSA and is regarded as the most feasible choice during pregnancy. However, the effectiveness of CPAP therapy in pregnant women with OSA remains inconclusive.

METHODS

Search strategy We conducted a systematic search through PubMed, EMBASE, and Cochrane Database of Systematic Reviews and Clinical Trials without language restrictions (all searched from inception to November 5th, 2023). Briefly, the following search terms were used: ((OSA or OSAS or OSAHS or SDB or SRBD or OSDB or SAHS) OR “snoring” OR “sleep disordered breathing” OR “sleep apnea”) AND (“gestation*” OR “gestational hypertension” OR “pre-eclampsia” OR “eclampsia”) AND ("pregnancy“). References of relevant articles were also searched for potentially eligible studies. After removing duplicates, titles and abstracts were independently reviewed by two authors (YC Chang and YC Lee) of each study and further reviewed the full texts to select eligible studies. The discrepancy was resolved by discussion between the two authors to achieve consensus.

Participant or population (1) Pregnancy women with OSA confirmed by polysomnography or home sleep test (2) Treatment with continuous positive airway pressure (3) Clearly defined experimental

and control groups. (4) Outcomes measurements included risk of composite hypertensive outcomes (e.g. gestational hypertension or pre-eclampsia).

Intervention Continuous positive airway pressure (CPAP).

Comparator No treatment.

Study designs to be included Orignial studies.

Eligibility criteria Inclusion criteria(1) Pregnancy women with OSA confirmed by polysomnography or home sleep test (2) Treatment with continuous positive airway pressure (3) Clearly defined experimental and control groups. (4) Outcomes measurements included risk of composite hypertensive outcomes (e.g. gestational hypertension or pre-eclampsia). Exclusion criteria (1) Study did not contain the risk of hypertensive outcomes. (2) Patients received treatment other than continuous positive airway pressure. (3) The study was classified as article review, protocol, letter, poster, conference summary, case report or editorial.

Information sources We conducted a systematic search through PubMed, EMBASE, and Cochrane Database of Systematic Reviews and Clinical Trials without language restrictions (all searched from inception to November 5th, 2023).

Main outcome(s) The primary outcome was the risk ratio of gestational hypertension and preeclampsia between pregnant women with OSA receiving CPAP treatment and those without.

Quality assessment / Risk of bias analysis The risk of bias and quality assessment was conducted by the aforementioned two authors using the Cochrane risk of bias tool for randomized trials (version 2, RoB 2, London, United Kingdom)[24] for randomized trials and the Newcastle-Ottawa Scale (Wells et al., 2000) for prospective cohort studies.

Strategy of data synthesis All statistical analyses and plotting were conducted using RStudio version RStudio 2022.07.2 (RStudio, Inc., Boston, MA, USA) with “meta” and “metabin” package. The random-effects model was employed because the outcomes could vary between studies. Since the outcome measurements were incidence risk, the risk ratio (RR) and 95% confidence intervals (CIs) were used in the forest plots.

Subgroup analysis Subgroup analysis was also conducted to evaluate the heterogeneity.

Sensitivity analysis Sensitivity analysis was performed by omitting each study to evaluate the stability of results.

Language restriction No language restriction.

Country(ies) involved Taiwan.

Keywords pregnancy, obstructive sleep apnea, gestational hypertension, preeclampsia.

Contributions of each author

Author 1 - Yi-Chieh Lee - Author 1 drafted the manuscript and did the statistic analysis.
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