

Childhood OSA is an Independent Determinant of Blood Pressure in Adulthood – A Longitudinal Follow-up Study

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Background: Childhood obstructive sleep apnoea (OSA) is important as it can lead to a variety of complications. Published studies have demonstrated cross-sectional association between OSA in children with elevated blood pressure (BP). However, longer term cardiovascular outcomes associated with childhood OSA remain unexplored.

Objective: To evaluate the associations of childhood OSA with adult ambulatory BP parameters in a prospective 10-year follow-up study.

Methods: Participants were recruited from a cohort established for our previous epidemiological study, which examined the prevalence of OSA in ethnic Chinese children aged 6-13 years. They were invited to undergo clinical examination, overnight polysomnography and 24-hour ambulatory BP monitoring. Multivariable log-binomial regression was used with inverse probability weighting to assess the adjusted associations of childhood OSA with risks of hypertension and non-dipping of nocturnal BP in adulthood.

Results: 243 participants (59% male) completed the follow-up visit. The mean age was 9.8 (\pm SD1.8) years at baseline and 20.2 (\pm SD1.9) years at follow-up, with a mean follow-up duration of 10.4 (\pm SD1.1) years. Childhood moderate-to-severe OSA was associated with higher nocturnal systolic blood pressure (SBP) (difference in BP using normal participants as reference: 6.5mmHg; 95% confidence intervals (CI): 2.9, 10.1) and reduced nocturnal SBP dipping at follow-up (-4.1%; 95% CI - 6.3, -1.8) , adjusted for age, gender, body mass index and height at baseline, regardless of OSA status in adulthood. Results remained the same even after additional adjustment for BMI, obstructive apnoea hypopnoea index and oxygen desaturation index at follow-up. Moderate-to-severe OSA in childhood, compared to no OSA, was also associated with higher risks of non-dipping in nocturnal SBP (Relative risk (RR) 1.3; 95% CI: 1.0, 1.7) and mean arterial pressure (RR 1.8; 95% CI: 1.3, 2.4) in early adulthood.

Conclusion: Childhood OSA was found to be an independent risk factor for adverse BP outcomes in adulthood.