Association between childhood primary snoring and cardiovascular health

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KEY MESSAGES

1. Although persistent primary snoring (PS) over an average of 5 years was associated with reduced endothelial function compared with controls, neither incidence nor resolution of PS was associated with significant changes in endothelial function.
2. These findings suggest no causal relationship between PS and increased cardiovascular risk in children.
3. Participants with incident obstructive sleep apnoea (OSA) had a higher ambulatory blood pressure than those without OSA. This suggests that OSA may increase the cardiovascular risk of children.

Hong Kong Med J 2018;24(Suppl 3):S39-40
HMRF project number: 01120736

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Introduction

Primary snoring (PS) is defined as habitual snoring but with no more than one respiratory event per hour during sleep, on the basis of overnight polysomnography. It is the mildest form of sleep-disordered breathing and is considered a benign condition that results in no complications and hence can be left untreated.[1] Nonetheless, studies have reported that PS in children is associated with adverse health outcomes including behavioural problems,[2] metabolic impairment,[3] and cardiovascular complications.[4] A previous study revealed that childhood PS is independently associated with poorer endothelial function.[4] Nonetheless, these cross-sectional studies could not provide any evidence of a causal relationship. Childhood PS may progress or resolve with growth.[5] Studies of a longitudinal association between PS and health outcomes are necessary to provide evidence of a causal relationship. If cardiovascular complications are found to worsen in children with persistent PS, a change in the current PS management paradigm may be needed.

Methods

We prospectively followed up two cohorts of children (one with PS and one without PS) to investigate the longitudinal association between PS and cardiovascular outcomes—namely, endothelial function and ambulatory blood pressure. We hypothesised that persistent PS in children was associated with reduced endothelial function and elevated ambulatory blood pressure, compared with non-snoring controls. All participants underwent overnight polysomnography and measurement of flow-mediated dilation (FMD) of the brachial artery (a measure of endothelial function) at baseline and at follow-up after a mean interval of 5 years. At the follow-up visit, 24-hour ambulatory blood pressure monitoring was also performed.

Results and Discussion

A total of 96 primary snorers and 111 non-snorers were analysed. The primary snorers had significantly lower FMD at both baseline (8.2%±1.3% vs 8.5%±1.0%; P=0.037) and follow-up (8.2%±0.9% vs 8.5%±0.8%; P=0.002). At follow-up, 76 of 96 snorers had persistent sleep-disordered breathing, whereas 73 of 111 non-snorers remained snoring-free.

The persistent sleep-disordered breathing group had non-significantly lower FMD at baseline (8.2%±1.2% vs 8.6%±0.9%; P=0.061) and significantly lower FMD at follow-up (8.3%±0.9% vs 8.6%±0.8%; P=0.026). Nonetheless, there was no significant difference in the changes in FMD between the two groups (0%±0.9% vs 0%±0.8%; P=0.9). Further analysis revealed that new-onset OSA at follow-up was associated with higher ambulatory blood pressure.

This study had several limitations. The diagnosis of PS was based on parental reports. The sample size was too small to have sufficient power in subgroup analyses to explore the predictors and outcomes of different courses of disease progression over time. The control group was not sex-matched with the PS group.

Conclusions

This study demonstrated that persistent PS in children was not associated with reduced endothelial function (increased cardiovascular risk) over an average of 5 years. These findings suggest no causal relationship between PS and increased cardiovascular risk in children. Nonetheless, a proportion of children were found to have incident OSA, which was associated with a higher ambulatory blood pressure. Children with PS should be followed up regularly to monitor its possible progression and to prevent any possible cardiovascular complications. Primary snoring can be a subtle but chronic problem; longitudinal studies with a longer follow-up period and regular assessments are needed to determine the association of childhood PS with any cardiovascular events in adulthood.

Acknowledgements

This study was supported by the Health and Medical Research Fund, Food and Health Bureau, Hong Kong SAR Government (#01120736). We thank the nurses and health care assistants in wards 11K and 11L of the Prince of Wales Hospital for their assistance during admission of participants. We also appreciate the active participation of all participants and their parents.

Declaration

The authors have no conflicts of interest to disclose.

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