A meta-analysis of positive airway pressure treatment for cardiovascular prevention: why mix apples and pears?

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Findings

Among 356 MACEs and 613 deaths recorded, the authors found no significant association of PAP neither with MACEs (RR 0.77; 95% CI 0.53 to 1.13 and RD –0.01; 95% CI –0.03 to 0.01) nor with cardiovascular death (RR 1.15; 95% CI 0.88 to 1.50), all-cause death (RR 1.13; 95% CI 0.99 to 1.29), ACS (RR 1.00; 95% CI 0.65 to 1.55), stroke (RR 0.90; 95% CI 0.92 to 1.21) and heart failure (RR 1.03; 95% CI 0.92 to 1.16). Meta-regressions failed to identify any significant association of PAP with outcomes for different levels of apnoea severity, follow-up duration or adherence to PAP (all P values >0.13).

Commentary

The current meta-analysis is unfortunately compromised by a rather heterogeneous and inappropriate group of studies that included sleep clinic and as well as cardiac and cerebrovascular cohorts. Studies that examined primarily OSA and CSA were included. This may be problematic since OSA is considered to be a risk factor for cardiac disease, and CSA can be a consequence of cardiac disease in populations with sleep-disordered breathing. Primary outcomes were quite different (for instance, the Apnea Positive Pressure Long-term Efficacy Study (APPLES) trial), and studies that involved primary and secondary prevention of CVD were included. The follow-up varied substantially (6–68 months) as well as the sample sizes (n=83 to n=2717). The analysis was hampered by poor adherence with the exception of the Parra et al report. Taking the above limitations into account, particularly the inappropriate combination of studies as well as the rather uniform low adherence, it is difficult to draw firm conclusions regarding the value of PAP in mitigating cardiovascular risk.

Implications for practice

What can we take away from this report? First, excluding significant sleepiness in PAP RCTs may be excluding populations that would benefit from treatment. This work highlights that adequate adherence in these cohorts is a considerable clinical challenge. Second, there appears to be a differential response to patient-centred measures of improvement (sleepiness and quality of life) versus improvement in cardiac outcomes. The later may require more complete treatment (ie, adherence throughout the entire sleep period) and particularly treatment during rapid eye movement sleep. Further, carefully designed RCTs are needed to address the limitations noted above before we abandon PAP therapy in patients with OSA at risk or with established cardiovascular disease.

Competing interests None declared.

Provenance and peer review Commissioned; internally peer reviewed.

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