Title:	**Unattended sleep studies in the diagnosis and reassessment of obstructive sleep apnoea**
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AIM

To assess the safety, effectiveness and cost-effectiveness of unattended sleep studies for the diagnosis and reassessment of obstructive sleep apnoea (OSA) as an alternative to laboratory-based (attended) polysomnography (PSG), given the current long waiting lists associated with PSG testing.

RESULTS AND CONCLUSIONS

Eighty studies were included in a systematic literature review, among which 14 investigated the use of unattended sleep studies for the diagnosis of OSA in a non-specialised unit setting, another 60 in a referral setting, and the remaining 6 in a paediatric setting. There were no studies identified which provided evidence of the use of unattended sleep studies to reassess treatment efficacy in patients with OSA.

Safety

Trivial adverse events, eg skin redness and itching, were reported in one uncontrolled case series. Overall, unattended sleep studies were found to be safe diagnostic investigations. No comparative data were identified that could inform the safety of unattended sleep studies relative to attended PSG. Physical and psychological harms are theoretically possible as a consequence of false positive results from an unattended sleep study and subsequent unnecessary treatment. An earlier (less waiting time) or delayed (false negative results) diagnosis of OSA using unattended sleep studies was not expected to impact on the relative safety and effectiveness of these tests, as patients with suspected OSA are currently triaged for attended PSG on the basis of symptom severity.

Effectiveness

In all healthcare settings, diagnosis of OSA with the aid of unattended sleep studies and subsequent treatment provided a benefit in terms of improving symptoms and reducing apnoea-hypopnoea events. Level 2 unattended sleep studies demonstrated moderate to high test accuracy relative to the gold standard of attended PSG, at various apnoea-hypopnoea index thresholds. In the higher quality literature, Level 3 unattended sleep studies were found to have generally moderate-high test accuracy, whilst the results for Level 4 studies were heterogenous but with a general trend towards poor test accuracy - probably as a consequence of the fewer cardio-respiratory signals recorded during testing. Evidence was available from a randomised controlled trial and two cohort studies of moderate to poor quality which compared Level 4 unattended sleep studies with attended PSG in a referral setting. Changes in patients' health outcomes following diagnosis with Level 4 studies were not significantly different from those achieved following diagnosis with attended PSG, suggesting that any deficiencies in the test accuracy of Level 4 studies appeared to have been compensated by clinical judgement and management.

Cost-effectiveness

The costs for the proposed OSA diagnostic pathway involving unattended sleep studies was estimated at $691, $754 and $525 per person in a non-specialised unit setting, a referral setting and a paediatric setting, respectively. Unattended sleep studies were found to be cost-saving in the first two healthcare settings, when compared to laboratory-based PSG. However, the use of unattended sleep studies in diagnosing OSA would result in an additional cost in a paediatric setting, which is largely owing to the costs associated with unnecessary adenotonsillectomy in patients with a false positive diagnosis of OSA. The financial impact of reimbursing unattended sleep studies was considered to be significant, with the likelihood that patients with mild forms of OSA would receive a diagnosis and treatment that would otherwise not have been clinically indicated.

METHODS

Seven bibliographic databases, including Medline and Embase, and relevant internet sites were searched for the period 1980 – April 2009. Specific journals were hand searched and the reference lists of included studies were pearled. Studies were included in the review on the basis of pre-determined PICO selection criteria and reasons for exclusion were documented. Study quality was appraised, using appropriate checklists, data were extracted in a standardised manner, and findings were synthesised in a structured narrative.

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