Annual review of patients with sleep apnea/hypopnea syndrome: a pragmatic randomised trial of nurse home visit versus consultant clinic review

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Two methods for the annual review of patients diagnosed with obstructive sleep apnoea/hypopnoea syndrome (SAHS), who were being treated with constant positive airway pressure (CPAP) during sleep, were assessed. One was an annual review at home by a specialist nurse, while the other was an annual review given in hospital by a consultant.

Type of intervention
Other: Management care.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients diagnosed with SAHS and who had a CPAP machine.

Setting
The setting was the community and secondary care in the highlands and Western Isles of Scotland, UK. The economic study was carried out in the UK.

Dates to which data relate
The effectiveness and resource evidence was from the period January to December 2001. No price year was given.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The same patients provided both the effectiveness and cost data. The costing was carried out prospectively.

Study sample
No power calculations were reported. All patients who filled in the questionnaires at baseline and at 3 months were included in the study. A total of 174 patients were originally part of the study. These were randomised to receive either a hospital-based consultant review appointment, or a home visit from a specialist nurse (87 patients in each group). The authors did not report any evidence that the study sample was representative of the study population.

Study design
This study was based on a multi-centred, randomised controlled trial (RCT), with 3 months' follow-up after the review appointment. Eleven patients (4 in the nurse group and 7 in the consultant group) returned their CPAP machine before they were due to receive their baseline questionnaire. Eleven patients were not sent a follow-up questionnaire. One patient who returned the follow-up questionnaire had not returned the baseline questionnaire, while a further patient returned the CPAP machine after receiving the follow-up questionnaire. In the end, both baseline and follow-up questionnaires were available for 139 patients (80% of the target population), corresponding to 68 patients (66 males) in the nurse home visit group and 71 patients (67 males) in the consultant clinic group. The mean ages of these patients were 54 years (nurse group) and 55 years (consultant group), respectively.

**Analysis of effectiveness**

The analysis of the clinical study was conducted on the basis of treatment completers only. The primary health outcomes used were the SAHS symptom score, Epworth score, Hospital Anxiety and Depression Scale (HADS) and the Short Form-36 (SF-36). The two patient groups were comparable in most respects except in two sub-scales of the SF-36 (general health and role functioning-physical), where the scores in the consultant group were significantly lower, (p=0.0022 and p=0.0307, respectively).

**Effectiveness results**

There was no statistically significant difference between the two groups of patients in their symptom scores, although both groups showed an improvement from baseline in their symptom scores. The nurse group showed a mean change of -2 (standard deviation, SD=7, p=0.023) and the consultant group showed a mean change of -3 (SD=7, p=0.003).

In the consultant group, the general health score improved by 5 points (SD=14) and the social functioning score improved by 9 points (SD=29), (p<0.025).

There were no differences in Epworth score, HADS score or SF-36 scores between the groups.

More than half the patients seen by a consultant were then referred to the specialist nurse for practical advice.

**Clinical conclusions**

The authors concluded that both methods of conducting an annual review of SAHS patients, that is, home-based nurse or hospital-based consultant, were equally effective at improving clinical outcomes.

**Measure of benefits used in the economic analysis**

No summary measure of benefit was produced as the authors carried out a cost-consequences analysis.

**Direct costs**

Discounting was not relevant, as all the costs were incurred during a very short time period, and was appropriately not conducted. The direct costs included were for consultant time, patient travel time, companion costs, provision of care for dependents during the appointment, specialist nurse time, nurse travel time and nurse transport costs. The duration of the consultant visit was recorded by the clinic staff. The cost to the patient of attending the clinic was obtained from a standard patient questionnaire. The source of the cost of the specialist nurse visit was not given. Some costs (e.g. consultant time) were broken down into prices and quantities. The costs were derived from actual data. No price year was given. The costs reported were the mean cost (SD) per patient and the total cost (SD) of each intervention.

**Statistical analysis of costs**

No statistical analysis of the costs was carried out. Some mean values (SD) for the resources used and costs were reported.
Indirect Costs
The work time lost by patients as a consequence of their clinic visit was calculated. This cost was obtained from a standard patient questionnaire. The costs and the quantities were reported separately. No discounting was carried out. No price year was given.

Currency
UK pounds sterling (£) and US dollars ($). No conversion rate was reported.

Sensitivity analysis
No sensitivity analysis was carried out.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The National Health Service (NHS) cost of a consultant visit was 6.21 (SD=3.99) ($9.94, SD=6.38). The cost to the patient was 23.63 (SD=23.21) ($37.81, SD=37.13).

The average cost of a specialist nurse home visit was 52.26 (SD=49.85) ($83.62, SD=79.76), of which the time spent with the patient cost 6.57 (SD=1.43) ($10.51, SD=2.29).

The costs of specialist nurse visits recommended by the consultant were not included.

Synthesis of costs and benefits
The costs and benefits were not combined as the study was, in effect, a cost-consequences analysis.

Authors' conclusions
Both methods of conducting an annual review for sleep apnoea/hypopnoea syndrome (SAHS) patients were equally effective. However, the specialist nurse home visit was more expensive than the visit to the consultant.

CRD COMMENTARY - Selection of comparators
The selection of the comparators (home-based specialist nurse visit or a visit by the patient to the consultant) was justified on the grounds that they were both used by the NHS in Scotland. You should decide if the comparators are widely used technologies in your own setting.

Validity of estimate of measure of effectiveness
The source of the effectiveness data was a single study. The study design, an RCT, was appropriate for the study question as well-conducted RCTs are considered the 'gold' standard study design when comparing different health interventions. However, it was unclear whether the patients who had been advised to see a specialist nurse after their consultant visit were assessed after their subsequent appointment with a specialist nurse. The study sample was representative of the study population. The patient groups were not shown to be comparable in all respects at baseline. This lack of comparability was not taken into consideration in the analysis, and it was unclear how this affected the results. No sensitivity analysis on the health outcomes was carried out.

Validity of estimate of measure of benefit
The authors did not derive a summary measure of health benefit. The analysis was one of cost-consequences, therefore
the health benefits were those associated with the effectiveness outcomes.

Validity of estimate of costs
The authors adopted a societal perspective and most of the relevant costs were included in their analysis. However, the authors did not take those costs arising from the annual review (e.g. an appointment with the specialist nurse recommended by the consultant) into consideration, although they were aware of its importance. This would have underestimated the cost of the consultant appointment. They also assumed that the work time lost resulting from a nurse home visit was zero, which would have underestimated the cost of the nurse home visit. Some costs, but not all, were reported separately from the quantities, which will increase the generalisability to other settings. The quantity data were taken from a single study, while the prices were taken from the authors' setting. No statistical, sensitivity or other analyses of the quantities or prices were performed. This limits the interpretation of the results. The authors converted the prices reported from pounds sterling into dollars. The price year was not reported (but it was almost certainly 2001), which will prevent any possible inflation exercises.

Other issues
The authors made some comparisons of their results with those from other studies. The issue of generalisability to other settings was not explicitly addressed, although the authors were aware that the geographical area in which the study took place had exceptionally high transport costs in terms of time and money. The authors did not present their results selectively and their conclusions reflected the scope of the analysis. They did not report any further limitations of their study.

Implications of the study
The authors argued that from a clinical perspective, patients did not experience any difference in outcomes whether they had their annual review in a consultant-led clinic, or at home with a visit from a specialist nurse. However, for the NHS, it was more costly to run a home visit review, as the costs of transport in this remote area were so high. The authors suggested that as a specialist nurse review appears equally effective, the NHS could reduce the costs by offering it in a less costly way.

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