Cost-effectiveness and degree of satisfaction with home sleep monitoring in patients with symptoms of sleep apnea

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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.

CRD summary
This study examined the diagnostic accuracy, patient satisfaction, and economic implications of home sleep monitoring for sleep apnoea or hypopnoea syndrome compared with conventional polysomnography. The authors concluded that home sleep monitoring was an effective and economically attractive alternative to conventional polysomnography. The study was generally well conducted, but the analysis focused mainly on the clinical and diagnostic features of the two strategies. The authors’ conclusions appear to be valid, but context specific.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study examined the diagnostic accuracy, patient satisfaction, and economic implications of home sleep monitoring for the diagnosis of sleep apnoea or hypopnoea syndrome in comparison with conventional polysomnography.

Interventions
Home sleep monitoring based on a bedside system was compared against conventional polysomnography. The recording time was six hours for both home sleep monitoring and polysomnography and the same types of sensors were used for both tests.

Location/setting
Spain/home and hospital.

Methods
Analytical approach:
The analysis was based on a single study with a very short time horizon. The authors did not explicitly state the perspective adopted.

Effectiveness data:
The clinical evidence was derived from a within-group comparison study that enrolled a sample of 52 patients (42 men and 10 women, with a mean age of 51.8 ± 9 years), who underwent both diagnostic procedures within two weeks in a random order. The physician reviewing all the results was blinded to the procedure assigned to the patient. The inclusion and exclusion criteria for enrolment in the study were reported. No patient follow-up was carried out after the results of the two diagnostic procedures. The key clinical endpoints were the diagnostic accuracy of home sleep monitoring measured by the apnoea-hypopnoea index (AHI) and patient satisfaction, which was assessed using a visual analogue scale. Polysomnography was considered to be the gold standard procedure.

Monetary benefit and utility valuations:
Not included.

Measure of benefit:
No summary benefit measure was used. The main clinical outcomes were the diagnostic accuracy and patient satisfaction.
Cost data:
The economic analysis included the costs of personnel (time and travel) and the cost of hospital stay. Personnel costs were calculated using technicians’ annual salary and hospital stay was based on charges at the authors’ institution. The costs of the devices, disposable material, and maintenance were excluded. Resource quantities were from the actual consumption of resources in the authors’ centre. All costs were in Euros (EUR) and the price year was not reported.

Analysis of uncertainty:
Not investigated.

Results
The AHI of polysomnography was 33.6 and that of home sleep monitoring was 31 (p<0.001). For patients with an AHI of 10 or more, recorded with polysomnography, home sleep monitoring had a sensitivity of 89% and a specificity of 80%. For patients with severe sleep apnoea or hypopnoea syndrome (an AHI of 30 or more, with polysomnography) the sensitivity and specificity were both 100%.

Patient satisfaction was significantly greater with home sleep monitoring (scored nine) than with polysomnography (scored seven, p<0.0001).

The total cost was EUR 153.46 with home sleep monitoring and EUR 254.80 with polysomnography.

Authors’ conclusions
The authors concluded that home sleep monitoring was an effective and economically attractive alternative to conventional polysomnography.

CRD commentary
Interventions:
The rationale for the selection of the comparators was clear as the proposed intervention was compared with the usual diagnostic approach, which was overnight polysomnography in a sleep laboratory and this was considered to be the gold standard for patients with suspected sleep apnoea or hypopnoea syndrome.

Effectiveness/benefits:
The clinical analysis was based on a single group of patients who underwent both diagnostic techniques and so these patients acted as their own controls. The consecutive enrolment of patients, with a random order for the two procedures, should limit potential selection bias. To reduce assessment bias, the assessors were blinded to the technique performed. Extensive statistical tests were used to assess the significance of differences between the two procedures. The instrument used to evaluate the clinical impact of the two procedures was appropriate. Two potential limitations were that no justification was given for the study sample size and patients were enrolled from a single institution, which might not have been representative of other patient populations.

Costs:
The economic viewpoint was not explicitly stated, but appears, from the categories of costs and their sources, to have been that of the hospital. Some key information on the resource quantities and costs was provided, but the price year was not clearly reported, which limits the possibility of replicating the analysis in other time periods. The costs were treated deterministically and no statistical tests were carried out. The authors stated that the purchase cost of the devices was not included because this was difficult to calculate for instruments that were used for several years. The costs of disposable items were not considered, as they were similar for the two procedures.

Analysis and results:
The results were clearly presented and illustrated. A cost-consequences analysis was carried out and this might limit the possibility of comparing these results with those from other studies, given the lack of a summary benefit measure and a formal cost-effectiveness ratio. The issue of uncertainty was not addressed and sensitivity analyses were not carried out. The authors stated that their results should be considered to be specific to their institution and were not transferable to other contexts.
Concluding remarks:
The study was generally well conducted, but the analysis focused mainly on the clinical and diagnostic features of the two strategies. The authors' conclusions appear to be valid for the specific context.

Funding
Partly funded by the Neumosur Foundation.

Bibliographic details

PubMedID
17983544

Original Paper URL
http://www.elsevier.es/revistas/ctl servlet?_f=7212&articuloid=13112223&revistaid=260

Indexing Status
Subject indexing assigned by NLM

MeSH
Cost-Benefit Analysis; Female; Home Care Services /economics; Humans; Male; Middle Aged; Patient Satisfaction; Polysomnography /economics; Sleep Apnea, Obstructive /diagnosis /economics; Spain

AccessionNumber
2200800209

Date bibliographic record published
13/05/2009

Date abstract record published
16/06/2010