Diagnostic yield and optimal duration of continuous-loop event monitoring for the diagnosis of palpitations: a cost-effectiveness analysis

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
Using continuous-loop event recorders in the diagnosis of palpitations.

Type of intervention
Diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
Ambulatory patients referred for the placement of a continuous-loop event recorder for the diagnosis of palpitations.

Setting
Hospital. The economic study was carried out in Massachusetts, USA.

Dates to which data relate
The effectiveness and resource use data corresponded to patients referred to the study hospital in 1996. The prices used were from 1997.

Source of effectiveness data
The evidence for final outcomes was derived from a single study.

Link between effectiveness and cost data
The costing was undertaken prospectively on the same patient sample as that used in the effectiveness analysis.

Study sample
Power calculations were not used to determine the sample size. 112 patients were included in the sample. 7 patients were excluded (6%) from the total. As a result, 105 patients with a mean age of 52 (SD, 21) years were monitored for 1 week, 101 for 2 weeks, 72 for 3 weeks, and 17 for 4 weeks.

Study design
Prospective cohort study, carried out in a single centre. The duration of the follow-up of the loop recorder was 4 weeks. No loss to follow-up was stated.
Analysis of effectiveness
The principle (intention to treat or treatment completers only) was not explicitly specified. The primary outcome was the diagnostic yield as measured by the number of new diagnoses per monitored patient per week.

Effectiveness results
The diagnostic yield was 1.04 (95% CI: 0.84 - 1.24) diagnoses per monitored patient in week 1, 0.17 (95% CI: 0.08 - 0.25) new diagnoses per monitored patient in week 2, and 0.01 (95% CI: 0 - 0.04) diagnoses per monitored patient week 3 and beyond. The corresponding values for the diagnostic yield in terms of serious diagnoses by week of monitoring were 0.29 (95% CI: 0.19 - 0.39), 0.08 (95% CI: 0.03 - 0.14), and 0, respectively.

Clinical conclusions
The diagnostic yield of continuous-loop event recording decreases rapidly after two weeks of monitoring.

Measure of benefits used in the economic analysis
The benefit measure was diagnostic yield.

Direct costs
Costs were not discounted due to the short time frame of the study. Quantities and costs were reported separately. The monitoring costs included the costs of monitoring equipment (cost of the continuous-loop event recorder and the cost of the central monitoring station), laboratory technical staff (number of transmissions per week and technicians wage plus benefits) and the interpreting physician (basis: 1997 Medicare Fee Schedule). The perspective adopted in the cost analysis was that of a medical care system. 1997 price data were used.

Indirect Costs
Not included.

Currency
US dollars ($).

Sensitivity analysis
A sensitivity analysis was not carried out.

Estimated benefits used in the economic analysis
The diagnostic yield was 1.04 (95% CI: 0.84 - 1.24) diagnoses per monitored patient in week 1, 0.17 (95% CI: 0.08 - 0.25) new diagnoses per monitored patient in week 2, and 0.01 (95% CI: 0 - 0.04) diagnoses per monitored patient week 3 and beyond. The corresponding values for the diagnostic yield in terms of serious diagnoses by week of monitoring were 0.29 (95% CI: 0.19 - 0.39), 0.08 (95% CI: 0.03 - 0.14), and 0, respectively.

Cost results
The cost of each week's monitoring was $102 (week 1), $96 (week 2), and $81 (week 3 and beyond).

Synthesis of costs and benefits
The estimated benefits and costs were combined as cost per new diagnosis (as the incremental cost-effectiveness ratio): cost per "any diagnosis" and cost per "serious diagnosis". An incremental analysis was performed. The cost per "any diagnosis" was $98 in the first week, $576 in the second week and $5,832 in the third week. The cost per "serious
“diagnosis” was $340 (week 1), $1,224 (week 2) and infinite (week 3).

Authors’ conclusions
A 2-week monitoring period is reasonably cost-effective for most patients. Although the cost continues to increase with more prolonged monitoring, little additional diagnostic yield is obtained by extending the monitoring period to 4 weeks.

CRD COMMENTARY - Selection of comparators
A justification was given for the choice of the comparator. It was regarded as the standard practice in the context in question. You, as a database user, should consider whether 1-month monitoring is a widely used health technology in your own setting.

Validity of estimate of measure of benefit
The benefit results are likely to be internally valid due to the prospective nature of the study design.

Validity of estimate of costs
Quantities were reported separately from the costs and adequate details of methods of cost estimation were given.

Other issues
A sensitivity analysis could have been performed to test the robustness of the results.

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