Magnetic resonance imaging: a cost-effective first line investigation in the detection of vestibular schwannomas

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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.

Health technology
Magnetic resonance imaging (MRI) as a first line test in the detection of vestibular schwannomas.

Type of intervention
Screening and diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with a unilateral or asymmetrical sensorineural hearing loss.

Setting
Institution. The economic study was carried out in Manchester, UK.

Dates to which data relate
The effectiveness and resource use data were collected from September 1991 to March 1993. No dates for prices were specified.

Source of effectiveness data
Single study.

Link between effectiveness and cost data
Although the costing was conducted alongside the effectiveness study, it was not clear whether it was undertaken using the same patient sample as that in the effectiveness study.

Study sample
139 patients underwent MRI during the 18-month period. Nine clinical cases were reported in detail. No power calculations were reported. No details were given of patients who refused to participate or who were excluded for other reasons.

Study design
This was a case series study from a single centre. Case notes of patients in whom a vestibular schwannoma was demonstrated on MRI were studied. The results of CT and audiovestibular tests were also examined and cases were
noted which were either equivocal or negative. The follow-up period ended at diagnosis as determined by MRI.

Analysis of effectiveness
The principle used in the analysis (intention to treat or treatment completers only) was not relevant to the study results. The primary health outcome studied was the proportion of correct diagnoses, which were considered to result in an improved quality of life for the patient. Patients undergoing MRI treatment were compared with those who had CT treatment. MRI was defined as the 'gold standard', or reference test, due to its previously observed high specificity (almost 100%).

Effectiveness results
In the 139 patients undergoing MRI, 21 tumours were identified, giving a detection rate of 15%. In 9 cases (7%), audiovestibular tests and CT findings were either suspicious or equivocal.

Clinical conclusions
The nine cases cited show that the conventional investigative protocol for a unilateral or asymmetrical sensorineural hearing loss will occasionally miss small, predominantly intrameatal tumours.

Measure of benefits used in the economic analysis
The benefit measures were the reduction of pre-, intra-, and post-operative morbidity and possible mortality from vestibular schwannoma.

Direct costs
Some quantities were reported separately from costs. Costs associated with diagnostic tests were included in the analysis. The costs covered technician time and use of equipment. The data were obtained from the authors' institution (UK). No price date was given.

Currency
UK pounds sterling (GBP).

Sensitivity analysis
No sensitivity analysis was not carried out.

Estimated benefits used in the economic analysis
A detection rate of 15% resulted in 21 tumours being identified in MRI patients. In 9 cases (7%), audiovestibular tests and CT findings were either suspicious or equivocal. By correctly detecting those equivocal and suspicious cases using MRI, the consequent early detection and excision of the tumours reduces the pre-, intra-, and post-operative morbidity and possible mortality.

Cost results
The total cost for the 'conventional strategy' was 188.22. The total cost of the limited MRI strategy was 180.05, and the total cost of the strategy substituting CT for MRI was 114.22.

Synthesis of costs and benefits
The authors did not combine costs and benefits. They considered that the MRI strategy was likely to dominate the others once the follow-up costs were included.
Authors' conclusions
Limited protocol MRI compares favourably with the traditional line of investigation both in cost and patient acceptability. Although it is slightly more expensive, it is much more cost-effective than the usual battery of tests. It is the most sensitive test currently available for treatment of vestibular schwannoma, and satisfies the medico legal requirements. MRI is both a diagnostic and cost-effective screening tool, and should be the first line choice of investigation for patients in whom the clinical picture requires exclusion of a retrocochlear lesion.

CRD Commentary
No statistical or sensitivity analyses were carried out. The applicability of these results to other settings should be further investigated. The report of the methodology used in defining the sample design and the costing lacked detail. In particular it should be noted that no price date was given.

Implications of the study
Further analysis of the data may be needed in order to analyse both the validity and generalisability of the study results.

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None stated.

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