Hearing impairment in infants after meningitis: detection by transient evoked otoacoustic emissions
Francois M, Laccourreye L, Huy E T, Narcy P

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
Transient evoked otoacoustic emissions (TEOEs) in hearing impairment assessment after meningitis.

Type of intervention
Screening.

Economic study type
Cost-effectiveness analysis.

Study population
39 children aged 6 to 24 months recovering from a purulent meningitis.

Setting
Hospital. The study was carried out in Paris, France.

Dates to which data relate
The resource use data were collected between 1989 and 1995. The price year was not reported.

Source of effectiveness data
The estimate of effectiveness was based on opinion.

Methods used to derive estimates of effectiveness
The estimates of effectiveness were based on an implicit assumption of the authors.

Estimates of effectiveness and key assumptions
Both strategies were equally effective in detecting patients with unilateral or bilateral sensorineural hearing loss (SNHL).

Measure of benefits used in the economic analysis
Since the effectiveness analysis assumed equal benefits from the two strategies, the economic analysis was based on the difference in costs only.

Direct costs
The quantities of tests performed, by type of test, were reported separately from the costs. The costs measured were
those associated with the screening and diagnostic tests at the study hospital. However, no details were provided about the methodology employed to calculate such figures. The cost estimation for the intervention was based on actual data from a tertiary care institution in Paris, France. The costs associated with the comparator were calculated based on a previous protocol employed in the hospital. The price year was not reported.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analysis was performed.

**Estimated benefits used in the economic analysis**
Not applicable.

**Cost results**
The total cost of the intervention was $3,160, with the mean cost per child tested being $81 (range: $40 - $200). The comparator would have cost $5,820, with the mean cost being $150 (range: $140 - $180). The corresponding mean costs per child with unilateral or bilateral SNHL diagnosed were $790 and $1,455, respectively for the intervention and control groups (P<0.001).

**Synthesis of costs and benefits**
Not applicable.

**Authors' conclusions**
It is cheaper to assess a possible hearing impairment after purulent meningitis in an infant by using TEOE recording than by using ABR recording. Further evaluation by impedance audiometry, ABR testing, and behavioural audiometry is only needed to obtain precise auditory thresholds if TEOEs are absent.

**CRD COMMENTARY - Selection of comparators**
The authors justified the choice of comparator in terms of the experience at their own institution. The screening strategy investigated used the recordings of TEOEs and VRA as initial tests after meningitis, with further impedance audiometry and ABR being performed on patients with no TEOEs or abnormal VRA findings. This was compared with a universal strategy involving VRA, ABR and impedance audiometry for all children. You, as a user of this database, should consider whether this is a widely used strategy for the diagnosis of sensorineural hearing loss in patients recovering from purulent meningitis in your own setting.

**Validity of estimate of measure of benefit**
The authors implicitly assumed that both strategies would yield the same outcome. The validity of this assumption was not discussed by the authors. More information regarding the documentary evidence of the effectiveness of screening is thus desirable.

**Validity of estimate of costs**
Although the quantities and types of tests performed were reported separately from the costs, the analysis did not report adequate details of either the costing methodology or the year to which the prices referred. Thus any relevant costs omitted from the analysis cannot be identified.
Other issues
The conclusions reached by the authors were not fully justified given the uncertainties in the data and the lack of information needed for such assessment. The possible changes in cost estimates due to variation in the number of measurements needed or in time needed for one measurement (e.g. due to interfering noises by the infants) was not investigated using appropriate sensitivity analysis.

The generalisability of the findings was not addressed, therefore, the costs of the compared diagnostic strategies may not be applicable to other hospitals or other countries. Comparison with a previous clinical study investigating TEOEs in children recovering from bacterial meningitis found lower TEOEs rate. This difference was explained by the authors as being due to a difference in timing of the measurement. No comparisons with other studies reporting cost-effectiveness of comparative diagnostic strategies were reported. The results were not presented selectively.

Source of funding
Supported by a grant from the Assistance Publique Hopitaux de Paris (contract EMUL 930701, contrat Delegation a la Recherche Clinique CRC 920801) and the Conseil de la Ville de Paris (Recherche clinique en milieu hospitalier 27/12/93).

Bibliographic details

PubMedID 9152278

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Acoustic Impedance Tests; Child, Preschool; Cost-Benefit Analysis; Evoked Potentials, Auditory, Brain Stem; Feasibility Studies; Female; Hearing Loss, Sensorineural /diagnosis /etiology; Humans; Infant; Male; Meningitis, Bacterial /complications; Otoacoustic Emissions, Spontaneous; Prospective Studies

AccessionNumber 21997000717

Date bibliographic record published
30/11/1998

Date abstract record published
30/11/1998