Cost-effectiveness evaluation of vaccination against Haemophilus influenzae invasive diseases in France

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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
Vaccine against Haemophilus influenzae type b (Hib).

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis and cost-utility analysis.

Study population
The study population was a hypothetical cohort of the entire generation of French children aged under five years in 1990 (n= 3,746,000).

Setting
Primary care. The study was carried out in France.

Dates to which data relate
Effectiveness data were collected from studies previously published between 1989 and 1995. The cost data were partly derived from a study published in 1992 and also the national health insurance system. The price year was 1993.

Source of effectiveness data
Effectiveness data were derived from a review of previously completed studies.

Modelling
A model was used to combine input parameters and generate the cost-effectiveness and cost-utility ratios. The details of the model, however, were not provided in the paper.

Outcomes assessed in the review
The review assessed the following outcomes: annual observed incidence of Hib invasive diseases, annual observed incidence of meningitis and epiglottitis induced by Hib, mortality rate for meningitis associated with Hib infection, the category of sequelae induced by Hib-associated meningitis, and the effectiveness and rate of vaccination.

Study designs and other criteria for inclusion in the review
Not stated.
Sources searched to identify primary studies
Not stated.

Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
Approximately 8 studies were included in the review.

Methods of combining primary studies
Not stated.

Investigation of differences between primary studies
Not stated.

Results of the review
The annual observed incidence of Hib invasive diseases was about 28 cases/100,000 children aged under 5 years. The annual observed incidence of meningitis induced by Hib reached 17/100,000 children aged under 5 years, while that of epiglottitis induced by Hib was 3-4/100,000 children aged under five years. The mortality rate for meningitis associated with Hib infection was 3.6%. Hib-associated meningitis leads to severe sequelae in 1% of cases, to moderate sequelae in 10% of cases and to auditory sequelae in another 5-10% of cases. The effectiveness of vaccination is close to 100%. PRP-T vaccination does not increase the side-effects habitually provoked by DTCP injections. A compliance rate of 100% was used. These data formed the principal input parameters (effectiveness/outcomes) of the model.

Measure of benefits used in the economic analysis
The number of Hib diseases, the number of deaths induced by Hib, the number and category of sequelae and Quality Adjusted Life Years (QALYs) were used as measures of benefit. The authors used the QALY matrix developed by Rosser and Kind. The French version of the Gudex and Kind questionnaire was used to classify health states according to the different clinical forms of Hib infections and their outcomes. Scores were based on experts’ opinion. A follow-up period of 10 years was used.

Direct costs
A discount rate of 6% was applied to costs. Quantities and costs were reported separately. Direct costs included the costs of the vaccine and costs of care for Hib infections. The quantity/cost boundary adopted was that of the health service. The estimation of quantities and costs was based on actual data. Estimates were derived from three sources: Caisse Nationale d’Assurance Maladie, a previously published study, and a group of otorhinolaryngologists. The price year was 1993.

Statistical analysis of costs
Not reported.
Indirect Costs
Not included.

Currency
French Francs (Ffr) with US$1 = Ffr5.5

Sensitivity analysis
A sensitivity analysis was conducted on variables related to meningitis, the category of sequelae, non-meningitis Hib diseases, the vaccine and the discount rate.

Estimated benefits used in the economic analysis
In ten years, the vaccination programme would prevent 9,731 cases of Hib diseases, 252 deaths, 60 severe sequelae and 1,190 moderate or auditory sequelae. The vaccination programme would result in a gain of 18,904 life years or 30,026 QALYs.

Cost results
The costs would amount to Ffr215.1 million.

Synthesis of costs and benefits
Cost-effectiveness would be Ffr102,748 per life year saved. Cost-utility would be Ffr64,688 per QALY. 4 variables had a significant influence on the results in terms of cost per life year saved: incidence of meningitis, meningitis mortality rate, number of vaccine doses needed to assure efficacy, and the discount rate.

Authors' conclusions
Compared to the cost-effectiveness of other medical interventions, the vaccination against Hib appears remarkably cost-effective.

CRD COMMENTARY - Selection of comparators
rationale for the choice of the comparator was clear. You, as a user of the database, should consider whether this technology is relevant to your own setting and country.

Validity of estimate of measure of benefit
en the occurrence of different categories of sequelae, the authors used quality of life measurements. The benefits of the vaccination programme are probably underestimated. The authors noted that if such a programme were implemented, the number of Hib carriers would be rapidly reduced and the risk for susceptible individuals would be reduced. The authors based their calculation of QALYs on the Rosser and Kind matrix which was developed with reference to a British population sample. QALY scores were derived from a panel of experts.

Validity of estimate of costs
y direct costs were included. Indirect costs associated with the loss of production due to the disease were not included. Cost calculations were based on average costs rather than marginal costs. Cost estimates were derived from French sources and expert opinion and may not be generalisable to other settings or countries.

Other issues
use of 'international' data, identified by the authors, reflected a lack of suitable sources from a French origin.
Implications of the study
The results of this study justify the recent decision by the French government to reimburse the pentavalent vaccine and to authorise its use on a large scale for the French population.

Source of funding
None stated

Bibliographic details

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Other publications of related interest


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