Cost-effectiveness of antibiotic prophylaxis for dental procedures in patients with artificial joints

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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
Antibiotic prophylaxis using erythromycin or penicillin.

Type of intervention
Primary prevention.

Economic study type
Cost-utility analysis.

Study population
Patients with artificial joints.

Setting
The study was carried out in the USA.

Dates to which data relate
Price related to 1986.

Source of effectiveness data
Literature and authors' assumptions.

Modelling
Epidemiological cohort model (model of survival and disease).

Measure of benefits used in the economic analysis
Quality-adjusted life years. 4 descriptive states were used for the health state description. Author values were used to assess the health states.

Direct costs
Direct costs were to the health service. For erythromycin the costs were: drug acquisition and prescribing, and treatment of artificial joint infection. For penicillin the costs were: drug acquisition and prescribing, treatment of artificial joint infection, and allergic reaction to penicillin. Price information related to 1986.
Currency
US dollars ($). In the DH Register of Cost-Effectiveness Studies, the original results were converted to UK using GDP purchasing power parities, and reflated to 1991, using the NHS pay and prices index.

Sensitivity analysis
Sensitivity analysis was carried out using the method of single parameter variation.

Estimated benefits used in the economic analysis
For erythromycin, QALYs were 16.999, and for the comparator QALYs were 16.997; therefore the incremental QALYs per patient were 0.0002. For penicillin, QALYs were 16.996, and for the comparator QALYs were 16.997. Therefore incremental QALYs per patient were -0.0001. Benefits were not discounted. Outcome duration was life long and treatment side-effects were included.

Synthesis of costs and benefits
Intervention and cost durations were less than 1 year. Costs and benefits were not discounted. Incremental cost per QALY gained for antibiotic prophylaxis using erythromycin was 10,700; for antibiotic prophylaxis, using penicillin, the incremental costs were positive and the incremental benefits were negative.

The range of incremental cost per QALY for erythromycin was 1080 (lowest value), there was positive incremental costs and negative incremental benefits for the highest value. For penicillin incremental costs were negative and incremental benefits were positive (lowest value); incremental costs were positive and incremental costs were negative for the highest value.

Sensitive parameters were probability of joint infection and case fatality rate from infection.

CRD Commentary
(This commentary was not written by CRD, but by the authors of the DH Register).

1) The study uses cohort data concerning the morbidity and mortality associated with dental infections haematologically transferred to the hip. There is no data on the efficacy of antibiotics to prevent this: evidence is taken from bacterial endocarditis prevention.

2) The medical evidence is highly uncertain and this is reflected by the wide range in the sensitivity analysis.

3) Normal life-expectancy is assigned to lives saved, this may be optimistic.

4) There were no health omissions.

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