Cost-effectiveness of perioperative mupirocin nasal ointment in cardiothoracic surgery

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
Perioperative mupirocin calcium nasal ointment in cardiothoracic surgery.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Male and female patients undergoing cardiothoracic surgery. No further details were provided.

Setting
Hospital. The economic study was carried out in Rotterdam, The Netherlands.

Dates to which data relate
The main effectiveness data were taken from a single study conducted in 1996. Resource and cost data were obtained from 1989-1992 sources. The price year was 1991.

Source of effectiveness data
The estimate of incidence of surgical-site infection (SSIs), mupirocin effectiveness and SSI-attributable postoperative length of stay (POLS) were obtained from a single study.

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

Study sample
An intervention group of 868 consecutive patients who underwent cardiothoracic surgery between March, 1991 and August, 1992 and a historical control group of 928 consecutive patients operated on between August 1989 and February 1991 were included in the analysis. No further details were provided. Power calculations to determine the sample size were not reported.

Study design
The study was a case control study with a follow-up of 5 days. The loss to follow-up was 14.4% in the intervention group. The loss to follow-up in the historical control group was not stated.
Analysis of effectiveness
The analysis of the clinical study was based on treatment completers only. The primary health outcomes used in the analysis were incidence of surgical-site infection (SSIs), mupirocin effectiveness and SSI-attributable postoperative length of stay (POLS).

Effectiveness results
The incidence of SSIs was 7.3% in the intervention and 2.8% in the historical control group (95% CI). Mupirocin effectiveness was 62%, resulting in 45 SSIs prevented per 1,000 patients undergoing surgery in the intervention group (95% CI). The SSI-attributable percentage postoperative length of stay was 21.4 days in the comparative and 10.5 days in the noncomparative group (95% CI).

Clinical conclusions
Perioperative mupirocin reduces the SSI rate and LOS.

Measure of benefits used in the economic analysis
The outcome measure used in the economic analysis was the number of SSIs prevented.

Direct costs
Manpower and materials for perioperative mupirocin nasal ointment costs were included in the analysis. The quantities and the prices were analysed separately. Discounting was not applied due to the short period of follow-up. The quantity/cost boundary adopted was that of the hospital. The price year was 1991.

Statistical analysis of costs
Two-sided Student's t test and Mann-Whitney U-Wilcoxon Rank Sum tests were used.

Indirect Costs
Overhead costs were included in the analysis. The quantities and the prices were analysed separately. Discounting was not applied due to the short period of follow-up. The quantity/cost boundary adopted was the hospital. The price year was 1991.

Currency
US dollars ($). A conversion rate of US$ 1 = 1.8 Dutch Guilders (Dfl) was applied.

Sensitivity analysis
A one-way sensitivity analysis was performed on the incidence of SSIs, effectiveness of mupirocin, SSI-attributable costs and costs of mupirocin treatment. Only changes in the SSI-attributable costs had a substantial effect on the cost-effectiveness ratio. Only if the SSI-attributable costs dropped below $245 per patient with an SSI would the cost-effectiveness ratio exceed zero.

Estimated benefits used in the economic analysis
The incidence of SSIs was 7.3% in the intervention and 2.8% in the historical control group (95% CI). Mupirocin effectiveness was 62%, resulting in 45 SSIs prevented per 1,000 patients undergoing surgery in the intervention group (95% CI). The SSI-attributable percentage postoperative length of stay was 21.4 days in the comparative and 10.5 days in the noncomparative group (95% CI).
Cost results
Mean SSI-attributable costs were $16,878. Discounting was not applied due to the short period of follow-up.

Synthesis of costs and benefits
The savings per SSI prevented were $16,633. As such an incremental analysis was performed.

Authors’ conclusions
The perioperative mupirocin calcium nasal ointment in cardiothoracic surgery has been shown to be highly cost-effective in most groups of patients undergoing cardiothoracic surgery.

CRD COMMENTARY - Selection of comparators
The reason for the choice of comparator is clear. Perioperative mupirocin calcium nasal ointment has been widely used in the elimination of nasal carriage of S. aureus, an important risk factor for the development of an SSI. You, as a user of this database, should consider whether these are widely used health technologies in your setting.

Validity of estimate of measure of benefit
The benefit measure (number of SSIs prevented) is likely to be internally valid. The data have not been used selectively although the study design, which uses historical controls, has its own limitations.

Validity of estimate of costs
Resource quantities were reported separately from the prices. Adequate details of the methods of quantity/cost estimation were given. Important cost items do not appear to have been omitted.

Other issues
The authors’ conclusions were likely to be justified given the uncertainties in the data. Both the issue of generalisability to other settings or countries and appropriate comparisons with other studies were made. Results were not presented selectively. The authors noted that the cost-effectiveness ratios of perioperative use of mupirocin may vary in different settings. Furthermore, the use of a historical control group could have biased the results due to unnoticed and uncontrolled temporal changes. Finally, the costs of mupirocin and reimbursement systems might be different in other countries.

Implications of the study
Further research is required in assessing the cost-effectiveness ratios of perioperative use of mupirocin, the costs of mupirocin and reimbursement systems in different settings/countries.

Source of funding
Supported by SmithKline Beecham Pharma, Germany.

Bibliographic details

PubMedID
8985764
Other publications of related interest
Comment in: Infection Control and Hospital Epidemiology 1996;17(12):775-9.

Indexing Status
Subject indexing assigned by NLM

MeSH
Administration, Intranasal; Anti-Bacterial Agents /economics /therapeutic use; Carrier State /drug therapy; Cost-Benefit Analysis; Drug Costs; Female; Hospital Costs; Humans; Infection Control /economics; Male; Middle Aged; Mupirocin /economics /therapeutic use; Nasal Mucosa /microbiology; Staphylococcal Infections /drug therapy; Staphylococcus aureus; Surgical Wound Infection /microbiology; Thoracic Surgery

AccessionNumber
21997000105

Date bibliographic record published
31/12/1998

Date abstract record published
31/12/1998