Study of direct variable anesthesia costs in the dilatation and curettage patient
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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
Use of three different anaesthetic strategies for patients receiving general anaesthesia for diagnostic dilatation and curettage (D&C). The three groups of anaesthetic drugs considered were: (1) thiopental and isoflurane, (2) propofol and isoflurane, and (3) propofol and desflurane.

Type of intervention
Anesthesia; diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
Patients receiving general anaesthesia for diagnostic D&C.

Setting
Tertiary care. The economic study was carried out in the USA.

Dates to which data relate
The dates of the effectiveness and resource use data collection were not explicitly specified (it was reported only as 'last three years'). The fiscal year seemed to be 1996 but, again, this was not explicitly reported.

Source of effectiveness data
Effectiveness data were derived from a single study. Costing was retrospectively performed on the same patient sample as that used in the effectiveness analysis.

Study sample
Power calculations were not used to determine the sample size. The study sample consisted of 194 patients with completed records, selected from a set of 755 charts reviewed. The number of patients in each study group was as follows:

(1) thiopental/isoflurane group (n=13) with a mean (SD) age of 49 (12.36) years,

(2) propofol/isoflurane group (n=126) with a mean (SD) age of 47.75 (12.16) years, and

(3) propofol/desflurane group (n=55) with a mean (SD) age of 49.76 (10.91) years.

Study design
This was a retrospective cohort study, carried out in a single centre. The duration of the follow-up was until discharge from hospital. Loss to follow-up was irrelevant given the retrospective study design involving selecting only those patients with completed records.

**Analysis of effectiveness**
The principle used in the analysis of effectiveness was treatment completers only. The patient outcomes were post-anaesthesia care unit (PACU) time, time from PACU until discharge from hospital, the rate of intubation, and the percentage of patients receiving antiemetics intraoperatively and in PACU. The patient groups were found to be comparable in terms of age, body mass index, and ASA physical status.

**Effectiveness results**
Mean (SD) PACU time was 66.5 (4.6) minutes in the thiopental/isoflurane group, 66.0 (16.9) minutes in the propofol/isoflurane group, and 67.9 (20.5) minutes in the propofol/desflurane group. The corresponding values in terms of time from PACU until discharge from hospital were 2.76 (1.4), 2.85 (1.5), and 2.82 (1.2) hours, respectively. The differences among the groups in terms of the two outcomes were not statistically significant. The rate of intubation was 84.6% in the thiopental/isoflurane group versus 66.8% in the propofol groups (66.8%), (p<0.001). The corresponding rates in terms of type of anaesthesia provider were 51% with the SRNAs (Student Registered Nurse Anaesthetist) versus 76.2% with the CRNAs (Certified Registered Nurse Anaesthetist) and 74.5% with the anaesthesia residents (p<0.001 for the comparison between SRNAs and the other two types of providers). The percentage of patients receiving antiemetics intraoperatively and in PACU was 0% in the thiopental/isoflurane group versus 10.3% in the propofol/isoflurane group and 14.5% in the propofol/desflurane group, (p<0.001).

**Clinical conclusions**
There was no difference in PACU or postoperative length of stay in the hospital across the three groups. There was no use of antiemetics intraoperatively or in PACU for the thiopental/isoflurane group compared with use in propofol groups.

**Measure of benefits used in the economic analysis**
No summary benefit measure was identified in the economic analysis, and only separate clinical outcomes were reported.

**Direct costs**
Costs were not discounted due to the short follow-up period considered in the study. Quantities of resource use were reported separately from the costs (but only in terms of time and drug doses). Cost components were reported separately. Cost analysis covered the costs of anaesthesia drugs, volatile agents, and personnel. The perspective adopted in the cost analysis was not explicitly specified. The sources of cost data were price lists, study institution, and personal communication with product manager. The date of the price data seemed to be 1996 (not explicitly specified). The cost analysis did not cover the costs of capital equipment.

**Statistical analysis of costs**
Although a statistical test (using either one-way analysis of variance, Bonferroni, or t test) was conducted to compare the study groups in terms of cost components and total cost, it was not explicitly specified which one was used.

**Indirect Costs**
Not considered.

**Currency**
US dollars ($).

**Sensitivity analysis**
Not conducted.

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

**Cost results**
The mean total anaesthesia cost was $77.90 (+/- $23.30) in the thiopental/isoflurane group, $82.90 (+/- $18.80) in the propofol/isoflurane group, and $87.10 (+/- $7.47) in the propofol/desflurane group (NS). The corresponding values in terms of type of anaesthesia provider were $83.17 (+/- $18.44) with the SRNAs (Student Registered Nurse Anaesthetist), $79.06 (+/- $18.11) with the CRNAs (Certified Registered Nurse Anaesthetist), and $82.93 (+/- $14.31) with the anaesthesia residents, (NS).

**Synthesis of costs and benefits**
Costs and benefits were not combined.

**Authors' conclusions**
The authors concluded that “an anaesthetic using thiopental/isoflurane is more cost-effective than propofol/desflurane or propofol/isoflurane anaesthetics and the postoperative length of stay is no different for the three anaesthetic approaches.”

**CRD COMMENTARY - Selection of comparators**
No specific anaesthetic approach was treated as the comparator.

**Validity of estimate of measure of benefit**
The internal validity of the effectiveness results cannot reasonably be guaranteed in view of the retrospective and non-randomised nature of the study. The sample size (n=13 for the thiopental/isoflurane group as opposed to 126 and 55 in the two propofol groups) may have been insufficient to detect significant differences between the types of anaesthesia. The study should be classified as a cost-consequences analysis.

**Validity of estimate of costs**
Quantities of resource use were only reported in general categories (time and drug doses) separately from the costs. However adequate details of methods of cost estimation were given. Cost results may not be generalisable to other settings.

**Other issues**
Given the lack of a prospective randomized design and sensitivity analysis, the results may need to be treated with some caution. The issue of generalisability to other settings or countries was not addressed. The study lacks a cost-effectiveness measure combining the costs and effects associated with each strategy. Appropriate comparisons were made with other studies.

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