Cost analysis of propofol versus thiopental induction anaesthesia in outpatient laparoscopic gynaecologic surgery

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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 Propofol and Thiopental anaesthesia in outpatient laparoscopic gynaecologic surgery.

Type of intervention
Anaesthetic.

Economic study type
Cost-effectiveness analysis.

Study population
Patients who underwent laparoscopic gynaecologic surgery.

Setting
Hospital. The economic study took place in New Jersey, USA.

Source of effectiveness data
Data was collected from operations performed from 1990-1993. 1993 prices were used.

Link between effectiveness and cost data
The effectiveness data was derived from a single study. It is not stated whether this costing was undertaken prospectively or retrospectively.

Study sample
The total study sample was 350 patients. 107 patients were excluded because they had characteristics that could have influenced postoperative recovery. There were 103 patients in the propofol group, and 140 in the thiopental group. Power calculations did not determine the sample size.

Study design
Retrospective case-control study. There was no loss to follow-up.

Analysis of effectiveness
The analysis was based on intention to treat. The primary health outcome used in the analysis was proxied by the duration of surgery and anaesthesia, and the presence of postoperative nausea and vomiting (PONV). Comparability of groups was addressed in terms of age, body weight and prognostic features (at analysis all patients were female,
underwent laparoscopic gynaecologic surgery, had a lack of preoperative medical conditions, were of ASA physical status I or II, and had a nitrous oxide anaesthesia with either thiopental or propofol induction anaesthesia).

**Effectiveness results**
The duration of surgery and anaesthesia was longer for the thiopental group than the propofol group. In the former group the duration of surgery was 78.9 +/- 41.9 (mean +/-SD) minutes, and the duration of anaesthesia was 118.1 +/- 46.1 minutes. For the propofol group the duration of surgery was 67.1 +/- 42.8 minutes, and for anaesthesia was 104.9 +/- 44.8 minutes. These were significant differences with a P < 0.05. The recovery room stay was also longer for the thiopental group, although this was not statistically significant.

The side-effects of postoperative nausea and vomiting was similar in both groups. The use of intra-operative fentanyl citrate was, however, more common in the propofol group, (P < 0.01).

**Clinical conclusions**
Patients who received propofol recovered quicker than those who received thiopental anaesthesia. This is indicated by the shorter duration of surgery and anaesthesia.

**Measure of benefits used in the economic analysis**
Duration of surgery and anaesthesia.

**Direct costs**
Costs and quantities were reported separately. Information was collected on: type of induction agent; anaesthesia medication; postoperative medication use; duration of surgery; duration of anaesthesia; recovery room stay. This information was obtained from a computerized database of all outpatient laparoscopic operations performed at the Robert Wood Medical Centre, New Jersey, from 1990-1993. Costs were calculated for: medications; operating room use; anaesthesia; recovery room stay. These were determined using data from the departments of pharmacy and hospital accounting. 1993 prices were used. The boundary adopted was hospital.

**Statistical analysis of costs**
Statistical analysis of costs was performed. Mean, standard deviations and p-values were reported.

**Currency**
US dollars ($).

**Sensitivity analysis**
It was not stated whether sensitivity analysis was undertaken.

**Estimated benefits used in the economic analysis**
The duration of surgery for the propofol group was 12 minutes shorter than the thiopental group, (P = 0.0322). The duration of anaesthesia was 13.2 minutes shorter for the propofol group, (P= 0.0264). The side-effect of PONV was shown not to differ significantly between the two groups.

**Cost results**
The total mean cost for the propofol group was $273 less per patient than the thiopental group, (P = 0.0443). Total cost for the sample as a whole would have been $7900 less if propofol had been used on all patients in the sample.
Synthesis of costs and benefits
Propofol was the dominant strategy.

Authors' conclusions
The authors noted that concurrent use of narcotics and droperidol decreases the perceived cost-benefit of propofol by increasing extubation times and increasing the incidence of PONV. The realized cost savings of using propofol instead of thiopental are, therefore, relatively small on an individual patient basis, but may be more significant on larger patient samples.

CRD Commentary
As the authors themselves recognise, the issue of how much the confounding factors, such as the use of narcotics, affects the duration of recovery and PONV are not addressed sufficiently.

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