Comparison of cost affecting parameters and costs of the "closed" and "open" in situ bypass technique

van Dijk L C, Seerden R, van Urk H, Wittens C H

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
The closed in situ bypass technique.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients undergoing in situ vein bypass.

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

Dates to which data relate
The effectiveness and resource use data were collected during 1992-1994. The resource use associated with the strategies investigated in the study was valued at 1994 prices.

Source of effectiveness data
Effectiveness data were derived from a single study.

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

Study sample
A cohort of 73 patients (49 male) who underwent the closed (35) and the open (38) technique. The average age was 71 years in both groups. Five surgeons performed both techniques. Power calculations to determine the patient sample were not given.

Study design
The study as a randomised controlled trial conducted at two centres. Randomisation was stratified by centre and the surgeons were randomised with the patients. The patients were followed up until hospital discharge. The loss to follow-up was not stated.
Analysis of effectiveness
It was not clearly stated whether the analysis was based on the intention to treat principle or on treatment completers only. The primary health outcomes were the duration of operation, length of postoperative hospital stay and the number (percentage) of patients receiving treatment for residual AV-fistulae. The second of these measures was considered by the authors as reflecting between-group differences in frequency of wound complications.

Effectiveness results
The duration of operation was 210 and 154 minutes ($p<0.05$) in the closed and open group, respectively. The length of hospital stay after operation was 16 and 25 days ($p<0.01$) in the closed and open group, respectively. The number of patients who received treatment for residual AV-fistulae were 14 (closed) and 2 (open) ($p<0.01$).

Clinical conclusions
The study revealed a significantly shorter length of hospital stay for patients after a closed in situ bypass compared to an open in situ bypass. However, the duration of the operative procedure was longer and the number of patients treated for residual AV-fistulae larger.

Measure of benefits used in the economic analysis
The measure of benefits used in the economic analysis was reduced length of postoperative hospital stay. This measure was considered by the authors to be reflective of significant differences in the frequency of wound complications between groups.

Direct costs
Operation and nursing care costs were included in the analysis, as were the costs associated with the treatment of AV-fistulae. The major quantities of resource use were analysed separately from the costs. The quantity/cost boundary adopted was that of the hospital. For the costs of operation and nursing care, the financial data of a subgroup of 26 patients operated on in one of the two centres included in the clinical study were used. Only the costs associated with personnel (including doctor’s fees) and disposable materials were included. As for the treatment of AV-fistulae, these were based on the assumption of an average duration and the costs for disposable materials for the surgical ligation and the postoperative percutaneous coil embolisation procedure. 1994 prices were used to value resource usage.

Statistical analysis of costs
Main quantities of resource use were compared by using Mann-Whitney tests. The authors separately analysed the following cost categories: Duration of operation (medians), duration of postoperative hospital stay (medians) and the duration and unit cost of treatment of AV-fistulae (means).

Currency
US dollars ($). The conversion rate was $1 = 1.70 Dutch Guilders.

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
The postoperative length of hospital stay was estimated to be 16 and 25 days ($p<0.01$) in the closed and open group, respectively.
Cost results
The difference in median operation costs between the two groups was estimated to be $798 per operation in favour of the open technique ($1,419 versus $621). The difference in median postoperative care costs was $2,664 to the advantage of the closed group ($4,736 versus $7,400). The mean costs of treatment of AV-fistulae were lower in the open group by $158 ($9 versus $167).

Synthesis of costs and benefits
A synthesis of the estimated benefits and costs was not given since the authors considered the intervention (the closed approach) to be the dominant strategy.

Authors' conclusions
The closed in situ vein bypass technique is cost-effective in comparison with the open technique.

CRD COMMENTARY - Selection of comparators
The reason for the choice of comparator is clear. The open technique is one of the preferred operating techniques for vascular reconstruction in the lower extremity.

Validity of estimate of measure of benefit
The estimate of measure of benefit used in the economic analysis may be questionable given the measure of the relevant benefits used in the economic study. Although it seems that the postoperative length of hospital stay is clearly associated with reduction in the frequency of wound complications, it still remains to be discussed how to incorporate into the analysis the higher incidence of residual arteriovenous-fistulae observed in the early postoperative period.

Validity of estimate of costs
The main quantities of resource use were analysed separately from the costs. Adequate details of methods of quantity/cost estimation were given. No important cost items were omitted.

Other issues
The authors' conclusions were justified in terms of the results of their statistical test. The issue of generalisability to other settings was not addressed. Appropriate comparisons were made with other studies, showing similar results to those presented in this study. The study could have used a different measure of benefits which combined the contradictory results found for 'postoperative wound complications' and 'AV-fistulae incidence'.

Implications of the study
Further studies may be needed in order to support the authors' conclusions. In particular, the economic study type may need to be changed in order to gain an adequate picture of the relative importance which people assign to the different types of benefits derived from the implementation of the strategies investigated in the study.

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