Transjugular intrahepatic portosystemic shunt versus H-graft portacaval shunt in the management of bleeding varices: a cost-benefit analysis

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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
Transjugular intrahepatic portosystemic shunt (TIPS) and small-diameter prosthetic H-graft portacaval shunt (HGPCS) in the management of haemorrhage due to portal hypertension.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Adults with cirrhosis and bleeding due to portal hypertension.

Setting
Hospital. The economic study was carried out in the United States.

Dates to which data relate
Effectiveness and resource use data were collected between 1993 and 1996. It is not clear what year the prices referred to.

Source of effectiveness data
The evidence for final outcomes was 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
80 adults with cirrhosis and bleeding due to portal hypertension underwent either TIPS (n=40) or placement of an 8mm HGPCS (n=40). Power calculations were not used to determine the sample size.

Study design
This was a randomized controlled trial in a single centre. Patients were randomized to undergo shunting by a computer-generated random numbers table and were randomized in pairs to allow for sequential analysis of pair differences. At the time of the paper the follow-up period was approaching four years. The surgeon determining protocol eligibility for
Analysis of effectiveness
The analysis of the clinical study was based on intention to treat. The primary outcomes used in the analysis were: variceal rehaemorrhage, shunt occlusion, shunt revision, shunt failure, early mortality, and readmission rate. Patients undergoing TIPS and HGPCS were demographically similar, and similar in degree of cirrhosis, cause of cirrhosis and type of varices.

Effectiveness results
After TIPS six patients were admitted a total of seven times for treatment of variceal rehaemorrhage, whereas no patients undergoing HGPCS rebled. Within 30 days of shunting, occlusion requiring intervention or revision occurred in eight patients (20%) after TIPS. For three of these eight patients more than one intervention or revision was necessary. After HGPCS shunt thrombosis was documented on routine postoperative venography in three patients (8%). After TIPS seven patients underwent 11 late revisions due to occlusion or thrombosis. No late HGPCS revisions were necessary. After TIPS 12 patients were readmitted 20 times to have their shunts studied; after HGPCS 9 patients were readmitted for shunt evaluation. Early mortality was similar after each shunt. In total, 12 (30%) patients died after TIPS and nine (23%) died after HGPCS. After TIPS three patients were readmitted three times to treat encephalopathy and after HGPCS seven patients were readmitted 12 times for treatment of encephalopathy. Five TIPS patients required seven readmissions for ascites. One HGPCS patient required one readmission to treat ascites. Cellulitis and abdominal pain necessitated readmission in four patients, two each after TIPS and HGPCS. Two additional readmissions after TIPS were necessitated by a perforated gastric ulcer complicated by intractable ascites and an infected peritoneovenous shunt.

Clinical conclusions
TIPS results in significantly higher readmission rates compared to HGPCS.

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

Direct costs
The cost of care for patients undergoing shunting was determined beginning with placement of the shunt at the index admission. Costs incurred through subsequent admissions and care necessitated by ascites, encephalopathy, rebleeding due to portal hypertension, underlying cirrhosis, routine shunt monitoring, and revisions, when applicable, were recorded. In determining cost of care, hospital and clinic charges were used, as were physician charges. Hospital admissions unrelated to shunt complications or complications unrelated to the underlying cirrhosis or shunting were excluded from the cost analysis. Professional fees included all physician charges during the index hospitalisation beginning with shunt placement and including surgical fees, fees for ICU care, radiologists' fees and anesthesiologists' fees. It is not clear whether costs were discounted.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analyses of costs or benefits were performed.

Estimated benefits used in the economic analysis
Not applicable.
Cost results
The cost of the index admissions after TIPS averaged $48,188 (range: $14,937 to $222,505; standard deviation +/- $43,355) and after HGPCS averaged $61,522 (range: $23,499 to $241,689; SD +/- $47,615). With follow-up, average cost of care with each shunt increased: by $20,720 after TIPS and by $4,512 after H-graft shunts, (p=0.02). To date, the care of patients with TIPS has averaged $69,276 (range: $22,217 to $244,799; SD +/- $52,712) and after HGPCS has averaged $66,034 (range: $23,499 to $255,899; SD +/- $49,118).

Synthesis of costs and benefits
Although appearing to be methodologically necessary, no synthesis was presented.

Authors' conclusions
The early cost of TIPS was less than, though not different from, the cost of HGPCS. With follow-up, costs after TIPS mounted. The initially lower cost of TIPS was offset by higher rates of subsequent occlusion and rehaemorrhage.

CRD COMMENTARY - Selection of comparators
The comparator was chosen as it is commonly used, provides partial portal decompression, and is employed in the same types of patients.

Validity of estimate of measure of benefit
No estimate of the measure of benefit was used in the economic analysis and no synthesis of costs and benefits was performed. The effectiveness results in the clinical study were based on relatively small sample sizes which had not been determined by a power calculation.

Validity of estimate of costs
Resource quantities were reported separately from prices and adequate details of the cost/quantity estimates were given.

Other issues
The authors' conclusions were justified given the uncertainties in the data. The issue of generalisability to other settings or countries was addressed.

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