Diagnostic ascertainment of suspicious pancreatic mass: a threshold 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.

CRD summary
The objective was to assess the factors affecting the cost-effectiveness of performing pancreaticoduodenectomy surgery versus expectant management in patients with a suspicious pancreatic head mass. The authors concluded that, even if diagnostic certainty was not possible, it was often beneficial to perform surgery despite the risk of an unnecessary pancreaticoduodenectomy. The analysis had some methodological limitations and was not extensively reported. Caution is required when assessing the validity of the authors' conclusions.

Type of economic evaluation
Cost-utility analysis

Study objective
The aim was to assess the factors affecting the cost-effectiveness of performing surgery (pancreaticoduodenectomy) versus expectant management in patients with a suspicious pancreatic head mass.

Interventions
Pancreaticoduodenectomy (Whipple procedure) was compared against a strategy of expectant management.

Location/setting
USA/hospital.

Methods
Analytical approach:
The analysis was based on a decision analytic model with a lifetime horizon. The authors did not state the perspective adopted.

Effectiveness data:
The clinical data came from a few known, relevant sources. Life expectancy for patients undergoing or not undergoing surgery was based on the Surveillance Epidemiology and End Results (SEER) database. The key input was the probability of survival after a Whipple procedure. No more information on the data sources was provided.

Monetary benefit and utility valuations:
The utility values were derived from published data of postsurgical surveys among patients after pancreaticoduodenectomy.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure.

Cost data:
The economic analysis included only the cost of pancreaticoduodenectomy, which was derived from previous studies that used Medicare reimbursement data, including the professional fees for pancreaticoduodenectomy with or without complications. All costs were in US dollars ($) and the price year was not reported.

Analysis of uncertainty:
The model assumptions were varied in a deterministic threshold analysis in which arbitrary ranges of values were considered.
Results
The authors did not report the expected costs, benefits, and cost-utility ratios for the two strategies. Instead, the threshold value was calculated and was defined as the probability of pancreatic cancer at which pancreaticoduodenectomy was cost-effective or the incremental cost per QALY gained was below the commonly quoted threshold of $50,000.

In the base case, the threshold probability of cancer was 43% and any probability above this meant that pancreaticoduodenectomy was the preferred option.

Higher costs of the surgical procedures and lower quality of life after surgery reduced the cost-effectiveness of pancreaticoduodenectomy, which meant the probability threshold was higher and ranged from 40% to 65%. In older patients, the threshold was lower due to their shorter life expectancy.

In a scenario with advanced pancreatic lesions suspicious for regional spread, the threshold probability rose to 86%.

Authors’ conclusions
The authors concluded that, even if diagnostic certainty was not possible, it was often beneficial to perform surgery despite the risk of an unnecessary pancreaticoduodenectomy.

CRD commentary
Interventions:
The selection of the comparators appears to have been valid given that expectant management was the usual alternative to the more aggressive Whipple surgery.

Effectiveness/benefits:
The clinical evidence was mainly derived from an administrative database, which has the advantage of being representative and a relatively large source of data. Administrative sources, however, usually do not permit a comprehensive analysis of the clinical data and may not be directly useful for the purpose of the analysis. Another potential weakness is the retrospective nature of such databases, which are widely used in the US setting. In general, the sources were not described, which reduces the possibility of objectively assessing the validity of the clinical data. Limited details of the derivation of the utility values were given. QALYs are an appropriate benefit measure, given the strong impact of the interventions on both quality of life and survival. Discounting was not reported and it may have been relevant.

Costs:
The analysis of costs appears to have included only the cost of surgery, which was assumed to be the only difference between the two comparators. This cost was derived from previous studies and the methodological details of these were not reported. It was presented as a macro-category without any breakdown of individual items. The authors stated that Medicare rates were used in the published studies, which suggests the adoption of a third-party payer’s perspective. Other details of the economic analysis, such as the price year and discounting when relevant, were not reported.

Analysis and results:
The analytical approach used to synthesise the costs and benefits was consistent with the objective, but led to limited reporting of the findings. The aim was to identify the factors affecting the decision to perform surgery or not. The sensitivity analysis was also consistent with this objective and focused only on variations in specific model inputs. In general, few details of the methods and results of the study were provided.

Concluding remarks:
The analysis had some methodological limitations and was not extensively reported. Caution is required when assessing the validity of the authors’ conclusions.

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