

Gallstones: Wait and see or treat?

Key Findings

- Cholecystectomy (surgical treatment) of gallstones is more costly to the NHS because of the use of resources associated with surgery and the costs related to the treatment of post-surgery complications.
- Conservative management is, on average, less costly but also less clinically effective for the treatment of symptomatic gallstones.
- A policy of surgery for all, rather than a policy of conservative management followed by surgery among people whose symptoms persist, is likely to be more effective and more costly.

What problem was this research addressing?

Gallstone disease, cholelithiasis, is the most common and costly gastrointestinal disorder in industrialised countries. Prevalence increases with age and obesity and is higher in women than in men. In about 20% of people, the condition is symptomatic and can cause severe pain and complications which require medical attention and/or emergency surgery. Cholecystectomy, the surgical removal of the gallbladder, is the usual treatment for people who present with biliary pain or acute cholecystitis and evidence of gallstones. However, half of those with an initial episode of biliary pain or cholecystitis do not experience further episodes of pain in the future. There is, therefore, a suggestion that uncomplicated symptomatic gallstone disease (biliary pain or cholecystitis) does not always require removal of the gallbladder and could be treated conservatively (e.g. with medicines and/or dietary changes).

What this research adds

This assessment was designed to help inform decisions regarding the use of conservative management and cholecystectomy for adults with uncomplicated symptoms or cholecystitis. In particular, this assessment aimed to:

- Perform a systematic review of the evidence available on the cost-effectiveness of cholecystectomy compared with conservative management.
- Determine which treatment option is most likely to be cost-effective for implementation in the UK NHS.
- Identify and prioritise future research needs.

Methods

A new economic model was developed to compare alternative treatment strategies for people with symptomatic gallstone disease (biliary pain or cholecystitis). Two strategies were considered:

- Conservative management.
- Surgical management (cholecystectomy).

Parameter estimates were derived from a systematic review of clinical effectiveness, an expert advisory group and other UK sources. The outputs of the model were incremental costs and Quality Adjusted Life Years (QALYs) and incremental cost per QALY for a 5-year time horizon. Costs were considered from a health services perspective. Costs were discounted at 3.5% per year in accordance with current National Institute for Health and Care Excellence guidelines. Probabilistic and deterministic sensitivity analyses were applied to the model in order to assess the robustness of the results to realistic variations in the model parameters.

Research Findings

The results of the economic evaluation (Table 1) showed that, on average, the surgery strategy cost £1236 more than the conservative management strategy but was, on average, more effective and generated 0.094 additional QALYs. The incremental cost per QALY was £13,205. The result of the incremental cost-effectiveness analysis indicated that surgery had a 49% chance of being considered cost-effective when society's willingness to pay for a QALY was £20,000 and a 54% chance when willingness to pay was £30,000. The probability of cost-effectiveness was not sensitive to changes in the threshold, when the threshold increased to £50,000, the surgery strategy had a 58% chance of being considered cost-effective.

The results were sensitive to the probability of people in conservative management undergoing future cholecystectomy. An increase in the number of people requiring surgery at a later date after initial conservative treatment led to a reduction in the cost-effectiveness of the conservative strategy. On average, the cost of the conservative management strategy was reduced to £694 when the probability of

undergoing surgery was reduced to 25%, leading to an incremental cost-effectiveness ratio (ICER) of £33,542 per QALY for the surgical strategy. In contrast, the cost of the conservative management strategy increased to £1757, leading to a reduced ICER of £4291 when the probability of surgery among people initially managed conservatively was increased to 75%.

Discussion

Cholecystectomy is more costly to the NHS because of the use of resources associated with surgery and the costs related to the treatment of post-surgery complications. Our modelling shows that conservative management is, on average, less costly but also less clinically effective for the treatment of symptomatic gallstones. A policy of surgery for all, rather than a policy of conservative management followed by surgery among people whose symptoms persist, is likely to be more effective even though more costly. The difference between the two policies, however, is small. Uncertainty in the economic model was mostly driven by the pre- and post-surgery utility values, as well as by the future probability of receiving surgery following a strategy of conservative management.

The economic model focused on costs to the NHS. However, there are no data on the number of pain relief medications that people may procure to take care of their symptoms. There is a need for a prospective follow-up of people who do not have surgery to have further insight regarding their health-seeking behaviour, particularly the number of times they visit their GP and other health-care providers for the management of uncomplicated symptomatic gallstone disease (biliary pain or cholecystitis).

TABLE 1 Base-case analysis

Strategy	Costs (£)	Incremental cost	QALY's	Incremental QALYs	ICER (£)
CM*	1104		4.139		
Surgery	2340	1236	4.232	0.094	13,205
Probability cost-effective for different threshold values for society's willingness to pay for a QALY (£)					
Threshold Value	10,000	20,000	30,000	40,000	50,000
CM*	60%	51%	46%	44%	42%
Surgery	40%	49%	54%	56%	58%
Probability of people needing surgery after conservative management reduced to 25%					
CM*	694	–	4.182	–	–
Surgery	2340	1646	4.222	0.049	33,542
Probability cost-effective for different threshold values for society's willingness to pay for a QALY (£)					
Threshold Value	10,000	20,000	30,000	40,000	50,000
CM*	75%	61%	56%	51%	48%
Surgery	25%	39%	44%	49%	52%
Probability of people needing surgery after conservative management increased to 75%					
CM*	1757	–	4.095	–	–
Surgery	2340	583	4.231	0.136	4291
Probability cost-effective for different threshold values for society's willingness to pay for a QALY (£)					
Threshold Value	10,000	20,000	30,000	40,000	50,000
CM*	52%	49%	47%	46%	46%
Surgery	48%	51%	53%	54%	54%

CM* = Cholecystectomy

Research and policy implications

A large, well-designed clinical trial needs to be undertaken to compare the effects and safety of observation/conservative management with cholecystectomy in people presenting with uncomplicated symptomatic gallstones (biliary pain) or cholecystitis to secondary care. Ideally, such a trial would include relevant outcome measures, such as post-cholecystectomy symptoms and quality-of-life measurements, and a full economic evaluation. This trial would subsequently help clinicians to prioritise surgery for people who stand to benefit the most.

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For further information see:

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