Cost-effectiveness of exercise therapy after corticosteroid injection for moderate to severe shoulder pain due to subacromial impingement syndrome: a trial-based analysis
Jowett S, Crawshaw DP, Helliwell PS, Hensor EM, Hay EM, Conaghan PG

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
This study evaluated the costs and effects of corticosteroid injection, combined with exercise and manual therapy, for moderate-to-severe shoulder pain, due to subacromial impingement syndrome. The authors concluded that injection by a physiotherapist, with exercise therapy, might be cost-effective for these patients, compared with exercise therapy alone. Some methods were not reported, but overall the analysis was well conducted, and the authors’ conclusions appear to be appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
This study evaluated the costs and effects of corticosteroid injection, combined with exercise and manual therapy, for moderate-to-severe shoulder pain, due to subacromial impingement syndrome.

Interventions
The intervention was exercise therapy and advice, after subacromial corticosteroid injection. The comparator was exercise and advice alone. The corticosteroid injection included triamcinolone acetonide and lidocaine, and was given by a physiotherapist.

Location/setting
UK/primary care.

Methods
Analytical approach:
This cost-effectiveness analysis was conducted alongside a randomised controlled trial of 232 people. The time horizon was 24 weeks, which was the last point at which the EQ-5D questionnaire was administered. The authors stated that they adopted a UK health sector perspective.

Effectiveness data:
The primary outcome of the trial was the Shoulder Pain and Disability Index (SPADI) score at 12 weeks, but for the economic analysis, the outcome of interest was quality of life, from the EQ-5D questionnaires. These questionnaires were completed at the start, and at one, six, 12 and 24 weeks. Full trial methods and outcomes were reported elsewhere (see Other Publications of Related Interest). There were 232 participants recruited, with 115 randomised to injection plus exercise, and 117 randomised to exercise only. Outcomes were assessed according to the intention-to-treat principle. Complete EQ-5D data were available for 69.4% of patients.

Monetary benefit and utility valuations:
The three-level EQ-5D questionnaire responses, from patients in the trial, for each time point, were converted into utility values, using a UK general population survey. Total quality-adjusted life-years (QALYs) were estimated for each patient, over 24 weeks, by calculating the area under the curve, derived from the utility values at each point. These QALYs were adjusted for initial utility scores, to avoid bias.

Measure of benefit:
The measure of benefit was the estimated QALY difference between the trial groups.

Cost data:
The cost data were obtained alongside the trial, and included the cost of the intervention and the resources used for shoulder-related pain. The costs were evaluated using the intention to treat principle. For the intervention, only the subacromial corticosteroid injection costs were analysed, since exercise therapy was given in both groups. Health care resources were assessed by a postal questionnaire, completed by trial participants, at 24 weeks. Resources included primary care visits, prescribed medicines, hospital appointments, hospital investigations (including X-rays and ultrasound scans), and treatments and visits to other health professionals. The unit costs were from reviewed, national, published sources. All costs were reported in 2009 to 2010 UK £.

Analysis of uncertainty:
To account for uncertainty in the cost-effectiveness estimates, non-parametric bootstrapping was applied to the patient-level data. The results were presented on a cost-effectiveness plane, and in cost-effectiveness acceptability curves of the probability that an intervention was cost-effective at different cost-effectiveness thresholds. A broader, societal perspective was considered, including the costs of private health care; over-the-counter medicines, treatments or appliances; and time off work.

Results
After adjustment, there was a total QALY gain of 0.001 with the injection plus exercise, compared with exercise alone. The bootstrapped 95% confidence interval, for the unadjusted result (QALY gain -0.0004) was -0.0212 to 0.0216.

The total difference in the NHS costs of injection plus exercise, compared with exercise alone, was £42.29 (95% CI -129.50 to 37.20). Including non-NHS costs, this was £57.23 (95% CI -159.77 to 23.50). The mean cost of shoulder problem-related work absence was £53.31 (SD 218.15) for injection plus exercise, and £102.79 (SD 297.85) for exercise alone.

Injection plus exercise dominated exercise alone, as injection plus exercise was slightly less costly and more effective. At a threshold of £20,000 per QALY gained, injection plus exercise was the most cost-effective alternative in 61% of simulations.

Authors' conclusions
The authors concluded that physiotherapy-led injection for shoulder pain, with exercise therapy, might be cost-effective for patients with shoulder problems, compared with exercise therapy alone, with lower health care costs and less time off work.

CRD commentary
Interventions:
Limited details of the interventions were provided, but a reference was given for the clinical trial. Alternative interventions were not discussed.

Effectiveness/benefits:
Few details of the clinical trial were reported, as it was described elsewhere. It is therefore not possible to comment on the trial methods. The health outcomes appear to have been appropriately captured by the EQ-5D utilities, but it was not clear what the long-term outcomes, after 24 weeks, might be. If the long-term health benefits of the two interventions were expected to be different, then a short-term analysis is unlikely to adequately assess the cost-effectiveness of the intervention. The method used to analyse the QALY outcomes appears to have been appropriate.

Costs:
The costing methods were well described and reported, except for the unit costs, which were not reported. The results were generally well reported. A postal questionnaire was given at 24 weeks, but it was not clear if participants were asked to record resource use prospectively in a diary. If not, there may have been recall errors. The authors noted that data were missing for health care use.

Analysis and results:
An incremental analysis was conducted, which was the most appropriate form of analysis for assessing cost-effectiveness. The statistical analysis of the results appears to have been appropriate, and uncertainty in the results was adequately addressed. The results were mostly well reported. The authors discussed the limitations of their analysis, including the short time horizon and missing data on health care use.

Concluding remarks:
Some methods were not reported, but overall the analysis was well conducted. The authors' conclusions appear to be appropriate.

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