A cost consequences analysis of local corticosteroid injection and physiotherapy for the treatment of new episodes of unilateral shoulder pain in primary care

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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
The study examined corticosteroid injections into the sub-acromial space for the treatment of unilateral shoulder pain. The corticosteroid injection, which comprised methylprednisolone mixed with lidocaine (lignocaine), was administered by a general practitioner (GP). The comparator was physiotherapy. This consisted of up to eight 20-minute sessions over a 6-week period and was provided by an experienced musculoskeletal community physiotherapist.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients who consulted their GP with new episodes of unilateral shoulder pain. To be included in the study, the patients had to be aged 18 years or older.

Setting
The setting was the community and primary care. The economic study was carried out in Staffordshire, UK.

Dates to which data relate
The effectiveness data were collected between June 1998 and March 2000, with resource use measured over the same period. Prices were reported for the years 2002 to 2003.

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

Link between effectiveness and cost data
The costing was carried out prospectively for the same sample of patients as that used in the effectiveness study.

Study sample
The authors reported that the detailed study protocol and study outcomes were published elsewhere (Hay et al. 2003, see Other Publications of Related Interest- below for bibliographic details). The authors did not state in the current report that power calculations had been carried out to estimate the impact of chance on the results. The sample was selected by including all those eligible patients that presented during the dates of the study. A total of 237 patients were registered, of which 103 were randomised to receive physiotherapy (49% female) and 103 (58% female) to receive...
injection. The mean age of the patients was 57 years in the physiotherapy group and 58 years in the injection group. Eight sets of notes were excluded from the analysis, two from the physiotherapy group and six from the injection group. Such exclusions were because of patients moving (4), patients denying consent (2), death (1) and missing records (1).

Study design
The authors designed a pragmatic randomised controlled trial, and the patients were randomised and treated accordingly. However, after the 6-week assessment, GPs were permitted to prescribe other treatments if clinically indicated. The study was based at nine general practices in North Staffordshire. The patients were followed until 6 months post randomisation, at which point they were assessed by a blinded study nurse.

Analysis of effectiveness
The patients were analysed according to intention to treat. The primary outcome was shoulder disability at 6 months, measured using a shoulder disability questionnaire (Croft 1994, see ,Other Publications of Related Interest- below for bibliographic details). The authors did not report summary statistics for the two sample groups and did not discuss the presence or absence of confounding factors. These might have been discussed in the article by Hay et al (2003).

Effectiveness results
The mean disability score at baseline was 10.85 (standard deviation, SD=4.4) for the physiotherapy group and 10.96 (SD=4.7) for the injection group.

The mean disability score at 6 months was 4.85 (SD=4.9) for the physiotherapy group and 6.40 (SD=6.2) for the injection group.

The global assessment of percentage change was also presented in the paper.

Clinical conclusions
The authors concluded that there were similar outcomes in the two patient groups.

Measure of benefits used in the economic analysis
The secondary outcomes were EQ5D (EuroQol Group Business Management), the participant's global assessment of change, pain severity, and the impairment of function and severity of 'main complaint' (Beurskens et al. 1995, see ,Other Publications of Related Interest- below for bibliographic details); these measures were the authors' summary measures of health benefit. The authors reported that the measures were designed to capture different dimensions of health-related quality of life. The authors did not state whether each of these measures was validated for the study population.

Direct costs
The costing analysis was carried out from the perspective of the health service. The analysis focused on resource input required in terms of capital, staff, and consumables and usage, measured from entry into the study until 6-months post-randomisation. The authors also observed cointerventions (manipulation under anaesthetic, outpatient referrals for orthopaedic or rheumatology appointments, X-rays, or additional visits to the GP associated with shoulder pain) and were able to take the costs of these into consideration. The unit costs were valued using a combination of local and national data, including published studies, official reports and hospital data. The average cost per event was reported separately, as were resource use per patient and the average costs per patient. The costs were presented in 2002 to 2003 prices and were reflation where necessary, although the authors did not state how this was done (e.g. using the Consumer Price Index). Discounting was not required because of the short time horizon of the study.
Statistical analysis of costs
The authors reported the average costs, and used bootstrapping with 1,000 independent samples to estimate confidence intervals.

Indirect Costs
The indirect costs were not estimated as they were not relevant to the perspective adopted. In their discussion, the authors discussed the implications of including these costs into the analysis.

Currency
UK pounds sterling (€).

Sensitivity analysis
The authors used sensitivity analyses to test whether changes in key variables would alter the base-case results. GP caseload and the minor surgical fee were subjected to a sensitivity analysis where the initial estimates were based on assumptions. The ranges for GP caseload were determined by the natural limits imposed by GP contracts.

Estimated benefits used in the economic analysis
The mean EQ5-D score at baseline was 0.54 for the physiotherapy group and 0.56 for the injection group. The mean EQ5-D score at 6 months was 0.75 for the physiotherapy group and 0.72 for the injection group.

Cost results
The mean intervention costs were 80.09 (Range: 0 to 202) for physiotherapy and 25.88 (Range: 0 to 61) for injection. The mean follow-up costs were 34.51 (Range: 0 to 410) for physiotherapy and 45.40 (Range: 0 to 917) for injection. The mean total costs were 114.60 (Range: 0 to 423) for physiotherapy and 71.28 (Range: 0 to 943) for injection. The difference in the mean average costs was 43.32 (95% bootstrap confidence interval: 14.36 to 66.38), giving a statistically significant difference.

Synthesis of costs and benefits
The estimates were not combined, therefore the study was categorised as a cost-consequences analysis.

Authors’ conclusions
The results showed a statistically significant difference in treatment cost in favour of injections, and similar outcomes in the two treatment groups.

CRD COMMENTARY - Selection of comparators
The authors compared injection with physiotherapy. They justified these comparators in terms of the published evidence demonstrating the similarity in their clinical benefits.

Validity of estimate of measure of effectiveness
The authors carried out a randomised controlled trial with blinding of the reviewer. This design helps to minimise systematic differences between the two patient groups and ensure that differences in outcome are due to the technologies of interest, rather than differences between the patients in the two groups. The authors did not provide
summary statistics for patients in this report, so it was not clear whether there remained any potential confounding factors after randomisation. This information might have been reported elsewhere. In order to fully establish the internal validity of the study, the reader will need to refer to the parent clinical study (Hey et al. 2003).

**Validity of estimate of measure of benefit**
The authors used several summary measures of health benefit based on published studies, the results of which were tabulated in brief. Although the authors stated that more detailed reports could be gained elsewhere, a better summary of the health benefits available would have given the reader a greater understanding and thus enable them to decide whether they wanted to look at the appropriate reference for more details. The study sample was representative of the study population as it included patients presenting with unilateral shoulder pain.

**Validity of estimate of costs**
The costing was carried out from the perspective of the health service, and costs appropriate to this perspective were included. The authors focused their analysis on the costs of GP and physiotherapy visits, injections and co-interventions. They reported the unit costs independently from the resources used and reported the results thoroughly. The results indicated a statistically significant difference between the total costs of the two interventions, suggesting that small omissions in cost may not influence the overall conclusions. However, although statistically different, the total costs were numerically very similar. Therefore, the authors may find that they obtain different results and conclusions when translating the results to alternative settings and populations.

**Other issues**
The authors drew comparisons between their own findings and those of a similar study set in secondary care. Whilst there were similarities in both the cost and outcome results, the authors raised caution in making comparisons because of reporting issues with the previous study. The issues of generalisability were discussed, with the authors suggesting that readers might input their own local cost figures to apply the results to their own setting. The authors also considered the impact of adopting different perspectives for the analysis. The cost results were presented very thoroughly. Some limitations were highlighted and these focused on the economic analysis not taking patient treatment practices into account.

**Implications of the study**
The authors highlighted that the similarity in outcomes and difference in costs are of primary importance for a health care decision-maker. They suggested further work exploring the implications of who exactly administers corticosteroid injections.

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**Other publications of related interest**


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