Can early diagnosis and management of costochondritis reduce acute chest pain admissions

Freeston J, Karim Z, Lindsay K, Gough A

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
Early rheumatology referral for patients suffering from costochondritis and presenting with acute chest pain was examined.

Type of intervention
Diagnosis and treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients presenting with acute chest pain.

Setting
The setting was a hospital. The economic study was carried out in the UK.

Dates to which data relate
The period during which the effectiveness and resource use data were gathered was not reported. The price year was 2003.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

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

Study sample
Power calculations were not reported. The patients' charts of all eligible patients were identified at the authors' institution over a 5-year timeframe. The diagnosis of costochondritis was confirmed clinically in all cases after a full history and examination by one of the authors. A sample of 25 patients was identified. There were 17 women and the mean age of the sample was 49.5 years (range: 26 - 75). All patients had normal cardiac enzyme and chest radiographs at first presentation.

Study design
This was a retrospective within-group comparison study, where a single group of patients was retrospectively
evaluated before and after the Rheumatology Department review. Twenty-three of the 25 patients had an outpatient follow-up, which ranged from 6 months to 6 years. Two patients with primary costochondritis were discharged.

**Analysis of effectiveness**
The analysis of effectiveness considered all patients included in the initial study sample. The primary outcome measure used was the number of chest pain admissions. Other outcomes were time to diagnosis, number of tender joints, minor and major investigations, and inpatient days. Drug usage was also examined and improvements in pain were reported.

**Effectiveness results**
The number of chest pain admissions was 39 (range per patient: 1 - 16) before the review and 6 (range per patient: 0 - 3) after the review, (p<0.0001).

The mean number of chest pain admissions was 3.5 (+/- 4.8) before the review and 0.5 (+/- 1.1) after the review, (p<0.0001).

The average time to diagnosis was 9.4 months, ranging from immediate diagnosis to 57 months.

The mean number of tender joints was 3.4 (range: 1 - 8).

The number of minor investigations was 169 before the review and 17 after the review, (p<0.01).

The number of major investigations was 30 before the review and 0 after the review, (p<0.01).

The number of inpatient days was 137 before the review and 5 after the review, (p<0.01).

The use of non-steroidal anti-inflammatory drugs increased after the review (13 patients before the review and an additional 9 after the review).

All patients (13) who had received perichondral steroid injections (20 mg methylprednisolone acetate with 1 mL 2% lignocaine) reported symptomatic improvements.

Eleven patients started SSZ and all but one responded to therapy.

All 10 patients continued SSZ (range: 0.5 - 6 years), but one patient was changed to methotrexate because of a lack of efficacy.

**Clinical conclusions**
The effectiveness analysis showed that the Rheumatology Department review led to reductions in chest pain admissions, investigations, and inpatient days. In general, steroid injections and SSZ were effective treatment strategies.

**Measure of benefits used in the economic analysis**
The health outcomes were left disaggregated and no summary benefit measure was used in the economic analysis. In effect, a cost-consequences analysis was performed.

**Direct costs**
Discounting was not relevant since the costs were incurred during a short timeframe. The unit costs were presented separately from the quantities of resources used. The health services included in the economic evaluation were creatine kinase MB isoenzyme, electrocardiogram, chest radiograph, transthoracic echocardiogram, oesophago-gastroduodenoscopy, on-side angiograms, and inpatient stay. The cost/resource boundary of the hospital appears to
have been adopted. Resource use was derived from patient-level data obtained from the sample of patients included in the effectiveness study. The costs were obtained from the hospital department. The price year was 2003.

**Statistical analysis of costs**
The costs were treated deterministically.

**Indirect Costs**
The indirect costs were not included in the economic evaluation.

**Currency**
UK pounds sterling (€).

**Sensitivity analysis**
Sensitivity analyses were not performed.

**Estimated benefits used in the economic analysis**
See the 'Effectiveness Results' section.

**Cost results**
The total costs in the whole sample of patients were 54,122 before the review and 2,002.5 after the review. The vast majority of costs were due to inpatient stays (41,100 before the review and 1,500 after the review).

**Synthesis of costs and benefits**
A synthesis of the costs and benefits was not relevant since a cost-consequences analysis was, in effect, performed.

**Authors' conclusions**
Costochondritis should be considered when treating patients presenting with acute chest pain, particularly if the symptoms are recurrent. Referral to a consultant rheumatologist led to reductions in admissions and investigations, resulting in substantial cost-savings. Improvements in pain treatments were also observed.

**CRD COMMENTARY - Selection of comparators**
The selection of the comparator was appropriate because pre- and post-review diagnosis and treatment patterns were compared. The provision of more details of the intervention under evaluation would have been helpful. You should decide if they are valid comparators in your own setting.

**Validity of estimate of measure of effectiveness**
The analysis of effectiveness was based on data derived from a single group of patients who were evaluated before and after the intervention was implemented. As the authors stated, the use of an external and simultaneous control group would have been more appropriate. In fact, the two groups were presumably evaluated in two different timeframes, which further reduces the reliability of the comparison because factors other than the study intervention could have contributed to the different outcomes. The authors did not investigate the possible impact of bias and confounding factors that could have affected the results of the analysis. The patients were recruited from a single centre, and it was unclear whether the study sample was representative of the patient population. There was no evidence that the sample size was appropriate. These issues tend to limit the internal validity of the analysis.
Validity of estimate of measure of benefit
No summary benefit measure was used in the analysis because, in effect, a cost-consequences analysis was conducted.

Validity of estimate of costs
The perspective of the hospital appears to have been adopted in the study, as only hospital costs were included in the economic evaluation. The resource use data and the unit costs were presented separately, which enables the findings of the current analysis to be replicated. The costs were obtained from the hospital department and the price year was reported, which aids reflation exercises in other settings. However, the cost estimates were specific to the study setting and no sensitivity analyses were performed. Similarly, the costs were treated deterministically.

Other issues
The authors did not compare their findings with those from other studies. They also did not address the issue of the generalisability of the study results to other settings. Sensitivity analyses were not carried out and all the estimates were specific to the study setting. Therefore, caution is required when extrapolating the results of the analysis. The authors noted some limitations of their study. For example, the retrospective design, the lack of a control group, single clinical assessor, and potential bias.

Implications of the study
The authors pointed out that future studies based on a prospective and robust design, and with longer follow-up, should be carried out to corroborate the findings of the current study.

Source of funding
None stated.

Bibliographic details

PubMedID
15517642

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; Aged; Anti-Inflammatory Agents, Non-Steroidal /therapeutic use; Chest Pain /etiology; Female; Health Care Costs; Hospitalization /economics /statistics & numerical data; Humans; Male; Middle Aged; Retrospective Studies; Rheumatology /economics /methods; Sulfasalazine /therapeutic use; Tietze's Syndrome /complications /diagnosis /drug therapy; Time Factors

AccessionNumber
22004001501

Date bibliographic record published
30/04/2005