Can Early Diagnosis and Management of Costochondritis Reduce Acute Chest Pain Admissions?

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ABSTRACT. ***Objective.*** We identified patients presenting with chest pain diagnosed as costochondritis by a consultant rheumatologist. The time taken to diagnosis was determined and the influence of diagnosis on subsequent management was assessed. We then estimated any cost benefits that early diagnosis and treatment of costochondritis might confer. Finally, we evaluated our current experience of sulfasalazine as a treatment for recurrent costochondritis.

Methods. This was a retrospective observational study of 25 consecutive patients (17 female), mean age 50 years (range 26–75), with costochondritis who initially presented with acute chest pain.

Results. The mean time to diagnosis was 9.4 (0–57) months. The total number of chest pain admissions pre-review was 39 compared with 6 post-review ($p < 0.0001$). The number of minor investigations was 169 pre-review compared with 17 post-review ($p < 0.0001$), and major investigations 30 compared with 0 ($p < 0.01$). All 13 patients treated with corticosteroid injections reported symptomatic improvement, and 10 of the 11 whose symptoms recurred responded to sulfasalazine.

Conclusion. Patients with costochondritis frequently present with acute chest pain, often resulting in multiple admissions and investigations. In this study admission and investigation rates were significantly reduced following rheumatological review. How much of this reduction is directly a result of rheumatological intervention is unclear, given the limitations of the study. The findings suggest early review may improve patient care and reduce expenditure; in recurrent cases of costochondritis, sulfasalazine may be of additional longterm benefit. (J Rheumatol 2004;31:2269–71)

Key Indexing Terms:
COSTOCHONDRITIS CHEST PAIN

Acute central chest pain remains one of the most frequent emergency medical hospital admissions, representing 20–30% of cases[1]. Noncardiac chest pain also represents 50–60% of cardiology outpatient workload, with general practitioners correctly diagnosing one in 5 cases[2]. While in the majority of cases musculoskeletal chest pain is self-limiting, a significant proportion of patients have continuing symptoms requiring multiple admissions[3-5].

Costochondritis is a common cause of musculoskeletal chest pain[6] and is well recognized in association with the seronegative spondyloarthropathies (SpA). It frequently affects several costochondral joints, causes no swelling, and is often chronic, clearly contrasting with Tietze's syndrome, where the presentation is acute and there is associated swelling of the affected joint. In some cases of costochondritis, however, the chest pain can be acute and severe, and, if recurrent, may lead to serial presentations to acute medical services. The recognition that dual pathology occurs, however, leads many clinicians to investigate such patients for cardiac pathology anyway, particularly in the presence of known risk factors[7,8].

Both sulfasalazine (SSZ)[9] and corticosteroid injections have been used with proven benefit in seronegative SpA, but despite an extensive review of the literature, there are only anecdotal reports on the use of local anesthetic-corticosteroid injections in costochondritis[3,6,10-12], and no reports to our knowledge on the use of SSZ. We review all cases of costochondritis initially presenting with acute chest pain that were referred to our department over a 5-year period. Our primary objective was to assess whether early rheumatology referral might reduce investigations and admissions.

MATERIALS AND METHODS

We identified 25 patients with costochondritis presenting with acute chest pain from hospital computer records, following referral from their general practitioner or hospital consultant. The diagnosis of costochondritis was confirmed clinically in all cases after a full history and examination by the Consultant (AG). The examination identified tenderness over varying numbers of costochondral articulations that reproduced their symptoms. There was no control group to assess tenderness in asymptomatic individuals.

We recorded demographic details such as age and sex, time to diagnosis from first presentation, and the number of tender costochondral joints on examination. The primary outcome measure was the number of chest pain admissions pre- and post-review. Other outcome measures pre- and post-review included duration of inpatient stay, number of tender joints, investigations (see Appendix), and treatment interventions. An inpatient admission was defined as anyone admitted to a hospital bed where an overnight stay

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Submitted July 2, 2003; revision accepted May 10, 2004.

equals one day and 0.5 equals admission without overnight stay. Other details such as time to diagnosis and symptomatic improvement following perichondral corticosteroid injection and SSZ were recorded.

Costings for these investigations were obtained from the local hospital finance department. The data obtained for each outcome measure before and after review were analyzed using the Wilcoxon signed-rank test for nonparametric data (data skewed by 3 patients who had several admissions with recurrent pain). Twenty-three of the 25 had outpatient followup ranging from 6 months to 6 years; 2 with primary costochondritis were discharged.

RESULTS

Seventeen of the 25 patients were female (68%) with a mean age of 49.5 years (range 26–75). All 25 patients had normal cardiac enzymes and chest radiographs at first presentation. Nine patients (36%) had costochondritis secondary to conditions such as psoriasis (3), ulcerative colitis (1), rheumatoid arthritis (1), and undifferentiated polyarthritis (4) at first presentation. Costochondritis was the presenting feature of the underlying diagnosis in 2 of these cases. 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 (1–8). Comparisons of different outcome measures before and after Rheumatology Department review are summarized in Table 1. Costs are quantified pre- and post-review in Table 2.

Thirteen (52%) patients had started taking nonsteroidal antiinflammatory drugs prior to rheumatology review, with an additional 9 patients started post-review. Thirteen patients (52%) had a total of 102 perichondral steroid injections, each consisting of 20 mg methylprednisolone acetate with 1 ml 2% lignocaine. All 13 who had injections reported symptomatic improvement, both at the time of the procedure due to local anesthetic effect, and at the followup outpatient appointment.

Eleven (44%) patients, 7 with primary and 4 with secondary costochondritis, started SSZ, with all responding except one with secondary disease. The indications were peripheral arthritis (2) or recurrence after injection (9), although some patients continued to have steroid injections after starting SSZ. Ten out of 11 patients (91%) have continued SSZ (0.5–6 yrs' duration), but one patient was changed to methotrexate due to lack of efficacy.

Table 1. Comparison of different outcome measures before and after Rheumatology Department review.

Outcome Measure	Before Review	After Review	p
Chest pain admissions (range per patient)	39 (1–16)	6 (0–3)	< 0.0001
Mean no. of chest pain admissions	3.5 ± 4.8	0.5 ± 1.1	
Minor investigations	169	17	< 0.0001
Major investigations	30	0	< 0.01
Inpatient days	137	5	< 0.01

DISCUSSION

This study emphasizes the need for doctors to consider costochondritis in patients presenting with acute chest pain, particularly if the symptoms are recurrent. In our study more than a third of patients had other conditions, such as psoriasis, that are associated with costochondritis, suggesting perhaps the failure of examining doctors to recognize the condition. Reassurance and starting an effective treatment regimen is vital, although great care should be taken when withdrawing cardiac medication where the possibility of dual pathology exists.

The immediate response to injection (local anesthetic effect) in all patients was reassuring, in that it confirmed the diagnosis, although the high recurrence rate (82%) emphasized the chronicity of the condition. The prolonged benefit with SSZ, consistent with its successful use in seronegative SpA[9], suggests it is reasonable to extend its use to those patients where injections were effective but symptoms recurred. This is the only study to show both benefit from corticosteroid injections and SSZ in the treatment of costochondritis. We also show a reduction in further admissions and investigations following diagnosis, and estimate potential cost benefit.

Table 2. Examples of costs of minor and major investigations before and after Rheumatology Department review (correct up to February 2003).

Type of Investigation	Cost (£) per Test as Inpatient	Total Performed Before Review	Total Performed After Review	Total Cost (£) Before Review	Total Cost (£) After Review
CK-MB	19.50	38	5	741	97.5
ECG	19	56	5	1064	95
Chest radiograph	62	31	5	1922	310
TTE	59	5	0	295	0
EGD	300	5	0	4500	0
Angiogram (onsite)	1500	3	0	4500	0
Inpatient stay (per 24 h)	300	137 days	5 days	41,100	1500
Total expenditure, £				54,122	2002.5

CK-MB: (creatine kinase MB isoenzyme); ECG: electrocardiogram; TTE: transthoracic echocardiogram; OGD: esophago-gastro-duodenoscopy.

It is important to emphasize the limitations of this study. These include its retrospective design, lack of a control group, single clinical assessor, and potential bias given prior knowledge of the negative cardiac investigations. A larger study controlling for these limitations, with longer followup to rule out any coexistent cardiac disease, is required to confirm our observations. If early referral does indeed reduce costs then the savings for the National Health Service projected nationally could be considerable. The study also has potential implications for the further education of medical professionals, particularly those working in acute medical admission units.

ACKNOWLEDGMENT

We thank Martin Harvey for carrying out the initial cohort diagnosis search and Tim Ling for providing data on investigation costs.

APPENDIX

Minor Investigations
- Total creatine kinase (CK) and/or CK-MB
- C-reactive protein/plasma viscosity
- Antinuclear antibody and/or rheumatoid factor
- Arterial blood gases
- Chest radiograph
- Electrocardiogram (ECG)
- Random lipids

Major Investigations
- Exercise ECG
- 24 hour Holter monitoring
- Transthoracic echocardiogram
- Myoview (isotope perfusion scan)
- Angiogram
- Pulmonary function tests
- Isotope bone scan
- Gastroscopy
- Pain clinic referral
- Ventilation/perfusion scan
- Other (e.g., computed tomography scan)

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