Chest pain – a common feature of ankylosing spondylitis

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Summary: We compared the incidence, nature and frequency of chest pain in a group of 45 ankylosing spondylitis patients with an age and sex matched group of normals. Twenty-five ankylosing spondylitis patients had experienced recurrent chest pain compared to three normals, and had a significantly reduced chest expansion.

The presence of chest pain in ankylosing spondylitis can be an early presenting feature of the disease (eight patients had chest pain before spinal symptoms), and is associated with more severe disease.

Introduction

The diagnosis of recurrent chest pain in young adults is often difficult and despite intensive investigation many patients remain disabled and believe they suffer with serious heart disease.¹ The identification of other non-cardiac sources of pain is therefore invaluable in the management of some patients. Ankylosing spondylitis (AS) is variable in severity, often not recognized² and affects up to 1% of the population. It is therefore important to recognize that this common condition can present with chest pain. Two cases are presented in whom ankylosing spondylitis was not considered as a cause of chest pain. We also report a comparison of chest pain between a group of AS and normal controls with analysis of its relationship to disease severity.

Case reports

Case 1

A 32 year old male presented at casualty with a history of recurrent anterior chest pain. The pain was sharp in nature and aggravated by deep inspiration. Examination of the cardiovascular and respiratory system was normal. An electrocardiogram (ECG) and chest X-ray showed no abnormality. Because of tenderness over the sternocostal joints the patient was initially diagnosed as suffering with Tietze's syndrome. Following referral to the rheumatology department, it was apparent

that episodes of chest pain had occurred over the previous 4 years. Examination of the musculoskeletal system revealed reduced chest expansion at 1.75 in and reduced spinal movements. Pelvic X-ray showed bilateral sacroiliitis consistent with ankylosing spondylitis.

Case 2

A 48 year old male consulted his general practitioner with increasing chest pain that had become constant in nature with episodes of more acute 'pleuritic' pain. An ECG and chest X-ray were normal, but X-ray of the thoracic spine was suggestive of ankylosing spondylitis with early syndesmophyte formation. Examination of the spine revealed reduced spinal movements with chest expansion of 2 in. Bilateral sacroiliitis was present on pelvic X-ray and there was squaring with syndesmophyte formation on lumbar spine radiograph consistent with AS. Following treatment with indomethacin and physiotherapy, his chest symptoms improved.

Materials and methods

Forty-five consecutive patients (including Cases 1 and 2) with definite ankylosing spondylitis (New York criteria) were compared with 45 age and sex matched normals. Normals were age and sex matched healthy volunteers from the hospital staff with no history of hypertension, cardiac, respiratory or inflammatory joint disease. Four normals and six of the patients with AS were regular cigarette smokers. One patient with AS was on regular

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treatment for hypertension, the remaining were all normotensive. A questionnaire was designed which asked if they suffered with recurrent pain in the chest and if present, the length of time they had these symptoms, the frequency and nature of the pain. The mean chest expansion (mean of three readings in each individual) at the level of the 4th intercostal space from maximum inspiration to maximum expiration was measured. The length of morning stiffness, finger-floor distance, occiput to wall distance, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), alkaline phosphatase, immunoglobulin A, were measured in the patients with AS. Analysis of results was by the Chi-squared and the Mann-Whitney U-test.

Results

Significantly more AS patients than controls experienced chest pain (Table I). Eight of the AS patients had complained of chest pain before spinal symptoms and had been investigated for chest pain before the diagnosis of AS was made (mean=15 months, range 2–60 months, between onset of chest pain symptoms and diagnosis of AS). The frequency of chest pain varied from one episode each month that could last seconds only, to a continuous pain. The mean number of episodes per week was 2.3; the nature of the pain varied but was frequently sharp and pleuritic and often associated with anterior thoracic wall tenderness. The chest expansion was significantly reduced in the AS patients (Table I). In one of the three volunteers the pain was gastro-oesophageal in origin and in two it appeared to be musculo-skeletal in the absence of clinical spondylitis. The chest expansion in these three normal patients was greater than 2.5 in. Only a single patient with ankylosing spondylitis and chest pain had a chest expansion greater than 2.5 in. The AS patients who experienced chest pain appear to have more severe disease (Table II). They also had a higher mean CRP, ESR, alkaline

Table I Comparison between patients with AS and normals

	<i>Patients</i>	<i>Normals</i>
M:F ratio	42:3	42:3
Mean age (years)	37.8	36
Presence of chest pain	25 (63%)	3 (7%)*
Mean chest expansion (in)	1.4 (s.e. 0.11)	3.5 (s.e. 0.12)*

* $P < 0.001$.

Table II Comparison of AS patients with and without chest pain

	<i>With chest pain</i>	<i>Without chest pain</i>
Number	25	20
M:F ratio	22:3	20:0
Regular smokers	3	3
Mean age (range)	37 (21–55)	37.5 (21–54)
Disease history in years	13.1 (2–35)	8.6 (1–32)
Chest expansion (in)	1.3 (0.4–3.5)	1.6 (0.25–3.12)
Morning stiffness (min)	94 (0–720)	25 (0–210)*
Finger/floor distance (in)	8.2 (0–18)	5 (0–14)*

* $P < 0.05$.

phosphatase, IgA and occiput wall distance but these differences were not statistically significant.

Discussion

Patients with chest pain often think that it is cardiac in origin although it can be the presenting feature of numerous disorders.³ Despite intensive investigation, some patients remain disabled, still believing they have significant heart disease.⁴ It is not known what percentage of patients investigated in this way have AS. We have demonstrated that chest pain is common in AS, and that some patients complain of this symptom before the spinal disease is apparent. Our results suggest that AS patients with chest pain have more severe disease. The pain is often acute and associated with sudden inspiratory movements, although some patients experience pain during normal respiration.

Previous work⁵ has suggested that symptomatic involvement of the thorax in AS occurs early in the disease and is due to involvement of the thoracic girdle joints and muscle insertion sites. Enthesitis – inflammation at the site of attachment to bone of tendon, ligament or joint capsule – is the morphological hallmark of ankylosing spondylitis.⁶ The thorax has a plethora of sites for involvement by enthesitis producing chest pain and areas of tenderness (costovertebral, sternocostal, costochondral and sternal joints as well as ligamentous and tendon insertion sites). This association of chest pain and tenderness can lead to a misdiagnosis of Tietze's syndrome as seen in Case 1. The AS patients in this study did not have clinical or radiographic evidence of apical pulmonary fibrosis⁷ or cardiac involvement⁸ that seem to be later manifestations of the disease.

Although AS is known to cause chest pain mimicking heart pain⁹ it would seem from our experience that it is not well recognized. The frequency and severity of chest pain, as with other symptoms of AS, was improved by the use of a regular non-steroidal anti-inflammatory drug and exercise regime. Chest expansion cannot distinguish between AS patients with and without chest pain but it does allow differentiation between spondylitis and normals in accordance with diagnostic criteria.¹⁰ However a chest expansion of greater than 1 inch should not exclude AS in clinical practice. Chest expansion is variable within the normal

population;¹¹ from our study a chest expansion of less than 2.5 in in a patient with atypical chest pain should arouse suspicion and lead to careful examination of the spine to exclude AS.

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