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Original article

# Clinical characteristics of anterior chest wall pain in spondyloarthritis: An analysis of 275 patients

Muriel Elhai*, Simon Paternotte, Vincent Burki, Anne Durnez, Isabelle Fabreguet, Eugénie Koumakis, Magali Meyer, Judith Payet, Fanny Roure, Maxime Dougados, Laure Gossec*

*Rheumatology B Department, Cochin Hospital, AP–HP, Medicine Faculty, Paris Descartes University, 27, rue du Faubourg-Saint-Jacques, 75014 Paris, France*

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ABSTRACT

*Objectives:* Anterior chest wall pain is a common but little studied feature of spondyloarthritis. The objectives of our study were to assess the prevalence of anterior chest wall pain and to describe its clinical characteristics in a cohort of spondyloarthritis patients in a tertiary care center.
*Methods:* Study design: retrolective single center observational study in 2010 (COSPA). Consecutive patients with definite spondyloarthritis according to Amor's criteria were included. Data collection: each patient underwent direct interview by a physician. Prevalence of anterior chest wall pain, according to spondyloarthritis subtype and its date of appearance, localization and nature were collected.
*Results:* In all, 275 consecutive spondyloarthritis patients were assessed. Among them, 102 patients (37.1%) suffered from spondyloarthritis-associated anterior chest wall pain. It was the first symptom of spondyloarthritis in 3.6% of cases. The prevalence after 5 and 10 years following the diagnosis of spondyloarthritis was 26.0% and 35.5%, respectively. Pain was usually in the upper chest and acute, increased by respiratory movements and movements of the arm; pain during the night was less frequent (41.0%). A flare lasted on average 5 weeks; recurrences were frequent (75%). Non-steroidal anti-inflammatory drugs and anti-tumor necrosis factor agents were reported as effective in 49.3% and 80.0% of cases, respectively.
*Conclusion:* Anterior chest wall pain was a frequent manifestation in spondyloarthritis. It occurred early in the disease course, but the risk persisted after disease onset. Better knowledge of the clinical characteristics of this symptom may help physicians for diagnosis and follow-up.


## 1. Introduction

The diagnosis of spondyloarthritis (SpA) is often made with difficulty with a mean delay of five to eleven years between onset of symptoms and diagnosis [1,2]. An earlier diagnosis could allow a better management in particular in severe cases [3]. SpA is a heterogeneous disease, characterised by enthesitic involvement, which is assessed by scores including the entheses on the anterior chest wall [4,5]. The prevalence of anterior chest wall pain is unclear and highly variable from study to study: it has been reported in 24 to 88% of SpAs [6–12]. It seems to occur early in the disease course [7,8,10,13–16] and may be the first manifestation in 4 to 18% of cases [7,8,10,16]. Consequently a better knowledge of this pain might be helpful for earlier diagnosis.

There are few published data about clinical characteristics of chest wall pain in SpA [7–9,17]. Furthermore the existing data are issued from studies with small sample sizes.

This pain can simulate visceral disease [6–8,11,18]. Consequently considering the diagnosis of SpA might avoid, in some cases, unnecessary invasive investigations.

Prevalence and clinical characteristics of chest wall pain are not well determined; clinical questions include the localisation, nature, intensity and natural history of this pain as well as clinical features of SpA associated with chest pain.

The efficaciousness of different treatments on chest wall pain is rarely reported [19]. Anti-tumor necrosis factor (TNF) agents seem effective on enthesitic manifestations [20,21]; however specific effect of treatments on chest wall involvement is not clearly assessed.

When having diagnosed chest pain, clinicians may wonder, is such a manifestation a potential marker of severity in SpA? A small-scale comparison between patients with and patients without chest pain suggests association with a more severe disease [8].

Thus physicians are in need of more data to acknowledge and manage chest pain associated with SpA.

* Corresponding authors. Tel.: +33 1 58 41 25 62; fax: +33 1 58 41 26 28.
*E-mail addresses:* Muriel-elhai@hotmail.fr (M. Elhai), laure.gossec@cch.aphp.fr (L. Gossec).

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The objectives of this study were: to analyze the prevalence and the clinical characteristics of anterior chest wall pain in a cohort of patients with SpA in a tertiary care center; to determine the natural history and efficaciousness of different treatments received; and to compare SpA patients with versus without chest pain to detect a clinical pattern of SpA associated with this pain.

## 2. Methods

### 2.1. Study design

A cross-sectional retrolective observational study, COchin SPondylArthritis (COSPA), was performed between November 2009 and July 2010, in one tertiary referral center. The study was in accordance with ethical standards in France; oral informed consent was obtained from each patient.

### 2.2. Patients

Patients were selected from the unit database through the keywords "spondylarthrite", "spondylarthropathie" or "rhumatisme psoriasique". All patients living in Paris or in the suburb of Paris and seen in our department in the last 4 years were selected, if they fulfilled Amor's criteria [22]. In all, 1237 patients were selected; a random sample of 590 were contacted (Fig. 1).

### 2.3. General data collection

General data collected were age, sex, disease duration, SpA subtype (axial, peripheral, enthesitis or extra-articular): predominant manifestation according to the patient file, exact diagnosis (ankylosing spondylitis, reactive arthritis, chronic inflammatory bowel disease with arthropathy, psoriatic arthritis, undifferentiated spondylarthropathy or juvenile spondylarthritis), HLA B27 status, C-reactive protein rate, radiographic sacro-iliitis according to modified New York criteria [23] and treatments.

### 2.4. Anterior chest wall pain: data collection and interpretation

Data were collected based on face-to-face interview completed with medical files. The interviews were conducted by eight residents.

Anterior chest wall pain was defined as patients reporting orally and having reported in the clinical file, at least one episode of chest wall pain attributed by the rheumatologist to SpA at the time of the pain (i.e. after ruling out other causes of chest pain). To exclude some other potential causes of chest pain, an episode had to last at least one day. No other clinical characteristic was required. For previous similar episodes reported by the patient, the diagnosis was retrospectively retained in the absence of other causes of pain. Prevalence of anterior chest wall pain in the cohort and according to SpA subtypes (e.g., axial, peripheral or extra articular predominant manifestations) was calculated.

Clinical characteristics of chest pain were collected: date of appearance, the localization, nature of the pain (acute and/or chronic), intensity of pain, mean duration of the episodes, imaging investigations performed, specific or general treatments prescribed with their patient-reported efficacy.

Other manifestations at any time point e.g., uveitis, hip involvement, heel pain, psoriasis and inflammatory bowel disease were collected.

### 2.5. Severity of SpA

Severity of SpA was defined arbitrarily as bamboo spine (defined by a fusion of more than 80% of the vertebral bodies of the spine on the most recent radiographs), SpA-related hip involvement, height loss of more than five centimeters or a Bath Ankylosing Spondylitis Functional Index (BASFI) [24] superior to 40.

### 2.6. Statistical analyses

Prevalence was defined as the number of patients with at least one episode of anterior chest wall pain during their disease, over the total number of patients. Descriptive statistics were used for characteristics of the pain, imaging and treatments. Continuous variables were given as mean values (± Standard Deviation, SD). Time of appearance of the manifestation was analyzed by Kaplan Meier survival technique. Comparisons between patients with and without chest pain were performed by non-parametric tests (Wilcoxon/Fisher), concerning demographic characteristics, SpA subtype, exact diagnosis, disease duration and presence of criteria of severity of SpA. A multivariate analysis was planned to compare patients with versus without chest pain (by stepwise logistic regression) if $p$ value less than 0.20 in the univariate analyses. To take into account that this manifestation is related to disease duration, all patients with chest pain were compared to a subgroup of patients without chest pain but with disease duration at least equal to the median duration before appearance of this pain. $P$-values less than or equal to 0.05 were considered significant. Analyses were performed using the SAS statistical software version 9.1.

## 3. Results

### 3.1. Patients' characteristics

In all, 275 patients were included in COSPA (Fig. 1, Table 1). Mean age of the population was 44.6 (± 13.0) years, 169 (61.4%) were men, 199 (79.3% of available data) were HLA B27 positive, 190 (74.5% of available data) had radiographic sacroiliitis. Mean duration of the disease was 16.7 (± 11.8) years. Diagnosis was primary ankylosing spondylitis in 69.1% of cases and psoriatic arthritis in 17.8% of cases. In all, 161 (58.9%) and 139 (50.6%) patients received anti-TNF agents over the duration of the disease course and at the time of the interview, respectively.

### 3.2. Prevalence of anterior chest wall pain

#### 3.2.1. Prevalence in the cohort

One hundred and two patients (37.1%) suffered from SpA-associated chest wall pain.

#### 3.2.2. Prevalence according to time

The prevalence of chest pain after 5 and 10 years following the diagnosis of SpA was 26.0% (± 2.8) and 35.5% (± 3.4), respectively (Fig. 2). Among patients with anterior chest wall pain, pain appeared before the diagnosis of SpA in 34.1% of cases (30/88 with complete data), it was the first symptom of SpA in 9.8% of cases (10/102) and overall it appeared during the first 10 years of disease duration in 71.6% of cases (63/88). In cases of appearance of chest wall pain before the diagnosis of SpA, the mean delay before the diagnosis was 4.2 (± 5.9) years. In patients without anterior chest wall pain at the time of the diagnosis, the mean disease duration before appearance of chest pain was 7.4 (± 8.2) years.

#### 3.2.3. Prevalence according to SpA subtype

Anterior chest wall pain was more frequent in axial forms (40.8%, 82/201) than in other forms; it was reported in 23.2% (13/56) of predominant peripheral forms ($p < 0.05$).