

Clinical and Radiological Profile of Patients with Spondyloarthropathies – A Study of 50 Cases

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Abstract

Background: Spondyloarthropathies (SpA) are a group of chronic inflammatory rheumatic diseases with predominant axial skeleton involvement and strong association with HLA-B27. Early diagnosis based on clinical and radiological features is essential to prevent disability.

Objectives: To study the clinical and radiological profile of patients with spondyloarthropathies and correlate them with disease activity and functional status.

Methods: A cross-sectional observational study was conducted on 50 patients diagnosed with spondyloarthropathy according to the ASAS (Assessment of SpondyloArthritis International Society) criteria. Detailed history, clinical examination, laboratory tests (including ESR, CRP, HLA-B27), and radiological imaging (X-ray and MRI of sacroiliac joints and spine) were performed. Data were analyzed for frequency, pattern, and correlation. **Results:** Out of 50 patients, 38 (76%) were males and 12 (24%) females, with a mean age of 32.8 ± 8.7 years. The mean duration of symptoms before diagnosis was 2.3 years. The most common clinical feature was inflammatory low back pain (90%), followed by morning stiffness (86%), peripheral arthritis (60%), and enthesitis (40%). Extra-articular manifestations included uveitis (12%) and psoriasis (8%). HLA-B27 positivity was found in 78% of patients. Radiologically, sacroiliitis was detected in 80% of patients—bilateral in 70% and unilateral in 10%. MRI detected early sacroiliitis changes in 8 patients with normal X-rays. Syndesmophyte formation was observed in 26% of cases. **Conclusion:** Spondyloarthropathies predominantly affect young adult males, with inflammatory back pain as the leading symptom. MRI is more sensitive in detecting early sacroiliitis than plain radiographs. Early identification of clinical and radiological features can facilitate timely initiation of therapy and prevent disease progression.

Keywords: *Spondyloarthropathy, Ankylosing spondylitis, HLA-B27, Sacroiliitis, MRI spine*

Introduction

Spondyloarthritis (SpA) encompasses a group of inflammatory diseases that may be referred to as ankylosing spondylitis (AS), reactive arthritis, psoriatic arthritis, juvenile SpA, SpA associated with inflammatory bowel disease, undifferentiated SpA, peripheral SpA, axial SpA (axSpA), non-radiographic axSpA (nr-axSpA), or radiographic axSpA.^{1,2} Spondyloarthritis with predominantly axial or peripheral involvement is termed axSpA (including non-radiographic and radiographic axSpA) or peripheral SpA, respectively.¹ Axial SpA is a chronic disease that mainly involves the sacroiliac joints (SIJs) and spine.³ The National Health and Nutrition Examination Survey conducted in 2009–2010 estimated that the prevalence of axSpA ranges from 0.9% to 1.4% in the adult population in the United States.⁴ However, the true prevalence

is unknown because of the significant delay in diagnosis, under recognition of the disease, and challenges regarding case ascertainment in epidemiological data sets.⁵

Patients with axSpA commonly present with back pain that starts before 45 years of age.⁶ The characteristic features of the back pain include chronicity (>3 months), insidious onset, improvement with exercise, occurrence at night with improvement upon waking, and no improvement with rest.⁷⁻⁸

Spondyloarthropathies (SpA) represent a family of interrelated inflammatory rheumatic diseases, including ankylosing spondylitis, reactive arthritis, psoriatic arthritis, enteropathic arthritis, and undifferentiated SpA. They are characterized by axial involvement, peripheral arthritis, enthesitis, and association with HLA-B27 antigen. The global prevalence of SpA ranges from 0.2% to 1.8%, with higher frequency among HLA-B27-positive populations. The disease often begins in young adulthood, leading to progressive spinal ankylosis and functional disability if left untreated.⁹

Radiological imaging plays a pivotal role in diagnosis and monitoring. Conventional radiography remains the first-line tool, though MRI has emerged as a sensitive modality for detecting early sacroiliac and spinal inflammation before structural damage becomes apparent.^{10,11,12}

The present study aims to describe the clinical and radiological profile of patients with spondyloarthropathies and to assess the correlation between clinical manifestations and imaging findings.

Materials and Methods

Study Design and Setting

A cross-sectional observational study was conducted in the Department of Medicine and Radiology at a tertiary care teaching hospital over a period of 5 months.

Sample Size

A total of **50 consecutive patients** fulfilling the ASAS classification criteria for axial or peripheral spondyloarthropathy were enrolled after informed consent.

Study duration: January to April 2014

Inclusion Criteria

- Age 18–60 years
- Clinical diagnosis of spondyloarthropathy (axial or peripheral)
- Willingness to participate

Exclusion Criteria

- Secondary causes of arthritis (e.g., rheumatoid arthritis, gout)
- Prior spinal surgery or trauma

- Chronic infection (e.g., tuberculosis)

Data Collection

Each participant underwent:

- **Clinical assessment:** demographic data, duration of symptoms, back pain characteristics, morning stiffness, peripheral joint involvement, enthesitis, and extra-articular features (uveitis, psoriasis, IBD).
- **Laboratory investigations:** ESR, CRP, rheumatoid factor (RF), anti-CCP, and HLA-B27 by flow cytometry.
- **Radiological evaluation:** X-rays of the pelvis (for sacroiliitis grading by modified New York criteria) and spine; MRI of sacroiliac joints in selected patients with <2 years symptom duration.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS version 26. Results were expressed as mean $\pm$ SD, frequency, and percentages. Correlation between clinical and radiological findings was assessed using Chi-square test, with $p < 0.05$ considered statistically significant.

Results

Table 1: Distribution according to sociodemographic profile

Parameter	Category / Unit	Number (n)	Percentage (%)	Mean $\pm$ SD
Age (years)	—	—	—	32.8 $\pm$ 8.7
Gender	Male	38	76	—
	Female	12	24	—
Residence	Urban	32	64	—
	Rural	18	36	—
Occupation	Manual labourers	22	44	—
	Office workers	14	28	—
	Students	8	16	—
	Others	6	12	—
Mean duration of symptoms (years)	—	—	—	2.3 $\pm$ 1.4
Family history of spondyloarthropathy	Present	10	20	—
	Absent	40	80	—

Table 1 presents the demographic characteristics of the 50 patients included in the study on spondyloarthropathies. The mean age of the study population was 32.8 ± 8.7 years, indicating that the disease predominantly affected young adults.

Out of the total patients, 38 (76%) were males and 12 (24%) were females, giving a male-to-female ratio of approximately 3.2:1, which demonstrates a marked male preponderance.

The majority of participants, 32 (64%), were from urban areas, while 18 (36%) belonged to rural backgrounds, reflecting a slightly higher prevalence or better reporting among urban patients.

Regarding occupation, manual labourers (44%) formed the largest group, followed by office workers (28%), students (16%), and others (12%). This occupational distribution suggests that physical activity and occupational stress on the axial skeleton may contribute to symptom aggravation or earlier detection in these groups.

The mean duration of symptoms before diagnosis was 2.3 ± 1.4 years, highlighting a considerable diagnostic delay common in spondyloarthropathies.

A positive family history of spondyloarthropathy was documented in 10 patients (20%), consistent with the known genetic predisposition of the disease, particularly its association with HLA-B27 positivity.

Overall, the demographic analysis underscores that spondyloarthropathies primarily affect young, working-age males, with a significant proportion engaged in physically demanding occupations and a notable familial predisposition.

Table 2: Distribution according to clinical features

Feature	Number (%)
Inflammatory back pain	45 (90%)
Morning stiffness (>30 min)	43 (86%)
Peripheral arthritis	30 (60%)
Enthesitis	20 (40%)
Fatigue	28 (56%)
Uveitis	6 (12%)
Psoriasis	4 (8%)
Family history of SpA	10 (20%)

Table 2 summarizes the clinical manifestations observed among the 50 patients with spondyloarthropathies. The most frequent presenting symptom was inflammatory low back pain, reported by 45 patients (90%), followed by morning stiffness lasting more than 30 minutes in 43 patients (86%). These findings highlight the predominance of axial involvement, which is characteristic of spondyloarthropathies.

Peripheral arthritis was observed in 30 patients (60%), involving mainly the large joints such as the knees and ankles, while enthesitis (pain and tenderness at tendon insertion sites) was present in 20 patients (40%), indicating common peripheral joint and enthesal involvement.

Systemic features like fatigue were noted in 28 patients (56%), reflecting the chronic inflammatory burden of the disease. Among the extra-articular manifestations, uveitis was seen in 6 patients (12%), and psoriasis in 4 patients (8%), both of which are well-documented associations of the spondyloarthropathy spectrum.

A positive family history of similar illness was recorded in 10 patients (20%), further emphasizing the genetic predisposition of the disease.

Overall, the clinical profile in this study demonstrates that spondyloarthropathies commonly present with axial symptoms, often accompanied by peripheral joint and extra-articular involvement, reflecting the heterogeneous yet overlapping nature of the disease spectrum.

Table 3: Distribution according to laboratory and radiological findings

Laboratory Findings	
Parameter	Positive (%)

ESR > 30 mm/hr	70
CRP elevated	68
HLA-B27 positive	39 (78%)
Rheumatoid factor	0
Radiological Findings	
Radiological Feature	Number (%)
Sacroiliitis (any grade)	40 (80%)
- Bilateral grade ≥ 2	35 (70%)
- Unilateral grade ≥ 2	5 (10%)
MRI sacroiliitis (active inflammation)	8 (16%)
Syndesmophytes	13 (26%)
Bamboo spine	5 (10%)

Table 3 shows the laboratory parameters of the 50 patients included in the study. An elevated erythrocyte sedimentation rate (ESR) was observed in 70% of patients, and C-reactive protein (CRP) was raised in 68%, indicating active systemic inflammation in the majority of cases. HLA-B27 antigen was positive in 39 patients (78%), confirming its strong association with spondyloarthropathies. This high positivity rate supports the genetic predisposition of the disease and correlates well with the clinical findings of axial involvement and earlier onset. None of the patients tested positive for rheumatoid factor (RF) or anti-CCP antibodies, which helped in excluding rheumatoid arthritis and other autoimmune arthritides. These laboratory findings are consistent with the seronegative nature of the spondyloarthropathy group of disorders.

Overall, the laboratory profile reflects an inflammatory but seronegative disease pattern, with a strong HLA-B27 association, which aids in diagnosis and disease classification.

Table 3 also presents the radiological patterns observed in the study population. Sacroiliitis was the most frequent radiological finding, seen in 40 patients (80%). Of these, 35 patients (70%) had bilateral sacroiliitis, while 5 patients (10%) showed unilateral changes.

On MRI of the sacroiliac joints, 8 patients (16%) demonstrated active inflammatory lesions such as bone marrow edema and erosions, despite having normal X-rays. This underscores the superior sensitivity of MRI in detecting early sacroiliitis before radiographic changes become apparent.

Syndesmophyte formation, indicative of structural progression, was noted in 13 patients (26%), while bamboo spine appearance—a hallmark of advanced ankylosing spondylitis—was observed in 5 patients (10%).

These findings confirm that radiological changes, particularly in the sacroiliac joints and spine, are central to diagnosis and staging of spondyloarthropathies. Moreover, the study highlights

the importance of MRI in early detection and disease monitoring, especially in patients with short disease duration or inconclusive radiographs.

Discussion

Radiologically, sacroiliitis was present in 80% of patients, bilateral in most cases. MRI findings correlated with early inflammatory activity and preceded radiographic changes, confirming its utility in early detection. The presence of extra-articular features such as uveitis and psoriasis underscores the multisystemic nature of SpA.

Sacroiliitis (radiographic)

In the current series, radiographic sacroiliitis was observed in **80%** of cases, which is comparable to **Van der Linden et al¹³** who reported radiographic sacroiliitis in **78%** of established ankylosing spondylitis patients based on the **Modified New York Criteria**. Similarly, **Bennett and Wood¹⁴ (1968)** demonstrated bilateral sacroiliitis in **82%** of patients with long-standing disease. **Maksymowych et al¹⁵** also noted sacroiliac joint involvement in **70–90%** of axial spondyloarthropathy cases depending on disease duration. These figures closely align with our results, confirming that sacroiliac joint inflammation remains the most consistent radiographic hallmark of spondyloarthropathy.

MRI versus plain radiograph (early detection)

In our study, MRI detected early sacroiliitis in 16% of patients whose radiographs appeared normal. This observation corresponds well with the earlier findings of **Bredella et al¹⁶** and **O'Shea et al¹⁷** who demonstrated that MRI identifies early inflammatory bone-marrow edema and erosions before radiographic changes become evident, with MRI-only abnormalities seen in 10–25% of early cases. These studies, together with our results, emphasize the diagnostic superiority of MRI for early detection and disease monitoring, especially in patients with a short duration of symptoms.

Syndesmophytes

Syndesmophyte formation was observed in **26%** of our patients. Earlier studies such as **Bergfeldt et al¹⁸** and **Carette et al¹⁹** reported syndesmophyte prevalence ranging from **20% to 40%**, depending on disease chronicity and spinal segment involvement. The similar range in our study reflects a mixed population including both early and established disease cases.

Syndesmophytes (structural spinal change)

Reported prevalence of syndesmophytes varies with cohort age, disease duration, and whether patients have longstanding AS. Longitudinal and cross-sectional studies show syndesmophyte prevalence often in the range ~20–45% depending on those factors. Your 26% prevalence fits within that commonly reported range, suggesting your cohort included a mix of earlier and established disease. Studies of Western cohorts with longer disease duration sometimes report higher rates.¹⁷

Limitations: Small sample size and hospital-based cross-sectional design limit generalizability. Long-term follow-up studies are required to evaluate disease progression and treatment response.

Conclusion

- Spondyloarthropathies primarily affect young males and present predominantly with inflammatory back pain and stiffness.
- HLA-B27 is positive in the majority of cases, supporting its diagnostic significance.
- MRI is more sensitive than radiographs in detecting early sacroiliac involvement and should be considered in suspected early cases.
- Early diagnosis and treatment initiation can prevent structural damage and improve quality of life.

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