

# Study to Find the Prevalence of Axial Spondyloarthropathy in Patients with Inflammatory Back Pain at a Tertiary Health Care Centre

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## Abstract

**Aim:** The purpose of our study is to find the prevalence of axial spondyloarthropathy as per the ASAS criteria in patients with inflammatory back pain presenting to a tertiary health care centre.

**Methods:** We did a prospective observational study between May 2013 to October 2014 at a tertiary referral hospital in Western India. All patients satisfying the inclusion criteria underwent detailed history (psoriasis, uveitis, inflammatory bowel disease, arthritis, enthesitis (heel pain), family history of low back pain), examination (spine, Schober's test, chest expansion, SI joint compression test) and investigations (MRI sacroiliac joint (reported by radiologist), X-ray sacroiliac joint (reported by radiologist), HLA B27, acute phase reactants (ESR, CRP). A diagnosis of axial spondyloarthropathy (axial SpA) was made if a patient fulfilled the ASAS criteria for diagnosis of axial spondyloarthropathy. Ankylosing spondylitis was diagnosed if Modified New York criteria were met.

**Results:** Out of the 75 patients included in the study, 57(76%) were males and 18(24%) were females. The age range of the patients at presentation was 18 years- 48 years, the mean age being 28.61 ( $\pm$  6.9) yrs. And 36(48%) could be diagnosed as having axial spondyloarthropathy according to ASAS criteria. Of these, 15(41.67%) patients could be diagnosed as ankylosing spondylitis, according to modified New York criteria. The rest 21(58.33%) patients had MRI showing sacroiliitis but no evidence of sacroiliitis on X-ray, these were labelled as non - radiographic axial spondyloarthropathy (nr-axial SpA).

**Conclusion:** The prevalence of axial spondyloarthropathy as per the ASAS criteria in patients with inflammatory back pain at a tertiary health care centre was found to be 48%. The percentage of cases that did not have sacroiliitis on X-ray but had sacroiliitis on MRI, out of all cases having sacroiliitis on MRI was found to be 58.33%. Early diagnosis of this entity is essential to potentially start early treatment and prevent or delay long term morbidity.

**Keywords:** Inflammatory back pain; Axial spondyloarthropathy

## Study Rationale

There is an unacceptably long delay, from 5 to 10 years, between the first occurrence of AS symptoms and a diagnosis of AS. Two major reasons can be named for such a delay: (a) There is low awareness of ankylosing spondylitis and it can be seen as a major challenge for any physician in primary care to think of and to identify patients with inflammatory spine disease among the large group of patients with chronic back pain, most often of another origin. (b) Radiographic sacroiliitis grade 2 bilaterally or grade 3 or 4 unilaterally is a requirement for making the diagnosis of AS according to the modified New York criteria, 1984. However, radiographic changes indicate chronic changes and damage of the bone and are the consequence of inflammation and not active inflammation itself. Since AS is a slowly progressing disease as far as radiographic changes are concerned, definite sacroiliitis on plain radiographs appears relatively late, frequently taking several years of continuous or relapsing inflammation [6]. In a follow-up study of 40 patients with inflammatory back pain, 77% out of all patients who developed radiographic sacroiliitis (AS) had a positive MRI (magnetic resonance imaging) at baseline and 62% of those patients with baseline MRI sacroiliitis developed radiographic sacroiliitis after a mean follow-up of 7.7 years [7]. In a study from China, 87% of patients with a positive MRI of the SI-joints at baseline developed radiographic sacroiliitis over a follow-up period of 5-10 years [8]. The term Axial Spondyloarthropathy (SpA), includes patients early in the course of the disease. It does not require X-ray changes of sacroiliitis for its diagnosis. According to ASAS criteria Axial SpA is diagnosed if patient has MRI showing sacroiliitis along with one of the following features (inflammatory back pain (IBP), arthritis, enthesitis (heel), uveitis, dactylitis, psoriasis, Crohn's/ulcerative colitis, good response to NSAIDs, family history for SpA, HLA-B27, elevated CRP) or HLA-B27 positivity with two of the associated features [9]. Early diagnosis is essential to improve the quality of life of these patients.

**Purpose:** The purpose of this study is to find the prevalence of axial spondyloarthropathy as per the ASAS criteria in patients with inflammatory back pain presenting to a tertiary health care centre.

## Methods

We did a prospective observational study between May 2013 to October 2014 at a tertiary referral hospital in Mumbai. The study was approved by the Institutional Ethics Committee. A detailed written, informed consent was obtained from all patients prior to enrolment in the study. We included 75 consecutive patients presenting with inflammatory back pain according to ASAS criteria. Patients with malignancy or infection, traumatic spinal injury, spinal deformity, mechanical back pain and those not willing to participate in the study were excluded.

All patients satisfying the inclusion criteria underwent detailed history (psoriasis, uveitis, inflammatory bowel disease, arthritis,

## Introduction

### Background

About two third of adults suffer from low back pain at some time. For patients with nonspecific low back pain, a precise pathoanatomical diagnosis is often impossible, which leads to various imprecise diagnosis [1]. Recovery from nonspecific low back pain is generally rapid. In a study, 90 percent of the patients seen within three days of onset recovered in two weeks [2]. Hence, patients with red flags only are recommended investigations and 'inflammatory back pain' (IBP) is one such red flag. A study by Calin A, et al [3]. Rudwailt M, et al [4]. and Sieper J, et al. [5] in ASAS (Assessment of SpondyloArthritis international Society) have defined characteristics of inflammatory back pain. Inflammatory back pain is a hallmark of Ankylosing Spondylitis (AS). The term 'ankylosing spondylitis' was introduced around 1900 at the time when diagnosis could be made only on the basis of the clinical experience, without the help of imaging or laboratory results.

enthesitis (heel pain), family history of low back pain), examination (spine, Schober's test, chest expansion, SI joint compression test) and investigations (MRI sacroiliac joint (reported by radiologist), X-ray sacroiliac joint (reported by radiologist), HLA B27, acute phase reactants (ESR, CRP). A diagnosis of axial spondyloarthritis (axial SpA) was made if a patient fulfilled the ASAS criteria (Table 1) for the diagnosis of axial spondyloarthritis. Ankylosing spondylitis was diagnosed if Modified New York criteria (1984, Table 2) were met (These patients had MRI and X-rays, both showing sacroiliitis. So they had radiographic axial spondyloarthritis i.e. r-axial SpA). Patients who had MRI showing sacroiliitis but no evidence of sacroiliitis on X-ray were labeled as non – radiographic axial spondyloarthritis (nr-axial SpA).

Our outcome measures were 1.Prevalence of axial spondyloarthritis as per the ASAS criteria in patients with inflammatory back pain at a tertiary health care centre, and 2. Percentage of cases whom do not have sacroiliitis on x-ray but have sacroiliitis on MRI, out of all cases having sacroiliitis on MRI. In addition, this study provides the characteristics of the subjects well, such as demographics, history, physical findings, X-ray findings, MRI findings, HLA B-27, ESR, CRP. Data analysis was done by independent authority using SPSS software.

## Results

Out of the 75 patients included in the study, 57(76%) were males and 18(24%) were females. The age range of the patients at presentation was quite wide 18 years- 48 years, the mean age being 28.61 ( $\pm 6.9$ ) yrs. The age wise distribution of these patients was as per table 3. Also, the age wise distribution of onset of symptoms was as per table 4. 36(48%) could be diagnosed as having axial spondyloarthritis according to ASAS criteria. Of

IBP according to ASAS experts (to be applied for the patients with chronic back pain (>3months) <sup>5</sup>	
1.	Age at onset < 40 years
2.	Insidious onset
3.	Improvement with exercise
4.	No improvement with rest
5.	Pain at night (with improvement upon getting up) The criteria are fulfilled if at least four out of five parameters are present

**Table 1:** IBP according to ASAS experts.

Modified New York Criteria	
Clinical criteria	<ul style="list-style-type: none"> <li>Low back pain and stiffness for &gt;3 months that improves with exercise but not with rest.</li> <li>Limitation of lumbar spine mobility in both the sagittal and frontal planes</li> <li>Limitation in chest expansion as compared with normal range for age and sex</li> </ul>
Radiographic criteria	<ul style="list-style-type: none"> <li>Unilateral sacroiliitis of grade 3-4 or</li> <li>Bilateral sacroiliitis of grade 2 or above</li> </ul>
Diagnosis of ankylosing spondylitis is made if the radiologic condition is associated with at least one clinical criteria	

**Table 2:** Modified New York criteria, 1984 [10].

Age	Number of Patients
Upto 20 yrs	7
21-30 yrs	37
31-40 yrs	27
41-50 yrs	4

**Table 3:** Age wise patient distribution.

Age	Number of Patients
Upto 20 yrs	17
21-30 yrs	31
31-40 yrs	27

**Table 4:** Age wise onset of symptoms.

	Total	Axial Spondyloarthritis	Ankylosing Spondylitis
Number of patients	75	36	15
Seen medical practitioner before	49 (65.33%)	26 (72.22%)	14 (93.33%)

**Table 5:** Patients in the study who had sought medical help before.

these, 15(41.67%) patients could be diagnosed as ankylosing spondylitis, according to modified New York criteria. The rest 21(58.33%) patients had MRI showing sacroiliitis but no evidence of sacroiliitis on X-ray, these were labeled as non – radiographic axial spondyloarthritis(nr-axial SpA). Out of the 36 patients who were diagnosed as axial spondyloarthritis, 33(91.67%) were males and 3(8.33%) were females. All of the 15(100%) patients who were diagnosed as ankylosing spondylitis were males. Out of the rest 21 patients of as non –radiographic axial spondyloarthritis 18(85.71%) were males and 3(14.29%) were females. Out of the 75 patients included in the study, 57 were males and 18 were females. Out of these 57 males, 33(57.89%) were diagnosed as axial spondyloarthritis. Out of the 18 females included in the study, 3(16.67%) were diagnosed as axial spondyloarthritis. Of all the patients diagnosed as axial spondyloarthritis, 25(69.44%) patients had onset of symptoms before age of 30 yrs. Of those diagnosed as ankylosing spondylitis, 11(73.33%) had onset before 30 years. Of those diagnosed as non – radiographic axial spondyloarthritis, 14(66.67%) had onset before 30 years.

Out of the 75 patients included in the study, 49(65.33%) were previously visited a doctor (Table 5). Of these 29 were visited an orthopedist, 14 were visited a general practioner and 6 were visited practioners of alternative medicine. Of these 49 patients who had previously visited a doctor, 21 were told that they had mechanical back pain, 10 had been told they were suffering from prolapsed intervertebral disc and in 18 patients no cause was stated. Out of 36 patients diagnosed as axial spondyloarthritis, 26 had visited a doctor before. 12 of these were diagnosed to have mechanical back pain, 6 were diagnosed as prolapsed intervertebral disc and in eight patients no diagnosis was made. Out of 15 patients diagnosed as ankylosing spondylitis, 14 had visited a doctor before. Seven of these were diagnosed to have mechanical back pain, four were diagnosed as prolapsed intervertebral disc and in three patients no diagnosis was done. Different forms of treatments taken by these patients included back exercises, pelvic traction, alternative medications, bed rest, steroids and non steroidal antiinflammatory medications.

Out of the 36 patients who were diagnosed as axial spondyloarthritis, nine patients (25%) had history of enthesitis (heel pain), two patients (5.5%) had history of peripheral arthritis(1 patient had history of knee arthritis, 1 patient had history of ankle arthritis), one (2.78%) had history of acute anterior uveitis, 10 patients (27.8%) had positive family history (first or second degree relative having ankylosing spondylitis, psoriasis, uveitis, reactive arthritis or inflammatory bowel disease) and one patient (1.3%) had history psoriasis (Table 6). Among them 33 patients (91.67%) had good response to NSAIDs (24 – 48 hours after a full dose of non steroidal anti inflammatory drug (NSAID). None of the patients

Associated Symptoms in Patients With Axial Spondyloarthropathy	
Total cases	36
Enthesitis	9 (25%)
Peripheral arthritis	2(5.5%)
Uveitis	1 (2.78%)
Positive family history	10 (27.8%)
Psoriasis	1 (2.78%)

**Table 6:** Axial spondyloarthropathy Associated symptoms.

	All patients	Axial Spondyloarthropathy	Ankylosing Spondylitis	Non-radiographic Axial Spondyloarthropathy
Number of patients	75	36	15	21
Patients with positive SI joint test	26 (34.7%)	26 (72.2%)	13 (86.7%)	13 (61.9%)

**Table 7:** Association with positive SI joint test.

Group	Schober's Test (cms)
Axial spondyloarthropathy	4.04
Ankylosing spondylitis	2.7
Non-radiographic axial spondyloarthropathy	4.8

**Table 8:** Schober's test.

Group	Chest expansion (cms)
Axial spondyloarthropathy	3.97
Ankylosing spondylitis	3.2
Non-radiographic axial spondyloarthropathy	4.6

**Table 9:** Chest Expansion.

had spinal deformity or neurological deficit. Out of the 75 patients included in the study, 26 patients (34.7%) tenderness over sacroiliac joints and a positive sacroiliac joint stress test. Out of the 36 patients diagnosed as axial spondyloarthropathy, 26 patients (72.2%) had tenderness over sacroiliac joints and a positive sacroiliac joint stress test (Table 7). Out of the 15 patients diagnosed as ankylosing spondylitis, 13 patients (86.7%) had tenderness over sacroiliac joints and a positive sacroiliac joint stress test. Out of the 21 patients diagnosed as non-radiographic axial spondyloarthropathy, 13 patients (61.9%) had tenderness over sacroiliac joints and a positive sacroiliac joint stress test. Schober's test was used to measure the extent of restriction of lumbar flexion. The mean value of Schober's test in patients with axial spondyloarthropathy was 3.97 ( $\pm 1.41$ ) cms, in patients of ankylosing spondylitis was 2.7 ( $\pm 0.78$ ) cms, and in patients of non-radiographic axial spondyloarthropathy was 4.9 ( $\pm 0.99$ ) cms (Table 8). The restriction of chest movement during respiration was measured by measuring the chest expansion at the level of nipples (T4). The mean value of chest expansion in patients with axial spondyloarthropathy was 4.04 ( $\pm 1.14$ ) cms, in patients of ankylosing spondylitis was 3.2 ( $\pm 0.65$ ) cms, and in patients of non-radiographic axial spondyloarthropathy was 4.6 ( $\pm 1.02$ ) cms (Table 9). Out of the 36 patients of axial spondyloarthropathy, 25(69.44%) tested positive for HLA-B27. None of the remaining 39 patients of inflammatory back pain in the study tested HLA-B27 positive. Out of the 15 patients who were diagnosed as ankylosing spondylitis, 9(60%) were HLA-B27 positive. Amongst the 21 patients of non-radiographic axial spondyloarthropathy, 16(76.19%) were HLA-B27 positive. Out of the 75 patients of inflammatory back pain who were included in the study, 36 patients had MRI suggestive of sacroiliitis and 15 of these patients had radiographic (X-ray) changes of sacroiliitis.

## Discussion

In a study from Germany by Brandt HC, et al. [11] orthopedist and primary-care doctors were requested to refer patients with (1)

chronic low back pain (duration >3 months) and (2) onset of back pain before 45 years of age to a specialist rheumatology outpatient clinic for further diagnostic investigation if at least one of the following screening parameters was present: (1) inflammatory back pain, (2) positive human leucocyte antigen B27, and (3) sacroiliitis detected by imaging. The final diagnosis of axial spondyloarthropathy was made according to expert opinion. In our study, only inflammatory back pain was used as inclusion criteria. None of the 75 patients included had undergone testing for HLA-B27 or MRI of sacroiliac joints prior to inclusion in the study. In the German study by J Sieper, in total, 350 referred cases were analyzed. A diagnosis of definite axial spondyloarthropathy (axial SpA), comprising established ankylosing spondylitis and non-radiographic axial SpA, could be made in 45.4% of all referred patients (of which 50.3% were classified as ankylosing spondylitis and 49.7% as nonradiographic axial SpA). In our study, out of the 75 patients included, 36(48%) were diagnosed as axial spondyloarthropathy. Of these 15(41.67%) were diagnosed as ankylosing spondylitis and 21(58.33%) were classified as nonradiographic axial spondyloarthropathy. Thus our findings are comparable to previous findings.

In our study, out of the 75 patients included, 57(76%) were males and 18(24%) were females. Out of these 57 males, 33(57.89%) were diagnosed as axial spondyloarthropathy. Out of the 18 females included in the study, 3(16.67%) were diagnosed as axial spondyloarthropathy. Thus, in our study, axial spondyloarthropathy was 3.47 times more common in males with inflammatory back pain than in females with inflammatory back pain. Axial spondyloarthropathy commonly starts in the second or third decade of life. In our study, of all the patients diagnosed as axial spondyloarthropathy, 25(69.44%) patients had onset of symptoms before age of 30 yrs. Of those diagnosed as ankylosing spondylitis, 11(73.33%) had onset before 30 years. Of those diagnosed as non-radiographic axial spondyloarthropathy, 14 (66.67%) had onset before 30 years. Sieper J, et al. have argued that the non-radiographic and radiographic stages (i.e. ankylosing spondylitis) of axial spondyloarthropathy (SpA), should be treated as one disease, that radiographic sacroiliitis should not be an essential diagnostic parameter but rather a parameter for severity or chronicity, and that a diagnosis in the non-radiographic stage can be made reliably if a combination of clinical, laboratory and imaging (especially MRI) parameters are applied [11-13]. In our study, the mean duration of symptoms in patients detected as ankylosing spondylitis was 83.20( $\pm 46.58$ ) months, while that in patients detected as nonradiographic spondyloarthropathy was 14.00( $\pm 14$ ) months.

In a study by Aggrawal R and Malaviya AN [14] the mean diagnostic delay in the diagnosis of ankylosing spondylitis in Indian patients was found to be 6.9 ( $\pm 5.2$ ) years. In our study, in the 15



patients who were diagnosed to have ankylosing spondylitis, the average duration of symptoms prior to diagnosis (diagnostic delay) was 83.2 ( $\pm 46.58$ ) months (i.e. 6.92( $\pm 3.88$ ) years). In the study by Aggrawal R and Malaviya AN, it was shown that delayed diagnosis led to statistically more severe disease activity, functional derangement and damage. The cause of delay in the diagnosis of AS among Indian patients was attributed to inability of the first level health-care providers to recognize inflammatory back pain and other spondyloarthropathy symptoms. Incorrect initial diagnosis included non-specific back pain (35.1%), degenerative disc disease (25.9%), rheumatoid arthritis (20.37%), and tuberculosis of spine (16.6%) in that order, for which the patient received, prolonged treatment. Most incorrect initial diagnoses were made by orthopedist (75.9%), followed by general physician (50%) 29. In our study, out of 36 patients diagnosed as axial spondyloarthropathy, 26 had visited a doctor before. In patients, 12 of these were diagnosed to have mechanical back pain, six were diagnosed as prolapsed intervertebral disc and in eight patients no diagnosis was made. Out of 15 patients diagnosed as ankylosing spondylitis, 14 had visited a doctor before. Seven of these were diagnosed to have mechanical back pain, four were diagnosed as prolapsed intervertebral disc and in three patients no diagnosis was made.

HLA-B27 is a suitable screening parameter because of its high sensitivity and specificity and because there is an unequivocal positive or negative result. In our study 69.44% of patients diagnosed as axial spondyloarthropathy were HLA-B27 positive. HLA-B27 positivity in the patients diagnosed as ankylosing spondylitis was 60% and in those diagnosed as non-radiographic axial spondyloarthropathy was 76.19%. However, it has to be stressed that for diagnosis, HLA-B27 can only be used in combination with other clinical, laboratory or imaging parameters.

## Conclusion

The prevalence of axial spondyloarthropathy as per the ASAS criteria in patients with inflammatory back pain at a tertiary health care centre was found to be 48%. The percentage of cases who did not have sacroiliitis on X-ray but had sacroiliitis on MRI, out of all cases having sacroiliitis on MRI was found to be 58.33%. Early diagnosis of this entity is essential to potentially start early treatment and prevent or delay long term morbidity.

## Conflict of Interest

All the authors declared that they have no conflict of interest.

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