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Clinical and Demographic Profile of Axial Spondyloarthritis: Insights from a Tertiary Care Center

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ABSTRACT

Background: Axial spondyloarthritis (Ax-SpA) is a chronic inflammatory condition that predominantly affects the spine and sacroiliac joints. Understanding the demographic and clinical characteristics of Ax-SpA patients is crucial for improving disease management. This study aimed to evaluate the clinic demographic profile of Ax-SpA patients attending a tertiary care center in Bangladesh. ***Materials and Methods:*** This single-center, cross-sectional observational study was conducted at a tertiary care center in Bangladesh from January 2023 to January 2024. It enrolled Ax-SpA patients aged ≥18 with high disease activity (ASDAS-CRP >2.1) and systematically collected demographic, clinical, and laboratory data. ***Results and Discussion***: This study enrolled 101 patients with axial spondyloarthritis (Ax-SpA). The mean age of the participants was 33.8 ± 10.41 years, with the majority being male (65.3%). Most participants were married (69.3%) and had education up to secondary school certificate (58.4%). The most common first symptom was low back pain (43.6%), followed by lower limb arthritis (35.6%). About 30% of participants had a positive family history of spondyloarthritis. The mean body mass index was 23.97 ± 4.63 kg/m², and the mean disease duration was 8.56 ± 5.77 years, with the average age at diagnosis being 30.74 ± 9.58 years. Comorbidities included dyslipidemia (25.7%), diabetes mellitus (10.9%), and hypertension (8.9%). The distribution of HLA-B27 status showed that 48.5% tested positive, 5.9% tested negative, and 45.6% did not undergo testing. ***Conclusion:*** This study provides valuable insights into the clinicodemographic characteristics of Axial Spondyloarthritis patients in Bangladesh. These findings reveal diagnostic delay in most of the patients, with some presenting with advanced features. Early detection through awareness is important to reduce patient suffering. It is important for healthcare planning and the development of targeted interventions to improve the management and outcomes of Ax-SpA patients.

Keywords: Axial Spondyloarthritis (Ax-SpA), Disease Activity, HLA-B27, Comorbidities, Disease Burden, Bangladesh.

INRODUCTION

Axial spondyloarthritis (Ax-SpA) is a chronic condition commonly affecting the axial skeleton, resulting in pain, stiffness, and functional impairments.[1] It includes a range of disorders, including ankylosing spondylitis, and is associated with considerable morbidity and diminished quality of life.[2] The disease typically appears in young adults, with common symptoms such as low back pain (LBP), arthritis, and enthesitis.[3] Ax-SpA is also linked to comorbidities like dyslipidemia, diabetes, and hypertension, which can make disease management more challenging.[4] The presence of the HLA-B27 genetic marker is a key diagnostic feature, though its prevalence varies across populations.[5] Axial spondyloarthritis (Ax-SpA) is a significant cause of morbidity, particularly in young adults, as it often manifests in the second or third decade of life.[2] The disease is associated with a range of clinical features, including peripheral arthritis, enthesitis, and extra-articular

manifestations such as uveitis, psoriasis, and inflammatory bowel disease.[7] Ax-SpA is underdiagnosed and undertreated, especially in resource-limited settings, because of varied symptoms and limited diagnostic resources.[8] The burden of Ax-SpA extends beyond physical symptoms, as it significantly affects patients' quality of life.[9] ASDAS consistently shows high disease activity in individuals with Ankylosing Spondylitis.[10] Furthermore, comorbidities such as dyslipidemia, diabetes, and hypertension are frequently observed in Ax-SpA patients, compounding the challenges of disease management.[11] These comorbidities, along with the chronic nature of the disease, contribute to increased healthcare utilization, work absenteeism, and economic burden.[12] Despite advancements in Ax-SpA research, gaps remain in understanding its demographic, clinical characteristics, and the impact of lifestyle factors, rural-urban environments, and HLA-B27 accessibility. Addressing these gaps is essential for targeted interventions and improving patient outcomes.This study was designed to address these gaps by evaluating the demographic, clinical, and laboratory characteristics of Ax-SpA patients, as well as their disease activity and quality of life. By providing a comprehensive overview of the disease burden in this population, the study aims to inform clinical practice and guide future research efforts. The findings are expected to contribute to a better understanding of Ax-SpA and its impact, ultimately supporting the development of more effective diagnostic and therapeutic strategies tailored to the needs of diverse patient populations.

METHODOLOGY

Study Setting

The study was conducted in the Department of Rheumatology, Bangabandhu Sheikh Mujib Medical University (BSMMU), a tertiary care center in Bangladesh, from January 2023 to January 2024.

Study Design

This was a single-center, cross-sectional observational study aimed at evaluating the clinical and demographic profile of Axial Spondyloarthritis (AxSpA) patients attending a tertiary care center in Bangladesh. The study sought to explore the characteristics and disease patterns in a real-world clinical setting.

Study Population

The study included patients aged 18 years or older diagnosed with Axial Spondyloarthritis (AxSpA) based on the Assessment of Spondyloarthritis International Society (ASAS) criteria. Patients with high to very high disease activity, defined by an Ankylosing Spondylitis Disease Activity Score (ASDAS-CRP) of >2.1, were selected. Exclusion criteria comprised incomplete medical records, non-axial forms of spondylarthritis, and patients with overlapping autoimmune conditions that could confound the analysis.

Data Collection

Clinical and demographic data were systematically collected. Demographic variables included age, sex, educational status, and socioeconomic background. Clinical features such as disease duration, family history, peripheral arthritis, enthesitis, uveitis, and dactylitis were documented. Laboratory investigations, including CBC, ESR, CRP, liver and renal function tests, and radiological findings such as sacroiliac joint X-rays and HLA-B27 status, were recorded.

Safety assessments

Safety assessments, including adverse events, laboratory tests, and vital signs were monitored at each follow-up throughout the study period. Necessary steps were taken for the treatment of these adverse events.

Data Analysis

Statistical analysis was conducted using SPSS software (Version 25). Continuous variables were summarized as means with standard deviations, and categorical data were expressed as frequencies and percentages.

Operational Definitions

HLA-B27: HLA-B27 is a specific gene associated with immune responses. It is commonly tested through blood tests, where the presence of the antigen indicates an increased risk of autoimmune diseases like Axial Spondyloarthritis (AxSpA), including ankylosing spondylitis. However, its presence alone is not diagnostic.

ASDAS CRP (Ankylosing Spondylitis Disease Activity Score C-reactive Protein)

The ASDAS CRP evaluates disease activity in Ankylosing Spondylitis by combining C-reactive protein (CRP) levels with clinical assessments. A higher score reflects higher disease activity and inflammation.

ASDAS ESR (Ankylosing Spondylitis Disease Activity Score Erythrocyte Sedimentation Rate)

Similar to ASDAS CRP, this score uses the ESR, a marker of inflammation, combined with clinical assessments to assess disease activity. Higher scores indicate more severe disease activity.

ASQoL (Ankylosing Spondylitis Quality of Life)

ASQoL is a questionnaire with 18 items to assess the quality of life in individuals with Ankylosing Spondylitis. Higher scores suggest worse quality of life due to physical and emotional impact.

HAQ-DI (Health Assessment Questionnaire Disability Index)

This tool measures disability by assessing the ability to perform daily activities. Higher scores reflect greater disability in daily tasks.

CRP (C-reactive Protein)

CRP is a protein that rises during inflammation. Higher levels indicate more inflammation.

NRS (Numerical Rating Scale)

The NRS is used to rate symptom severity from 0 (no pain) to 10 (worst pain). Higher scores indicate greater severity.

PGA (Patient Global Assessment)

The PGA reflects the patient's overall perception of their disease activity. Higher scores indicate worse disease perception.

RESULTS

Study participants

After inclusion and exclusion criteria were met 101 Ax-SpA were enrolled in this study.

Table 1: Demographic characteristics of study subjects (n=101)

Characteristics	Frequency (%)
Age, mean ± SD (years)	33.8±10.41
Gender	
Male	66 (65.3)
Female	35 (34.7)
Marital status	
Married	70 (69.3)
Unmarried	30 (29.7)
Others	1 (1)
Education	
*Up to SSC	59 (58.4)
HSC and above	42 (41.6)
Occupation	
Housewife	23 (22.8)
Service	33 (32.7)
Student	16 (15.8)
Unemployed	13 (12.9)
Others	16 (15.8)
Living area	
Urban	51 (50.5)
Rural	50 (49.5)
Tobacco use (n=20)	
Cigarette	19 (18.8)
Other form	1 (1.0)

*Up to SSC- Illiterate, up to V, up to VIII, SSC

HSC- higher secondary certificate, IBD- Inflammatory bowel disease, PsA- Psoriatic arthritis, LBP- Low back pain, SpA- Spondyloarthritis, SSC- secondary school certificate'

Demographic Characteristics of Study Participants

A total of 101 participants in the study had a mean age of 33.8 ± 10.41 years. The majority of participants were male (65.3%) compared to females (34.7%). Most were married (69.3%). Regarding educational background, 58.4% had education up to Secondary School Certificate (SSC), while 41.6% had completed higher secondary education (HSC) or above. The occupational status varied, with 32.7% employed in service jobs, 22.8% being housewives, and 15.8% being students. A similar distribution was observed for rural and urban living areas, with 50.5% residing in urban areas and 49.5% in rural areas. Tobacco use was reported by 18.8% of participants in the form of cigarettes, while 1% used other forms of tobacco (Table 1).

Table 2: Baseline clinical characteristics of study subjects (n=101)

Characteristics	Frequency (%)
Family history SpA	
Positive	30 (29.7)
Negative	71 (70.3)

BMI (kg/m2)	23.97±4.63
Disease duration (years)	8.56±5.77
Age at diagnosis SpA (years)	30.74±9.58
First symptom onset	
LBP	44 (43.6)
Alternate buttock pain	6 (5.9)
Lower limb arthritis	36 (35.6)
Upper limb arthritis	4 (4.0)
Enthesitis	10 (9.9)
Cervical pain	1(1)
Comorbidities (n=60)	
DM	11 (10.9)
HTN	9 (8.9)
Hypothyroid	4 (4.0)
IHD	2 (2.0)
Dyslipidemia	26 (25.7)
Others	8 (8.0)
Gap from work during disease (months)	4.3±6.5
History of Uveitis	3 (3.0)

Ax-SpA- axial spondyloarthritis, BMI- Body mass index, DM- Diabetes Mellitus, HLA- human leukocyte antigens, HTN- Hypertension, IDA- Iron deficiency anemia, IHD- ischemic heart disease.

Clinical Characteristics of Study Participants

In the study, 29.7% of participants had a positive family history of spondyloarthritis (SpA). The average BMI was 23.97 kg/m², with a mean disease duration of 8.56 years and an average age at diagnosis of 30.74 years. Low back pain (43.6%) was the most common symptom. Comorbidities included dyslipidemia (25.7%) and diabetes (10.9%). Participants had an average work absence of 4.3 months, and 3.0% reported a history of uveitis (Table2).

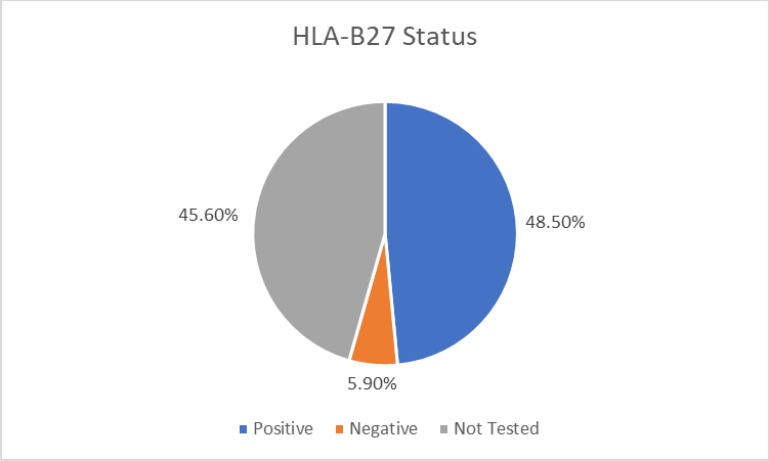

Figure 1: HLA-B27 Status of Study Participants

HLA-B27 Status of Study Participants

The distribution of HLA-B27 status among the study participants revealed that 49 individuals (48.5%) tested positive for HLA-B27, while 6 individuals (5.9%) tested negative. The majority of participants 46 (45.6%) did not undergo testing for HLA-B27. This suggests a high proportion of participants with available data were HLA-B27 positive (Figure 1).

Table 3: Baseline laboratory, disease activity and quality of life characteristics of disease parameters of patients (n=101)

Variables	**Mean±SD**
CRP	37.54±42.32
ESR	47.09±36.51
PGA	7.34±0.97
ASDAS CRP	4.25±0.78

ASDAS ESR	4.11±0.87
ASQoL	15.5±2.56
B- HAQDAI Total	1.88±0.44

ASDAS CRP= Ankylosing spondylitis Disease Activity score C-reactive Protein, ASDAS ESR= Ankylosing spondylitis Disease Activity score-Erythrocyte Sedimentation Rate, ASQoL= Ankylosing spondylitis Quality of Life, B- HAQDAI= Bangla version of Health Assessment Questionnaire- Disability Index, CRP= C-reactive Protein, NRS= Numerical rating scale, PGA= Patient Global Assessment, SD=Standard deviation.

Baseline Laboratory, Disease Activity, and Quality of Life Characteristics

The study participants exhibited high disease activity and functional impairments. Baseline laboratory results showed a mean C-reactive protein (CRP) level of 37.54 ± 42.32 mg/L and an erythrocyte sedimentation rate (ESR) of 47.09 ± 36.51 mm/hr. Disease activity was reflected in the Patient Global Assessment (PGA) score of 7.34 ± 0.97, and disease indices like ASDAS (CRP: 4.25 ± 0.78, ESR: 4.11 ± 0.87). Quality of life, assessed by ASQoL (15.5 ± 2.56) and B-HAQDAI (1.88 ± 0.44), highlighted moderate to severe functional and mental health challenges in the participants (Table 3).

Table 4: Comorbidities in Patients with Axial Spondyloarthritis

Comorbidity	Frequency (%)
Diabetes Mellitus (DM)	9 (18.8)
Hypertension (HTN)	9 (18.8)
Hypothyroidism	4 (8.3)
Ischemic Heart Disease (IHD)	2 (4.2)
Dyslipidemia	22 (45.8)

Comorbidities in Patients with Axial Spondyloarthritis

Table 4 presents the prevalence of comorbidities among patients diagnosed with axial spondyloarthritis. Dyslipidemia was the most commonly observed comorbidity, affecting 22 patients (45.8%), indicating a high prevalence of lipid metabolism disorders in this patient population. This finding suggests that lipid profile monitoring and cardiovascular risk assessment should be prioritized in these patients. Both Diabetes Mellitus (DM) and Hypertension (HTN) were observed in 9 patients (18.8%) each. These metabolic and cardiovascular conditions are frequently associated with chronic inflammatory diseases and may contribute to an increased risk of cardiovascular complications in patients with axial spondyloarthritis. Hypothyroidism was detected in 4 patients (8.3%), which, although less common, highlights the potential endocrine involvement in these patients. Additionally, Ischemic Heart Disease (IHD) was identified in 2 patients (4.2%), emphasizing the need for cardiovascular risk evaluation in individuals with axial spondyloarthritis.

DISCUSSION

This study provides valuable insights into the demographic, clinical, and disease-related characteristics of Ax-SpA patients. Among the 101 participants who completed the study, the mean age was 33.8 years, with a male predominance, consistent with the known higher prevalence of Ax-SpA in males. The majority of participants were married and had an educational background up to the Secondary School Certificate. The nearly equal distribution of rural and urban living areas highlights the widespread impact of Ax-SpA across different settings. Tobacco use is a notable risk factor that may exacerbate disease progression and comorbidities. Clinically, the mean disease duration was 8.56 years, with low back pain being the most common initial symptom, followed by lower limb arthritis. The presence of comorbidities such as dyslipidemia, diabetes, and hypertension underscores the need for comprehensive management strategies addressing both Ax-SpA and associated conditions.[11] The mean BMI of 23.97 kg/m^2 suggests that most participants were in the overweight range, though individual variations may influence disease outcomes.[13] Around half of the participants tested positive for HLA-B27, a key genetic marker for Ax-SpA, while another half did not undergo testing, indicating potential gaps in diagnostic evaluation. The disease activity indices revealed high levels of disease activity and functional impairment. These findings are consistent with the elevated CRP (37.54 mg/L) and ESR (47.09 mm/hr) levels, reflecting active inflammation and with moderate to severe difficulties in performing daily activities shown by B_HAQDAI Total 1.88±0.44.[14] The mean ASQoL score of 15.5 indicates moderate impairment in quality of life. These results highlight the significant physical and mental health challenges faced by Ax-SpA patients, emphasizing the need for targeted interventions to improve disease control and quality of life.[9]

Early diagnosis of axial spondyloarthritis (Ax-SpA) is crucial for preventing irreversible damage, as delayed diagnosis is common because of nonspecific symptoms like low back pain and peripheral arthritis. The mean age of the participants was 33.8±10.41, the mean age at the diagnosis of the disease was 30.74±9.58 and on

average participants had been living with the disease for 8.56±5.77. These results suggest that the disease is often diagnosed late as there is a gap between the age of diagnosis and the current age of the participants. Radiographic changes often take years to appear, making early identification essential. Approximately 48.5% of participants tested positive for HLA-B27, highlighting its genetic association with Ax-SpA and suggesting its role in diagnostic pathways.[15-18] The delay highlights the need for earlier detection and intervention. This study highlighted prevalent comorbidities like dyslipidemia, diabetes, and hypertension in Ax-SpA patients, increasing cardiovascular risk. With 10-20% also having inflammatory bowel disease, a multidisciplinary approach involving rheumatologists, cardiologists, and endocrinologists is crucial for effective management.[19-24] The study highlighted that Ax-SpA with high disease activity scores was associated with significant functional impairment and reduced quality of life.[25-32] It also resulted in regular absences from daily work. Advances in treatment, particularly biologics like TNF, JAKi and IL-17 inhibitors, have significantly improved disease management. Early initiation of biologics in patients with high disease activity can prevent long-term disability. Non-pharmacological interventions, such as physical therapy and exercise, are essential to improving mobility, reducing pain, and enhancing overall well-being.[33-40] This study has several strengths, including a comprehensive analysis of demographic, clinical, laboratory, and quality-of-life characteristics of Ax-SpA patients. The inclusion of participants from both rural and urban areas highlights the widespread impact of Ax-SpA. It also emphasizes the prevalence of comorbidities like dyslipidemia, diabetes, and hypertension, critical for disease management. The inclusion of HLA-B27 data offers insights into genetic prevalence, while the exploration of psychosocial impacts underscores the need for holistic care addressing both physical and mental health.

CONCLUSION

This study provides valuable insights into the demographic, clinical, and quality-of-life characteristics of Ax-SpA patients, highlighting the significant burden of the disease. The findings emphasize the importance of early diagnosis, holistic disease management, and addressing comorbidities to improve patient outcomes. However, limitations such as small sample size high dropout rate, and lack of longitudinal data restrict the generalizability of the findings. Future research should focus on expanding HLA-B27 testing, and explore the long-term impact of Ax-SpA on both physical and mental health. By addressing these gaps, healthcare providers can develop more effective, patient-centered strategies to manage Ax-SpA and enhancing patients quality of life.

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