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Original Article

Prevalence of Inflammatory Backache and Radiographic Axial Spondyloarthritis Among Patients with Musculoskeletal Backache in Outdoor Patients of Rheumatology Department at PIMS Hospital

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ABSTRACT

Objective: To assess inflammatory back ache and radiographic axial spondylarthritis among patients with musculoskeletal backache in a single-center sample from Pakistan.

Study Design: Analytical cross-sectional study.

Place and Duration of Study: Department of Rheumatology, Pakistan Institute of Medical Sciences (PIMS), Islamabad, Pakistan, from Apr to Sep 2023.

Methodology: Patients visiting the Rheumatology outpatient department (OPD), with backache, were assessed for inflammatory backache using the Assessment of Spondyloarthritis International Society (ASAS) criteria to determine the occurrence of spondyloarthritis. Pain levels were recorded on a Visual Analogue Scale (VAS) and sacroiliitis on imaging was also recorded as per the modified New York criteria.

Results: Out of a sample of 74 patients, 48(64.90%) were diagnosed as having inflammatory backache. Patients with inflammatory backache had higher pain levels (median = 6.00, IQR = 1.00 VAS) and more frequently reported higher C-reactive protein (CRP) levels (n=12, 92.30%) and greater pain levels, as compared to those without inflammatory backache (median = 5.00, IQR = 2.00 VAS; higher CRP n = 1, 7.70%).

Conclusion: Inflammatory backache was highly frequent among patients with backache and associated clinical features were more frequently present among patients with inflammatory backache.

Keywords: Inflammatory backache, Musculoskeletal Backache, Radiographic Axial Spondyloarthritis, Sacroiliitis.

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INTRODUCTION

According to the World Health Organization (WHO), about 20-30% of the population is affected by chronic musculoskeletal pain,[1] which refers to short-term and persistent discomfort impacting bones, muscles, ligaments, tendons, and nerves whereas inflammatory back pain (IBP) is a persistent form of pain specifically centered around the axial spine and sacroiliac joints, distinguished from mechanical back pain by distinct diagnostic characteristics.[2] IBP is considered as a screening test for patients suffering from chronic back pain, where a positive diagnosis of IBP increases the probability of axial spondyloarthritis (axSpA) by around 2-8%.[3] IBP is usually the first main symptom of axial spondyloarthritis,[4] which is a type of inflammatory arthritis, resulting in the inflammation of the sacroiliac joints and the axial spine. Treatment options like Tumor necrosis factor (TNF) antagonists demonstrate higher efficacy.[4] According to ASAS guidelines, axial spondyloarthritis is defined as a chronic inflammatory rheumatic musculoskeletal disease with more involvement of the axial skeleton.[5] axSpA comprises of two different types on the basis of presence or absence of radiographic features, termed as radiographic axSpA (r-axSpA) and non-radiographic axSpA (nr-axSpA) and patients with r-axSpA and nr-axSpA exhibit largely similar clinical presentations, disease burden, including occurrence of comorbidities, treatment administered, and response to treatment.[6] According to the Calin criteria, the prevalence of IBP in axial spondyloarthritis (axSpA) is approximately 6% in America.[7] In the United Kingdom, the prevalence of IBP has been documented to be around 2% according to the ASAS criteria.[8] In South China, the prevalence of IBP was 2.94% and axSpA was 0.34%.[9] A local study reported a frequency of 6.70% and 1.00% of patients with IBP and r-axSpA respectively.[10] Given the limited literature on rheumatic disorders, especially within Pakistan, the primary objective of this study was to assess the prevalence of IBP and r-axSpA among individuals experiencing musculoskeletal backache.

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METHODOLOGY

This analytical cross-sectional study was carried out at the Department of Rheumatology, Pakistan Institute of Medical Sciences Hospital (PIMS), Islamabad, Pakistan, from April to September 2023. Ethical approval for the study was obtained from the Ethics Review Board of PIMS Hospital under reference number F.3-1/2023. Non-probability sampling technique was used after World Health Organisation (WHO) sample size calculator was used to determine sample size estimation using the formula for estimating a population proportion, a 5% level of significance with 90% power, and anticipated population proportions of 26.98% (axial spondylarthritis),9 and 11.95% (other inflammatory back pain)10, a sample of 74 was calculated.

Inclusion Criteria: To be eligible for inclusion in the study, individuals attending the Outpatient Department of Rheumatology underwent screening for the presence of backache. Patients from both genders, 18 to 45 years of age, with history of chronic back pain for more than 3 months, were included in the study. Back pain was defined as a history of pain, stiffness, and limited movement in the neck, upper and lower back, along with painful stiffness of the shoulder and pelvic girdle muscles, persisting for a minimum of 3 months.

Exclusion Criteria: Individuals who declined to participate in the study, refused to provide a blood sample, had other autoimmune conditions like rheumatoid arthritis or systemic lupus erythematosus, were pregnant, experienced backache along with a neurological deficit, had backache attributed to trauma, or had a previous diagnosis of any type of SpA (such as ankylosing spondylitis, psoriatic arthritis, or reactive arthritis) were excluded from the study.

Among these patients, the presence of inflammatory backache was assessed using the ASAS criteria for Inflammatory Back Pain. Comprising five elements: (1) the onset being insidious; (2) age at the onset being less than 40 years; (3) improvement occurring with exercise; (4) no alleviation with rest; and (5) experiencing nocturnal pain that improves upon waking with the presence of IBP being determined if four out of these five features were identified.[11] Each participant in the study also assessed their back pain using a numeric scale ranging from 1 to 10, yielding a Visual Analog Scale (VAS) score where the pain was described using these VAS units. The ASAS classification criteria for Axial Spondyloarthritis involve the presence of sacroiliitis on imaging plus at least one other SpA feature or the combination of HLA-B27 positivity and at least two other SpA features. A positive indication of sacroiliitis on imaging was defined by the presence of acute inflammation on MRI or definitive radiographic sacroiliitis as per the modified New York Criteria. Individuals experiencing inflammatory back pain underwent additional evaluation for Spondyloarthritis (SpA), which included a comprehensive medical history. This examination focused on all features associated with SpA as defined by the ASAS classification criteria for axial SpA. These features encompassed family history, peripheral and extra-muscular manifestations of axial SpA, such as uveitis, dactylitis, enthesitis, a history of inflammatory bowel disease, psoriasis, peripheral arthritis, and a positive response to non-steroidal anti-inflammatory drugs.[12] Patients' spine examination was then carried out including modified Schober's test, tragus to wall, occiput to wall, finger to floor and chest expansion. Examination also included assessment of skin and nails for psoriasis and tender and swollen peripheral joints.[11] Anteroposterior pelvis X-ray for sacroiliac (SI) joints was carried out, for classifying SpA into radiological and non-radiological axial SpA using Modified New York Criteria.[13] X-rays were evaluated, and those reporting bilateral grade 2 or unilateral grade 3 or higher were deemed to meet the criteria for radiographic axial Spondyloarthritis (SpA). Inflammatory markers, including C-reactive protein (CRP), were examined. However, due to financial constraints and the unavailability of MRI Short Tau Inversion Recovery (STIR) films and HLA-B27 testing, these specific tests were not conducted. The recorded data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) 26.00 for statistical examination. For quantitative variables, such as age, mean and standard deviation were computed and ordinal variable of pain, which was recorded on a VAS, median was calculated. Qualitative variables like gender, the frequency of inflammatory back pain, the occurrence of high CRP levels and radiographic axial spondyloarthritis were expressed in frequencies or percentages. The chi-squared test was employed to compare the frequency distribution of categorical variables between patients with and without inflammatory backache. Additionally, the Mann-Whitney-U test was utilized to compare the pain VAS between the two groups.

RESULTS

This study included a total of 74 patients, with 48 (64.9%) of them being diagnosed with inflammatory backache according to the ASAS criteria. The characteristics of these 48 patients have been illustrated in Table-I. Moreover, comparisons of different variables have been made between patients with and without inflammatory backache (Table-I).

Table-I: Frequency of Characteristics of Patients with and without Inflammatory Backache (n = 74)

Variable		ASAS Classification Criteria		*p*-value
		Inflammatory Backache (n=48)	No Inflammatory Backache (n=26)	
Gender	Male	23(71.90%)	9(28.10%)	0.33
	Female	25(59.50%)	17(40.50%)	
CRP	Yes	12(92.30%)	1(7.70%)	0.03*
	No	36(59.00%)	25(41.00%)	
Family History	Yes	13(92.90%)	1(7.10%)	0.02*
	No	35(58.30%)	25(41.70%)	
Uveitis	Yes	1(100.00%)	0(0.00%)	1.00*
	No	47(64.40%)	26(35.30%)	
Dactylitis	Yes	0(0.00%)	0(0.00%)	---
	No	48(64.90%)	26(35.10%)	
Enthesitis	Yes	14(93.30%)	1(6.70%)	0.01
	No	34(57.60%)	25(42.40%)	
History of Inflammatory Bowel Disease	Yes	2(100.00%)	0(0.00%)	0.54*
	No	46(63.90%)	26(36.10%)	
Psoriasis	Yes	1(100.00%)	0(0.00%)	1.0*
	No	47(64.4.0%)	26(35.60%)	
Peripheral Arthritis	Yes	5(100.00%)	0(0.00%)	0.16*
	No	43(62.30%)	26(37.70%)	
Good Response to NSAIDs	Yes	39(78.00%)	11(22.00%)	0.00
	No	9(37.50%)	15(62.50%)	
Pain VAS (Median, IQR)		6 (1.00)	5(2.00)	0.00
Modified Schober's Test	Yes	11(91.70%)	1(8.30%)	0.05*
	No	37(59.70%)	25(40.30%)	
Tragus to Wall	Yes	1(100.00%)	0(0.00%)	1.00*
	No	47(64.40%)	26(35.60%)	
Occiput to Wall	Yes	1(100.00%)	0(0.00%)	1.00
	No	47(64.40%)	26(35.60%)	
Finger to Floor/ Lateral Flexion	Yes	8(88.90%)	1(11.10%)	0.15
	No	40(61.50%)	25(38.50%)	
Chest Expansion	Yes	0(0.00%)	0(0.00%)	---
	No	48(64.90%)	26(35.10%)	
Assessment of Skin & Nails of Psoriasis	Yes	1(100.00%)	0(0.00%)	1.00
	No	47(64.40%)	26(35.60%)	
Tender & Swollen Peripheral Joints	Yes	6(100.00%)	0(0.00%)	0.09*
	No	42(61.80%)	26(38.20%)	
Low Back Pain & Stiffness	Yes	48(64.90%)	26(35.10%)	---
	No	0(0.00%)	0(0.00%)	
Limitation of Lumbar Spine Motion	Yes	10(90.90%)	1(9.10%)	0.08*
	No	38(60.30%)	25(39.70%)	
Limited Chest Expansion	Yes	0(0.00%)	0(0.00%)	---
	No	48(64.90%)	26(35.10%)	

**CRP: C-reactive protein, VAS: Visual Analogue Scale, NSAID: Nonsteroidal Anti-Inflammatory Drug, IQR: Inter Quartile Range*

The frequency of patients with different grades of radiographic sacroiliitis has been illustrated in Table-II. A total of 17(23.00%) patients were reported to have sacroiliitis.

DISCUSSION

Our study focused on generating epidemiological data specific to the local population due to the paucity of literature on rheumatic disorders, particularly spondyloarthritis spectrum and inflammatory back pain in this region. Studies from different regions around the world show interesting variations in comparison to our findings. In our study population, the frequency of inflammatory back pain as indicated by ASAS criteria was 64.90%, significantly higher than the reported 7.70% prevalence in the United Kingdom based on ASAS criteria.[14] This discrepancy may be attributed to genetic, environmental, or demographic differences between populations.[15] Furthermore, our study's frequency aligns more closely with the reported frequency of 6.70% from Pakistan.[10] This consistency underscores the importance of region-specific epidemiological data for understanding the burden of rheumatic disorders. Moreover, we find it intriguing that the prevalence of IBP using ASAS criteria in our study population is comparable to findings in a low-income population in Fortaleza, Brazil, where 14.3% of individuals fulfilled the ASAS IBP criteria.[14] This similarity in occurrence across diverse socioeconomic contexts suggests the robustness and applicability of ASAS criteria in identifying inflammatory back pain, irrespective of income and literacy levels. Our study found a frequency of 23.00% for radiographic sacroiliitis among patients with musculoskeletal backache. This aligns with the reported prevalence of 26.10% for peripheral spondyloarthritis in a study from Japan.[15] Patients with inflammatory backache showed higher prevalence of elevated C-reactive protein (CRP) levels, family history, enthesitis, and a positive response to non-steroidal anti-inflammatory drugs (NSAIDs) in our study. These findings align with existing literature emphasizing the importance of these factors in the diagnosis and classification of axSpA.[16] Although not statistically significant (p=0.33), the occurrence of inflammatory backache in our study appears to be higher among males (71.90%) compared to females (59.50%) which aligns with some existing literature suggesting a potential gender-based variation in the presentation of inflammatory back pain,[15] with women experiencing longer delays in the diagnosis of axSpA.[17,18]

Table-II: Frequency of Different Grades of Radiographic Sacroiliitis (n = 17)

Grade of Radiographic Sacroiliitis	n(%)
0	57(77.00%)
II	3(4.10%)
III	13(17.60%)
IV	1(1.40%)

LIMITATIONS OF STUDY

The current study had limitations of using non-probability sampling, which may have introduced selection bias and the lack of certain diagnostic tests, such as MRI Short Tau Inversion Recovery (STIR) films and HLA-B27 testing, due to financial constraints of patients, may have impacted the completeness of the diagnostic criteria. Future research should focus on larger, more diverse samples and incorporate a broader array of diagnostic tools to enhance the generalizability of findings.

CONCLUSION

Inflammatory backache was highly frequent in this study, with nearly two-thirds of patients meeting the ASAS criteria for spondyloarthritis. The significantly higher pain scores and elevated CRP levels in these patients underscore the importance of early differentiation from non-inflammatory back pain. Routine application of standardized diagnostic criteria in rheumatology outpatient settings may facilitate timely diagnosis and help reduce long-term disability in this population.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

G & UR: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

SZ & TMUP: Conception, data analysis, drafting the manuscript, approval of the final version to be published.

MSK & SM: Data acquisition, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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