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Original Research

Evaluation of Sacroiliitis on MRI in clinically Suspected Cases of Ankylosing Spondylitis

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ABSTRACT:

Background: This study aimed to evaluate Sacroiliitis on MRI in clinically Suspected Cases of Ankylosing Spondylitis. **Material and methods:** It was a hospital-based, cross-sectional, comparative, descriptive, prospective study that included 50 subjects. Patients who were clinically suspected of having symptoms related to sacroiliitis had been included in the study. Those who had tumour or tumour-like conditions, congenital spinal anomalies, and those who had absolute contraindications to MRI were excluded from the study. Siemens 1.5 Tesla MRI system "Magnetom Essenza" with Tim + Dot technology machine was used for the study. All the collected data were entered in Microsoft Excel Sheet and then transferred to EPI-INFO. software for analysis. Quantitative data were presented as frequency and Percentages. **Results:** On MRI, most common finding was mild Articular irregularity 36% whereas 28% had moderate articular irregularity and 2% had severe articular irregularity, while 34% did not show any findings on MR imaging. Joint Space Narrowing among study subjects by using MR Imaging was done. On MR imaging most common observation was 38% did not show any Joint Space Narrowing, followed by 34% had mild Joint Space Narrowing, 26% had moderate Joint Space Narrowing, and one patient presented with severe Joint Space Narrowing. All the study subjects were examined for bony erosion which is suggestive of inflammatory changes. On MR imaging most common finding was mild erosions 36% whereas 28% had moderate level erosions and one patient presented with severe erosion while 34% did not show any findings on MR imaging. **Conclusion:** Ankylosing Spondylitis is a common problem in the growing population, affecting patients with a gap of 5-8 years between the onset of symptoms & establishment of diagnosis using conventional radiography. In this study, MRI detected more cases of AS as compared to X–ray that too on an earlier stage of disease.

Keywords: MRI, Ankylosing Spondylitis, Sacroiliitis.

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INTRODUCTION

Spondyloarthritis (SpA) belongs to a group of inflammatory rheumatic diseases often associated with human leukocyte antigen HLA-B27 and presenting with enthesitis, osteitis and arthritis. Axial skeleton manifestations are predominant in axial SpA and less frequently observed in psoriatic arthritis, inflammatory bowel disease associated with SpA, reactive SpA and undifferentiated SpA.1-4 Patients with structural damage in sacroiliac joints and those without (non-radiographic axSpA) are both included in the term "axSpA." (radiographic axSpA).5,6 Sacroiliac joint imaging is a crucial step in the diagnosis of axSpA.7,8 The illness often strikes in the second or third decade and has a notable 3:1 male to female prevalence.9 With an estimated 1.3% prevalence in the Indian population, AS poses a serious health risk to the neighbourhood.10 The most productive years of life— late adolescence and early adulthood—are when symptoms usually start to manifest. The condition causes ongoing pain, stiffness, exhaustion, and a gradual loss of spinal movement and function, which lowers quality of life if it goes misdiagnosed or is treated insufficiently. The duration between the start of symptoms and the time of diagnosis in AS has been observed to be 8-11 years,

which is an unacceptably long delay.11 Sacroiliitis, inflammation of sacroiliac joints (SIJ), is a primary manifestation of Ankylosing Spondylitis and may be seen in many other rheumatic and non-rheumatic disorders as well. It results in chronic back pain, and loss of man hours. It has a direct impact on the individual as well has a larger implication for the society. Early detection and treatment prevent long term morbidity. Therefore, early detection is mandatory for initiating correct treatment.12

MRI is the most accurate modality of diagnosis considering its multi planar imaging capabilities coupled with the absence of ionizing radiation. The advantage of MRI is that it can differentiate active disease from inactive disease also. It is highly sensitive and can detect sacroiliitis even when plain radiographs are normal.13

MRI is also useful to estimate the degree of activity, which can be beneficial in monitoring the effects of pharmacological treatment. It has the ability to image cartilage

changes and marrow edema directly and it has been found superior to CT in detection of cartilage, bone erosion and sub chondral sclerosis. MRI is however contraindicated in presence of metallic implants in the body like cardiac pacemakers, aneurysm clips and metallic splinters. MR study is expensive, not easily available and time consuming.13 The present study assessed the role of MRI in early diagnosis of Sacroiliitis and evaluation of bone destruction in patients of ankylosing spondylitis.

Material and methods

It was a hospital-based, cross-sectional, comparative, descriptive, prospective study that included 50 subjects. Patients who were clinically suspected of having symptoms related to sacroiliitis had been included in the study. Those who had tumour or tumour-like conditions, congenital spinal anomalies, and those who had absolute contraindications to MRI were excluded from the study. Siemens 1.5 Tesla MRI system "Magnetom Essenza" with Tim + Dot technology machine was used for the study. All the collected data were entered in Microsoft Excel Sheet and then transferred to EPI-INFO. software for analysis. Quantitative data were presented as frequency and Percentages.

Results

All the study subjects underwent Magnetic Resonance Imaging for diagnosing Ankylosing Spondylitis. On MRI, most common finding was mild Articular irregularity 36% whereas 28% had moderate articular irregularity and 2% had severe articular irregularity, while 34% did not show any findings on MR imaging. All the study subjects were examined for bony erosion which is suggestive of inflammatory changes. On MR imaging most common finding was mild erosions 36% whereas 28% had moderate level erosions and one patient presented with severe erosion while 34% did not show any findings on MR imaging. Joint Space Narrowing among study subjects by using MR Imaging was done.

Articular Irregularity Findings	**MRI Number (%)**
Absent	17 (34%)
Mild	18 (36%)
Moderate	14 (28%)
Severe	01 (02%)
Total	50 (100%)

Erosion	**MRI Number (%)**
Absent	17 (34%)
Mild	18 (36%)
Moderate	14 (28%)
Severe	01 (02%)
Total	50 (100%)

Joint Space Narrowing	**MRI Number (%)**
Absent	19 (38%)
Mild	17 (34%)
Moderate	13 (26%)
Severe	01 (02%)
Total	50 (100%)

On MR imaging most common observation was 38% did not show any Joint Space Narrowing, followed by 34% had mild Joint Space Narrowing, 26% had moderate Joint Space Narrowing, and one patient presented with severe Joint Space Narrowing.

Discussion

Clinical assessment of early sacroiliitis is often difficult, and the diagnosis frequently depends on imaging evaluation. Plain radiography remains the most widely accepted and available initial screening method. However, there is significant intra- and interobserver variation in the interpretation of plain radiographs 14. Erosions and joint space alteration in early sacroiliitis may be challenging to assess on radiographs. Symptoms of sacroiliitis often occur 1–9 years before there are manifest changes on radiography. Cross-sectional imaging, therefore, plays a vital role in the identification of abnormalities of the SIJs in early seronegative SpA 15. In our study, 50 patients of clinically presumed inflammatory backache between 18 – 57 years of age were evaluated. The majority of the study subjects belonged to 18– 25 years age group (42%) followed by 26 – 35 years (34%). The mean age of the study subjects was 28.92 years. This was similar to a study done by Prakash S et al, where the mean age of onset 21.2 years. 16 Out of the total study subjects, 41 (82%) were males and 9 (18%) were females. The male: female ratio in this study was 4.55:1. In a study by Adelsmayr G et al, males outnumbered females with male to female ratio of 3:1.17

We observed that all 50 patients presented with the complaint of low back pain 100% (n=50) and 43 patients 86% presented with morning stiffness in this study. Similar results were reported by Karoli Y et al, in their study all the patients (100%) had a history of inflammatory back pain.18 The impact of the inflammatory disease can be variable resulting in chronic pain and debility hence early diagnosis and treatment are important. Serum biomarkers have been used in assessing disease activity, treatment response, and as predictors of radiographic severity.19,20 We noted that elevated TLC, ESR, CRP were seen in about 74%, 78% & 78% of patients with AS, implying inflammatory activity was present.67 which is similar to Nallasivan S et al 21 and Karoli Y18 et al who reported elevated CRP, ESR , neutrophil lymphocyte ratio in their study. The main radiographic signs observed in this study are bone erosions (n = 21), joint space alterations (n = 17), and ankylosis (n = 14). MRI is being used increasingly to diagnose radiographic AS while a separate group of patients has been classified as non - radiographic AS. [7] In the present set of patients, the MR Imaging showed higher sensitivity for detecting minimal bone erosions and joint space narrowing, articular irregularity, and ankylosis.

Conclusion

Ankylosing Spondylitis is a common problem in the growing population, affecting patients with a gap of 5-8 years between the onset of symptoms & establishment of diagnosis using conventional radiography. In this study, MRI detected more cases of AS as compared to X– ray that too on an earlier stage of disease.

References

1. Braunwald EFA, Kasper DL, Hauser SL, Longo DL, Jameson JL (eds). Disorders of the immune system, connective tissue, and joints. Harrison's principles of internal medicine, 15th ed. McGraw-Hill, New York
2. Dougados M, Baeten D (2011) Spondyloarthritis. Lancet 377(9783):2127-37.
3. Braun J, Sieper J (2007) Ankylosing spondylitis. Lancet 369(9570):1379-90.
4. Rudwaleit M, van der Heijde D, Landewe R et al (2009) The development of Assessment of SpondyloArthritis international Society classification criteria for axial spondyloarthritis (part II): validation and final selection. Ann Rheum Dis 68(6):777–783.
5. Sieper J and Poddubnyy D. Axial spondyloarthritis. Lancet 2017; 390: 73–84.
6. Rudwaleit M, van der Heijde D, Landewé R, et al. The development of Assessment of SpondyloArthritis international Society classification criteria for axial spondyloarthritis (part II): validation and final selection. Ann Rheum Dis 2009; 68: 777–783.
7. Sieper J, Rudwaleit M, Baraliakos X, et al. The Assessment of SpondyloArthritis international Society (ASAS) handbook: a guide to assess spondyloarthritis. Ann Rheum Dis 2009;68(Suppl. 2): ii1–ii44.
8. Poddubnyy D. Classification vs diagnostic criteria: the challenge of diagnosing axial spondyloarthritis. Rheumatology 2020;59(4): iv6–iv17.
9. Rudwaleit M, van der Heijde D, Khan MA, Braun J, Sieper J. How to diagnose axial spondyloarthritis early? Ann Rheum Dis 2004;63:535-43.
10. Dean LE, Jones GT, MacDonald AG, Downham C, Sturrock RD, Macfarlane GJ. Global prevalence of ankylosing spondylitis. Rheumatology (Oxford) 2014;53:650-7.
11. Feldtkeller E, Khan MA, van der Heijde D, van der Linden S, Braun J. Age at disease onset and diagnosis delay in HLA-B27 negative vs. positive patients with ankylosing spondylitis. Rheumatol Int 2003;23:61-6.
12. Slobodin G, Hussein H, Rosner I, Eshed I. Sacroiliitis - early diagnosis is key. J Inflamm Res. 2018 Sep 10;11:339-344.
13. Tsoi C, Griffith JF, Lee RKL, Wong PCH, Tam LS. Imaging of sacroiliitis: Current status, limitations and pitfalls. Quant Imaging Med Surg. 2019 Feb;9(2):318-335.
14. Forrester DM, Hollingsworth PN, Dawkins RL. Difficulties in the radiographic diagnosis of sacroiliitis. Chin Rheum Dis 1983; 9:323-332.
15. Braun J, Sieper J, Bollow M: Imaging of sacroiliitis. Clin rheumatol 2000:19:51- 7
16. Prakash S, Mehra NK, Bhargava SN, Vaidya MC, Malaviya AN. Ankylosing spondylitis in North India: a clinical and immunogenetic study. Annals of the rheumatic diseases. 1984 Jun 1;43(3):381-5.
17. Adelsmayr, G., Haidmayer, A., Spreizer, C. et al. The value of MRI compared to conventional radiography in

analysing morphologic changes in the spine in axial spondyloarthritis. Insights Imaging 12, 183 (2021).
18. Karoli Y, Avasthi S, Mahapatra S, Karoli R. Clinical profile of ankylosing spondylitis at a teaching hospital. Ann Afr Med 2022;21:204-7
19. Landewé R, van Tubergen A. Clinical tools to assess and monitor spondyloarthritis. Curr Rheumatol Rep 2015; 17:47.
20. Reveille JD. Biomarkers for diagnosis, monitoring of progression, and treatment responses in ankylosing spondylitis and axial spondyloarthritis. Clin Rheumatol 2015; 34: 1009-18.
21. Nallasivan S, Thiyagarajan D, Manivannan A. Prospective study of patients with inflammatory back pain, clinical characteristics and treatment response in ankylosing spondylitis in two centers of rheumatology in South India. Indian J Rheumatology 2022; 17:10-5