



DIAGNOSTIC UTILITY OF MAGNETIC RESONANCE IMAGING IN SERONEGATIVE SPONDYLOARTHROPATHIES: A RADIOLOGICAL PERSPECTIVE

Radio-Diagnosis

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KEYWORDS

Seronegative spondyloarthropathies, SpA, MRI.

INTRODUCTION

- The sero-negative spondyloarthropathies (SpA) comprise a group of interrelated inflammatory arthritides sharing common features. This group comprises disease entities like ankylosing spondylitis, reactive arthritis, psoriatic arthritis, arthritis associated with chronic inflammatory bowel disease (Crohn's disease and ulcerative colitis), and undifferentiated spondyloarthropathies.
- Regardless of subgroup, the main clinical manifestations of seronegative SpA include inflammatory back pain (mainly at night, which worsens with rest and improves with movement) caused by sacroiliitis or inflammatory involvement of the lumbar and/or distal thoracic spine.
- The positivity for class I human histocompatibility leukocyte antigen HLA-B27 is related to a 20-fold increased risk of developing a sero-negative spondyloarthropathies as compared to the general population. The disease is usually seen predominantly in young males, between second and fourth decades of life with onset after 45 years being exceedingly uncommon.
- Involvement of sacroiliac (SI) joints is considered a hallmark for diagnosis of seronegative SpA and is usually the first manifestation of this condition.
- Magnetic resonance imaging (MRI), typically forms the basis for the diagnosis and evaluation of sacroiliitis and is the most relevant imaging method for monitoring of spondyloarthropathies.
- Radiography also plays an important role in the diagnosis of sacroiliitis. However, these diseases are typically not detected until three to seven years after their onset.
- The purpose of this study is to evaluate pattern and characterise MRI findings in patients with seronegative spondyloarthropathy.

Aim And Objective :

Aim-

To evaluate the role of Magnetic Resonance Imaging in diagnosing seronegative spondyloarthropathy.

Objectives-

To evaluate the pattern and characterise MRI findings in patients with seronegative spondyloarthropathy.

MATERIAL AND METHODS :

- The present cross-sectional study was conducted after clearance from Board of Studies, Department of Radiodiagnosis, ABVIMS & DR. RML Hospital
- The sample size was determined to be 70 patients.
- The study subjects were chosen as per the inclusion and exclusion criteria.

Inclusion criteria

- Patient referred to the department of Radio-diagnosis for complaint of pain in hip region or / and backache with or without radiculopathy of 3 or more than 3 months

Exclusion criteria

- All acute traumatic cases.
- Absolute contraindications to MRI such as cardiac pacemakers, ferromagnetic vascular clips, cochlear implants, intra-ocular foreign body etc.
- Patient refusal for MR scan.

The data was entered into the Microsoft excel and the statistical analysis was performed by statistical software SPSS version 25.0.

MRI Sequences:

- Routine fast spin echo sequences for SI & Hip Joints: Coronal & axial STIR sequences and Coronal & axial T1.
- For the Lumbosacral spine: Sag STIR & T1 weighted sequences, Axial T2, T1 & Coronal STIR.
- Other sequences whenever required: Post Contrast T1 weighted fat sat study and sagittal diffusion study were acquired.

RESULTS

Table-1

		Frequency	Percent
Age groups	10-20 years	20	28.6%
	21-30 years	28	40.0%
	31-40 years	14	20.0%
	Above 40 years	8	11.4%
Gender	Male	64	91.4%
	Female	6	8.6%
Comorbidity	No	62	88.6%
	Pott's Spine	8	11.4%

Table 1: Out of the 70 cases, the most common age group in this study was 21-30 years (40.0%) followed by 10-20 years (28.6%) and 31-40 years (20.0%). There were 91.4% males and 8.6% females. Pott's Spine was reported among 8 (22.9%).

Table-2

Clinical features	Frequency	Percent
Spinal Pain	54	77.1%
Hip Pain	44	62.9%
Enthesopathy	12	17.1%
Sacroiliitis	54	77.1%

Table 2: The most common clinical presentation was spinal pain in 54 cases (77.1%) and sacroiliitis was found in 54 cases corresponding to 77.1 % of cases and 12 cases (17.1%) showed enthesopathy of gluteus minimus insertion at greater trochanter of femur.

Table-3

SI Joints Involvement	Frequency	Percent
No	16	22.9%
B/L Asymmetrical	36	51.4%
B/L Symmetrical	14	20%
U/L (Left)	4	5.7%

Table 3: Shows involvement of sacroiliac joints in 54 patients out of 70 patients corresponding to 77.1% and most common pattern of involvement was bilateral asymmetrical in 36 patients i.e, 51.4% patients.

Table-4

SI Joints	Frequency	Percent
Bone marrow edema	54	77.1%
Erosions	22	31.4%
Fatty infiltration	18	25.7%
Ankylosis	8	11.4%
Sclerosis	4	5.7%
Synovitis	20	28.6%

Table 4: Based on the involvement of Sacro-iliac joint, Table 4 summarised that the most common finding encountered in sacro-iliac joint is BMO on sacral & iliac side of the sacroiliac joint in 54 cases (77.1%) out of total 70 cases.

Table-5

Hip Joints	Frequency	Percent
Bone marrow edema	22	31.4%
Erosions	8	11.4%
Synovitis	26	37.1%

Table 5: Based on the involvement of Hip joints, Table 5 summarised that the most common finding encountered is synovitis in 26 cases (37.1%) followed by BMO in 22 cases (31.4%) out of 70 cases.

Table-6

Spine	Frequency	Percent
CVJ Inflammation	8	11.4%
CIL(Corner inflammatory lesion)	8	11.4%
Facet Joint Arthropathy	16	22.9%

Table 6: Based on involvement of spine, the most common findings encountered was facet joint arthropathy in 16 cases (22.9%) out of 70 cases and followed equally by costovertebral joint (CVJ) inflammation and corner inflammatory lesion (CIL) in 8 cases (11.4%) each.

Table-7

S.NO	FINDINGS (SI JOINTS)	NO. OF CASES (n)	PERCENTAGE OF CASES (%)
1.	ACUTE CHANGES		
	Subchondral Bone marrow edema	54	77.1%
	Enthesitis	12	17.1%
	Synovitis	20	28.6%
2.	CHRONIC CHANGES		
	Peri-articular Erosions	22	31.4%
	Fatty Infiltration	18	25.7%
	Bone Sclerosis	4	5.7%
	Bone Bridge/Ankylosis	8	11.4%

Table 7: Most common changes observed in SI joints on MRI is Subchondral BMO i.e, in 54 cases (77.1%) out of 70 cases representing acute change whereas most common chronic changes were in the form of peri-articular erosions, found in 22 cases (31.4%) out of 54 cases.

Table-8 HLA-B-27 distribution

NUMBER OF PATIENT(n=70)	HLA B-27
54(77%)	Positive
16(23%)	Negative

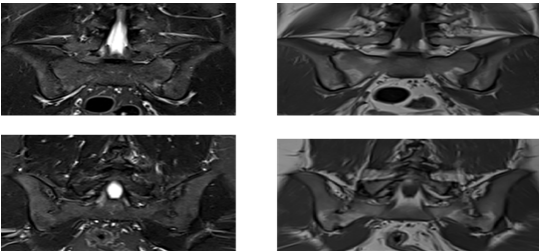
Table 8: HLA B27 associated AS patients presented more severe axial manifestations such as bilateral sacroiliitis, erosions, enthesitis.

Images



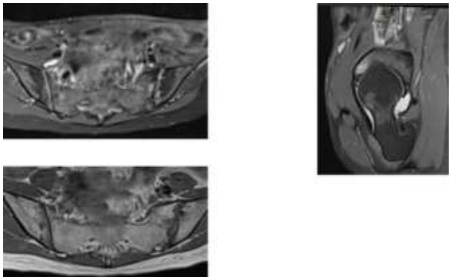
Case-1:-

16 year old boy referred for MRI dorsal spine for back ache. B/L asymmetrical sacroiliitis, few corner inflammatory lesions and multiple B/L facet joint arthropathy in dorsal spine are seen.



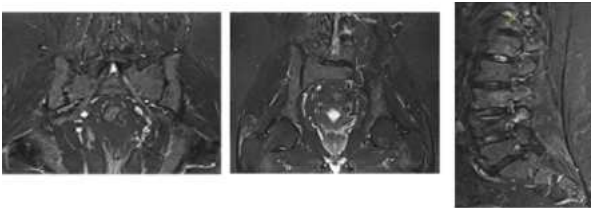
Case-2:-

22 year old boy with acute and chronic changes in B/L sacroiliitis with ankylosis.



Case-3:-

22 year old female with B/L asymmetrical sacroiliitis(both acute and chronic changes), left SI joint subarticular irregularity (erosions) and right hip joint effusion.



Case-4:-

44 year old man with morning stiffness. SI joints are normal appearing, there is enthesopathy and facet joint arthropathy. Patient is HLA-B27 positive.

DISCUSSION

- In present study, SpA is more common in young age group of 21-30 years in 14 cases (40%) out of total 70 cases with male preponderance (91.2%, 64 cases out of 70 cases) and these data results are comparable to the study conducted by Malaviya AN et al¹(2010).
- The MRI findings under evaluation were bone marrow edema (BMO), erosions, fat infiltration, global assessment of sacroiliitis, and ankylosis. BMO was the most prevalent finding among these and was found in 54 cases out of 70 cases, corresponding to 77%.
- Ankylosis was found in only 8 patients out of 70 patients (11.4%). This finding was comparable to the study done by Arnbak B et al² (2012).
- Eshed et al.³ in their study showed MRI to be sensitive for detection of early enthesitis in the appendicular skeleton.
- Lee et al.⁴ also suggested that that recognition of facet joint inflammation has the potential to contribute to understanding of clinical outcomes in AS.
- The subjects with Sacroiliitis had significantly more occurrence of Erosions, Ankylosis, Synovitis, BMO, CVJ inflammation, Facet Joint Arthropathy and Fatty Infiltration.

CONCLUSION

- MRI allows diagnosis of seronegative SpA during the initial stages of the disease and is able to demonstrate features of both acute inflammatory stages and chronic stages.
- Bone marrow edema, erosions, fat infiltrations, global assessment of sacroiliitis, and ankylosis on MRI were found , associated with seronegative SpA.
- Most common clinical presentation was spinal or hip pain and most common MRI findings were sacroiliitis.

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