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SPECTRUM OF IMAGING APPEARANCES ON COMPUTED TOMOGRAPHY AND MAGNETIC RESONANCE IMAGING IN ANKYLOSING SPONDYLITIS IN HLA B27 POSITIVE PATIENTS IN KUMAON REGION

Radiodiagnosis

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ABSTRACT

AIM: To study the spectrum of imaging appearances on CT and MRI in ankylosing spondylitis with HLA B27 positive patients in kumaon region.

Materials and Methods: This was a prospective study conducted in the department of Radiodiagnosis Government Medical College and Dr Susheela Tiwari Memorial Hospital,Haldwani. This study was carried out on 51 cases of ankylosing spondylitis HLA B27 positive cases. C.T. and MRI features were observed on T1weighted, T2weighted and short tau inversion recovery (STIR) sequences. The Spectrum of imaging was studied on the basis of history, clinical evaluation and characteristic radiological features on C.T. and M.R.I.

Results: The disease was most commonly seen in adults with a male predominance in 37 (72.5%) cases. Backache (82.4%) was most common clinical feature followed by inflammation in (80%) cases. Lumbar spine was the most common site in 45 (88%) cases with bilaterally symmetrical involvement in 45 (88%) cases. Subchondral sclerosis was better appreciated in C.T. in 34 (66.6%) cases followed by joint erosion in 23 (45%) cases and joint space alteration in 15(29.4%) cases. Whereas, bone marrow oedema 37 (72.5%) cases was better appreciated in M.R.I followed by articular margin irregularity in 34(66.6%) cases and presence of erosion in 32 (62.7%) cases.

Conclusion: Imaging is an integral part in the early detection of disease and optimizing management of affected patients for their better prognosis. CT and MRI plays a decisive role in the diagnosis and these modalities are also helpful in monitoring the disease.

KEYWORDS

Ankylosing spondylitis(AS), Short tau inversion recovery (STIR), Human leucocyte antigen (HLA)B27

INTRODUCTION:-

Spondyloarthropathy constitute a group of chronic inflammatory rheumatic diseases, which includes reactive arthritis (Reiter syndrome), ankylosing spondylitis, psoriatic arthritis, arthritis or spondylitis associated with inflammatory bowel disease, as well as undifferentiated spondyloarthritis.[1] These afflictions predominantly cause pain, stiffness and affect the axial skeleton.[2] These patients are seronegative for rheumatoid factor and are commonly associated with the presence of human lymphocyte antigen (HLA) B27.[3] They are mostly differentiated on the basis of clinical features and the distribution of abnormal radiographic findings.[4] Sacroiliac joints are involved in majority of cases and sacroilitis being the first manifestation .[5,6] Ankylosing spondylitis causes inflammation leading to severe chronic pain and discomfort due to involvement of spinal joint. In more advanced cases, this inflammation can lead to ankylosis - causing spine to fuse and fix leading to immobility.[7] The spondyloarthropathies share common clinical, radiological, and genetic features that are clearly distinct from inflammatory rheumatic diseases. [8] A finding of sacroiliitis at radiography is the classic feature of axial spondyloarthropathy. [9]

AIM:- To study the spectrum of imaging appearances on CT and MRI in ankylosing spondylitis patients with HLA B27 positive status in kumaon region.

OBJECTIVES:-

1. To study the imaging appearences of ankylosing spondylitis with computed tomography.
2. To study the imaging appearences of ankylosing spondylitis with magnetic resonace imaging
3. The study of the inflammatory changes and bony changes of sacroiliac joint on magnetic resonance imaging and computed tomography.

MATERIALS AND METHOD:- The study was carried out on a prospective basis in the department of Radiodiagnosis Government Medical College and Dr Susheela Tiwari Memorial Hospital, Haldwani. The period of study was one year, from November 2017 to October 2018. Total 51 patients were included in the study. A detailed history, clinical examination and lab investigations were done. MRI examination was conducted using a Siemens Magnatom 1.5 Tesla MRI machine using abdominal surface coils and CT examination was conducted with 16 slice MDCT Siemens machine. Non-contrast CT (NCCT) was performed in supine position with 25–30 degree cranial gantry tilt to obtain images through both the cartilaginous and ligamentous portions of the SI joint using the 16-slice CT scanner.

Inclusion criteria:

1. Should have inflammatory low back pain
2. Low back pain >3months
3. improved with exercise
4. Not relieved by rest
5. Limited lumbar motion
6. Patients with HLA-B27 positive status
7. Patients with age group 20-35 yr

Exclusion criteria:

1. Patient not willing for the study
2. Patients with cardiac pacemakers & metallic implants
3. Motion disorder and claustrophobic patients
4. Overlap Syndrome.
5. Patients with HLA-B27 negative status
6. Age <20yr and >35yr.

RESULT:- Out of total 51 patients diagnosed Ankylosing spondylitis, 43 patients were males, while 8 were females (5.4:1). The age range of patients was from 20 to 35 years. The age distribution of patients has been depicted in (Chart 1).

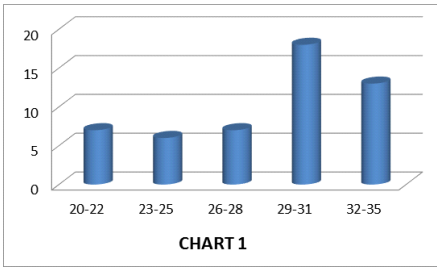


CHART 1 : Bar graph depicting the age distribution of patients.

The maximum number of patients noted were young adults, in the age group of 21-30 years (46.6%). The clinical features noted were back pain, fatigue, stiffness and inflammation. Back pain emerged as the most common symptom, seen in 42 (27%), followed by stiffness in 38 (24%), fatigue 35 (23%) and inflammation 41(26%). The clinical

findings have been elaborated in (Chart 2).

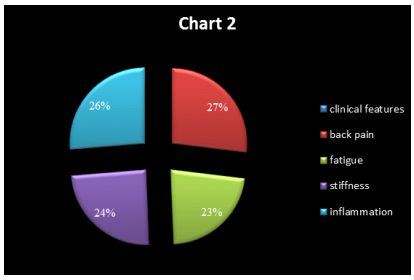


CHART 2 : Pie chart depicting the clinical features.

Bilateral symmetry was seen in 45 (88%) cases and 6 (12%) are unilateral. Almost all cases were associated with HLAB27 positive status along with 36 patient associated with smoking. Lumbar spine was involved in 45 (65%) patients and cervical was involved in 24 (35%) patients.

The main CT features are bone erosions, joint space alterations, subchondral sclerosis, and ankylosis. On C.T. finding, 34 (35%) cases presented with subchondral sclerosis followed by joint erosion in 23 (24%) cases, joint space alteration in 15 cases (16%), bony ankylosis in 10 cases (11%), facet inflammatory disease in 7 (7%) cases , bony lesion in 5 (5%) cases , spinal canal stenosis and vertebral scalloping in 1(1%) case. (Table 1)

TABLE 1: COMPUTED TOMOGRAPHY FEATURES

COMPUTED TOMOGRAPHY FINDINGS	NO. OF PATIENTS (PERCENTAGE)
Joint erosion	23 (24%)
Subchondral sclerosis	34 (35%)
Bony ankylosis	10 (11%)
Joint space alteration	15 (16%)
Fractures	0 (0%)
Spinal canal stenosis	1 (1%)
Bony lesion	5 (5%)
Vertebral scalloping	1 (1%)
Facet inflammatory dis.	7 (7%)

On M.R.I finding, presence of marrow oedema was seen in 37 (22%) cases followed by irregularities of articular margins in 34(21%) cases, presence of erosion in 32 (19%) cases, subchondral sclerosis in 23 (14%) cases, narrowing of joint space in 15 (9%) cases, bony ankylosis in 9 (5%) cases, spinal canal compromise in 7 (4.2%) cases, spinal canal injury in 6 (4%) cases and spinal cord stenosis in 3 (2%) cases (Table 2).

TABLE 2 : MAGNETIC RESONANCE IMAGING FEATURES

MAGNETIC RESONANCE IMAGING FINDINGS	NUMBER OF PATIENTS (PERCENTAGE)
Presence of marrow oedema	37 (22%)
Irregularities of articular margins	34 (21%)
Presence of erosion	32 (19%)
Subchondral sclerosis	23 (14%)
Narrowing of joint space	15 (9%)
Bony ankylosis	9 (5%)
Spinal canal stenosis	3 (2%)
Spinal canal compromise	7 (4.2%)
Spinal cord injury	6 (4%)

DISCUSSION:- In this study, males were most commonly affected compared to female which is in favour to study done by J Braun et al[10] and Frane et al[11] in contrast to study done by Jimenez et al[12] . Lumbar predominance was more than cervical which is in favor to study done by Jennifer et al [13]and in contrast to study done by Resnick et al[14] in which cervical were more common in women.

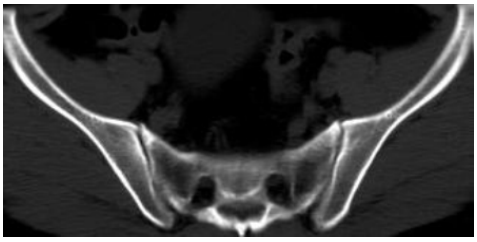


Fig 1 : Axial CT- Scan showing reduced joint space in bilateral SI joints suspicious for sacroiliitis

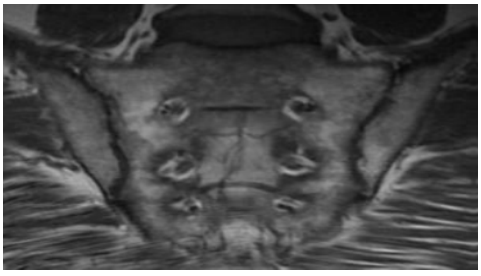


Fig 2 : MRI STIR coronal sequence showing bilateral sacroiliitis with bone marrow edema and erosions

Chart 3 depicts more joint erosion finding in M.R.I as compared to C.T. Subchondral sclerosis and bony ankylosis are more common finding in C.T. with spinal cord stenosis as more common finding in M.R.I which is in favour to study done by Wilfred et al.[15]

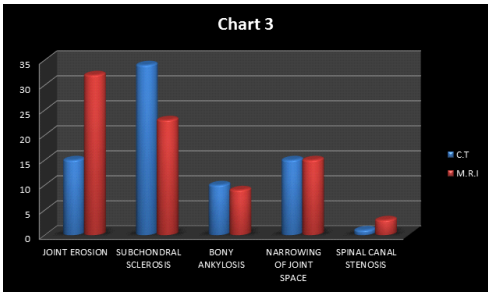


CHART 3 : Chart illustrating a comparison between CT and MRI findings.

The value of MRI in the diagnosis of sacroiliitis has been well established. MRI accurately delineates the cardinal features of sacroiliitis, like symmetry, presence of erosions, subchondral edema, sclerosis and ankylosis. Furthermore, MRI plays a useful role in patients with early disease, by its superior ability to directly image changes in articular cartilage.

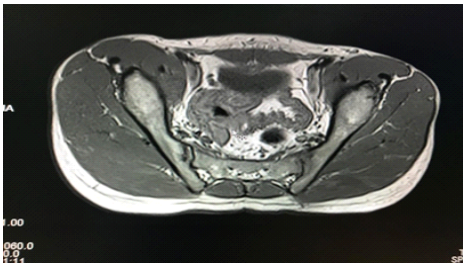


Fig 3 : MRI T1WI axial scan shows reduced joint space with altered marrow signal intensity on left side.

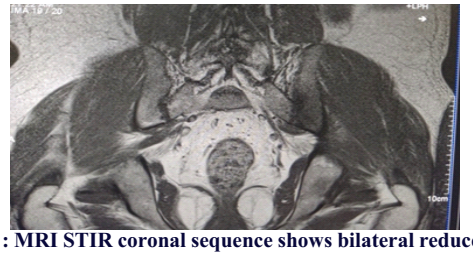


Fig 4 : MRI STIR coronal sequence shows bilateral reduced joint

space with altered marrow signal intensity (L>R).

In the present set of patients, the CT showed higher sensitivity for detecting subchondral sclerosis i.e 34 (66.6%) cases and joint erosions in 23 (45%) cases, in favour to study done by Wilfred et al [15]. MRI showed more marrow oedema in 37 cases in favour to study done by J Braun et al [16], Mikkel et al [17] and Anne et al [18]. Another study by Battafarano DF et al [19]found MRI has 100% predictability and is the best single test for confirming active inflammatory SI. Similar study by Finbar o'shea et al [20], observed that acute inflammation is better reflected by MRI.

CONCLUSION:- Imaging is an integral part in the early detection of disease and optimizing management of affected patients for their better prognosis. CT and MRI plays a decisive role in the diagnosis and these modalities are also helpful in monitoring the disease.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. 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.
2. Sengupta R, Stone MA. The assessment of ankylosing spondylitis inclinical practice. Nat Clin Pract Rheumatol 2007;3:496-503.
3. Braun J, Sieper J. Ankylosing spondylitis. Lancet 2007; 369:1379-90.
4. Jacobson JA, Girish G, Jiang Y, Resnick D. Radiographic evaluation of Arthritis : Inflammatory conditions. Radiology 2008; 248:378-89.
5. Braun J, Sieper J. The sacroiliac joint in the spondyloarthropathies. Curr Opin Rheumatol 1996;8: 275-87.
6. Braun J, Bollow M, Sieper J. Radiologic diagnosis and pathology of the spondyloarthropathies. Rheum Dis Clin North Am 1998; 24: 697-735.
7. Martín-Mola E et al. Sustained efficacy and safety, including patient-reported outcomes, with etanercept treatment over 5 years in patients with ankylosing spondylitis. Clin Exp Rheumatol. 2010; 28(2):238-45.
8. Text book of rheumatology, spondyloarthropathies and undifferentiated spondyloarthropathies > history and terminology.3ed, 6.4.1.
9. Ranga, et al.: Comparision of Xray, CT and MRI in Sacroiliitis in A.S.
10. Braun JD, van der Heijde. Imaging and scoring in ankylosing spondylitis. Best Pract Res Clin Rheumatol 2002;16:573–604.
11. Frane Grubišić et al.: Clinical and Radiological Features of Ankylosing Spondylitis, Coll. Antropol. 39 (2015) 4: 927–934.
12. JIMENEZ-BALDERAS FJ, MINTZ G, J Rheumatol, 20 (1993) 2069.
13. Jennifer et al Radiology: Volume 258: Number 1—January 2011 n radiology.rsna.org
14. Resnick D, Niwayama G. Diagnosis of bone and joint disorders. 2nd ed. Philadelphia: Saunders, 1988; 695-696:932-953.
15. Wilfred et al January-February,1997 Volume 21, Issue 1, Pages 54-62.
16. Braun J , Bollow M , Eggens U , König H , DistlerA , Sieper J . Use of dynamic magneticresonance imaging with fast imaging in the detection of early and advanced sacroiliitis in spondylarthropathy patients . Arthritis Rheum 1994 ; 37 (7): 1039 – 1045 .
17. Østergaard M, Lambert RGW. Imaging in ankylosing spondylitis. Ther Adv Musculoskelet Dis. 2012;4(4):301-11.
18. Anne Grethe Jurik, Department of Radiology, Aarhus University Hospital, Noerrebrogade 44, DK8000 Aarhus C, Denmark. Proc. Intl. Soc. Mag. Reson. Med. 18 (2010)
19. Battafarano DF et al. Comparison of bone scan, computed tomography, and magnetic resonance imaging in the diagnosis of active sacroiliitis. Semin arthritis Rheum, 1993 Dec: 23(3):161-76.
20. Finbar o'shea et al. the challenge of early diagnosis in ankylosing spondylitis.early sacroiliitis in patients with spondyloarthropathy. J rheumato.