

Original Paper

The Frequency of Asymptomatic Sacroiliitis in Jordanian Patients with Crohn's Disease. Assessment by Magnetic Resonance Enterography

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Received: July 26, 2019

Accepted: August 8, 2019

Online Published: October 31, 2019

doi:10.22158/rhs.v4n4p306

URL: <http://dx.doi.org/10.22158/rhs.v4n4p306>

Abstract

Background: our aim was to assess frequency of asymptomatic sacroiliitis (SI) in patients with Crohns disease referred for magnetic resonant enterography (MRE) as a part of small bowel evaluation.

Methods: this was a retrospective study of all patients with Crohns disease who were referred for MRE between January of 2016 to October of 2017 to Jordan University Hospital. All MRE were reviewed by an experienced radiologist and SI was diagnosed and graded based on predefined MRI criteria. All patients were contacted and assessed for symptomatic SI based on Assessment of SpondyloArthritis international Society (ASAS) criteria of 2009 for axial spondyloarthritis. All patients were included in the final analysis.

Results: a total of 60 patients were included, overall 18 (30%) showed evidence of SI, two patients were symptomatic and another two were diagnosed with ankylosing spondylitis as assessed by ASAS criteria. Those were excluded. Fourteen (23%) patients were included in the final analysis, with an average age of 36.7 years, 71% males. The average disease duration was 7.25 years. The percentage of ASA used by patients was 50%, Azathioprine 71%, Biologic agents in 36% in combination and single drug was used in 36% of patients.

Conclusion: The prevalence of asymptomatic SI based on predefined MRI criteria was 23%, the importance of this finding and future course progression needs further studies.

Keywords

sacroiliitis, Crohns disease, magnetic resonant enterography, MRE

1. Introduction

Extra-intestinal musculoskeletal manifestations associated with Inflammatory bowel disease (IBD), can be divided into axial and peripheral arthropathy, which can be a cause of significant morbidity that can adversely affect the quality of life in these patients. Peripheral arthropathy represent the most frequent (40%) extra-intestinal manifestation in IBD (Gravallese & Kantrowitz, 1988; Vavricka, Schoepfer, Scharl, Lakatos, Navarini, & Rogler, 2015). These manifestations occur more frequently in patients with Crohn's disease (CD) (Veloso, Carvalho, & Magro, 1996). Sacroiliitis (SI) is considered one of the common axial arthropathies with an estimated prevalence of around 10% of Crohn's patients (Maren, Jolanda, Johanna, & Angelique, 2017). The diagnosis is based upon the presence of characteristic inflammatory type back pain with evidence of SI on imaging (Sieper et al., 2009). Both clinical examination and plain radiographs have their own limitations of only detecting advanced disease. CT enterography is a more sensitive technique to assess SI joint, a frequent radiologic study in patients with CD to assess small bowel disease, but its major drawback is the risk of radiation exposure. MRI is a promising technology with a higher sensitivity and specificity for the diagnosis of SI. As MRI is being utilized more frequently in patients with Crohn's disease, more and more patients are found to have a positive MRI evidence of SI without clinical signs or symptoms. Limited number of publications have utilized MRI for the diagnosis of asymptomatic SI in patients with CD. The prevalence and clinical significance of such finding on MRI is currently unclear at this time and whether these patients may progress to symptomatic disease needs to be determined.

The aim of this study is to assess the frequency of asymptomatic sacroiliitis in Jordanian Crohn's patients based on predefined MRI criteria.

2. Methods

This is a retrospective study for all patients with CD who underwent Magnetic Resonance Enteroclysis (MRE) at Jordan university hospital to evaluate their small bowel as part of disease extent work up at the discretion of the treating physician. The study was carried out between January 2016 and October 2017. All cases were identified and included in the final analysis. All MREs were reviewed by an experienced radiologist. Table 1 summarizes the utilized MRE protocol.

Table 1. MRE Protocol

Sequence	Slide thickness/mm	orientation	Slices	Dist. Factor/ %	TR/ ms	TE/ ms	Flip angle	Voxel size/ mm	time
T2_haste	4.0mm	coronal	25	30	1400	94	160	2,5 x 1.7 x 4.0	0:35
T2_haste	4.0	transverse	40	30	1400	90	150	1.9 x 1.3 x 4.0	0:56
T1_vibe	3:00	coronal	64	20	4.13	1.41	9.0	2:0 x 1.4 x 3,0	0:18
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T1_vibe With contrast	3:00	coronal	64	20	4.13	1.41	9.0	2.0 x 1.4 x 3.0	1.05
T1_vibe With contrast	3:00	transverse	40	20	4.23	1.46	9.0	1.7 x 1.2 x 3.0	0.12

Electronic medical records were reviewed, those with the final diagnosis of IBD/Crohn's (Made by a gastroenterologist) were selected and classified using the Montreal classification for clinical, molecular, and serological classification of inflammatory bowel disease, Table 2 (Silverberg et al., 2005; Satsangi, Silverberg, Vermeire, & Colombel, 2006).

Table 2. Montreal Classification for Crohn's Disease (Jaremko, Liu, Winn, Ellsworth, & Lambert, 2014)

Age at diagnosis	<ul style="list-style-type: none"> • A1 below 16 y • A2 between 17 and 40 y • A3 above 40 y
Location	<ul style="list-style-type: none"> • L1 ileal • L2 colonic • L3 ileocolonic • L4 isolated upper disease*
Behaviour	<ul style="list-style-type: none"> • B1 non-stricturing, non-penetrating • B2 stricturing • B3 penetrating • p perianal disease modifier _

* L4 is a modifier that can be added to L1-L3 when concomitant upper gastrointestinal disease is present.

“p” is added to B1-B3 when concomitant perianal disease is present.

All patients with SI based on MRI criteria were contacted and assessed for symptomatic SI based on Assessment of SpondyloArthritis international Society (ASAS) criteria of 2009 for axial spondyloarthritis. Although these criteria were based on plain radiography findings of structural damage such as sclerosis, erosions and ankylosis, MRI can detect bone marrow edema which is an earlier manifestation of the disease process in the form of one focus of subchondral or periarticular bone marrow edema on more than two slices or locations, or more than one focus on one slice Table 3 (Sieper et al., 2009; Rudwaleit, 2009; Jaremko, Liu, Winn, Ellsworth, & Lambert, 2014).

Table 3. New York Sacroiliitis Radiological Grading Criteria (Sudol-Szopińska, Kwiatkowska, Włodkowska-Korytkowska, Matuszewska, & Grochowska, 2015)

Grade 0	No abnormalities (sacroiliac joints normal)
Grade 1	Suspicious for abnormalities (blurring of the joint margins)
Grade 2	Minimal abnormalities (solitary erosions and juxta-articular sclerosis in small sacral or iliac areas)
Grade 3	Advanced abnormalities (manifested juxta-articular sclerosis, numerous erosions with widening of joint space, possible partial ankylosis)
Grade 4	Complete ankylosis

3. Results

There was a total of 60 patients who underwent MRE with a final diagnosis of Crohn's disease, overall 18 (30%) showed signs of joint inflammation on MRI. of those two patients were symptomatic and another two were diagnosed with ankylosing spondylitis as assessed by ASAS criteria (Sieper et al., 2009).

Hence, those four patients were excluded, whereas 14 patient fulfilled the criteria of having asymptomatic SI and Crohn's disease (23%), with an average age of 36.7, most of them were males (71%), Table 4 and Table 5.

Table 4. Characteristics of Patient with Asymptomatic SI and CD

Age	Sex	Montreal classification (10)	Disease duration (years)
41	M	A2/L1+L4/B2	3
66	F	A3/L1/B1	2
54	F	A2/L3B1	24
48	F	A2/L3/B3	17
16	M	A1/L2/B1	1
42	M	A2/L4/B1	8
39	M	A2/L1/B2	14
37	M	A2/L1/B3p	9
23	M	A2/L1+L4/B3	5
24	M	A2/L1/B1	3
49	F	A3/L2/B1	3
19	M	A2/L3/B2	3
21	M	A2/L3/B1	4
40	M	A2/L2/B2	2

Table 5. Demography of 14 Patient Fulfilled the Criteria of Having Asymptomatic SI and Crohn's Disease

	Male	Female	Total
Age range	16-42	48-66	16-66
Median age	30.2	54.2	37.1
Number of patients	10 (71%)	4 (29%)	14 (100%)
Ratio	2.5	1	-

The medications used in these patients including 5-ASA, Azathioprine and Biologics agents are detailed in table 6. The percentage of ASA used by patients was 50%, Azathioprine 71%, Biologic agents in 36% and single drug was used in 36% of patients.

Table 6. Medications Used by the 14 Patients

Medications used in 14 patients	
Azathioprine + 5-ASA	5
	2
Azathioprine + Adalimumab	3
Infliximab + 5-ASA	1
Azathioprine + Sulfasalazine	1
Infliximab	1
Azathioprine	1

4. Discussion

Imaging studies using various modalities (X-ray/CT/MRE) are an integral part of the evaluation and management of Crohn's disease, for assessing disease activity, extent of the disease and complications. This approach lead to an increase in the diagnosis of asymptomatic SI in IBD/Crohn's patient. These modalities have different sensitivity and specificity scores. This reflects differences in regional and local experience. For example, the rate of detection of asymptomatic SI involvement as assessed by plain radiography vary widely from 10 to 27% (McEniff, Eustace, McCarthy, O'Malley, O'Morain, & Hamilton, 1995; Queiro, Maiz, Intxausti, de Dios, Belzunegui, González, & Figueroa, 2000; Bandinelli et al., 2014). On the other hand, CT scan detection studies were in the range of 13 to 32% (McEniff, Eustace, McCarthy, O'Malley, O'Morain, & Hamilton, 1995; Chan, Sari, Salonen, Silverberg, Haroon, & Inman, n.d.; Turkcapar et al., 2006).

Orchard et al. (2009) examined the relationship between MRI findings of SI in patients with established Crohn's disease, in his study 39% of the patients had evidence of SI, of those 35% were asymptomatic. In our study most of the patients with asymptomatic sacroiliitis were young males, in contrast to a

study by Jacob et al. (2014), in which, most of his patients with sacroiliitis were old females where their average age was similar to the average age of the female cases in our study. However, most of their patients had symptomatic SI. It would be interesting to follow and compare female to male gender in regards to future development of frank sacroiliitis.

A recent study by Girolamo et al. (2018), patients who underwent MRE in an Italian hospital and assessed for asymptomatic SI, 35 of 121 (29%) had asymptomatic SI, while the estimated prevalence in our study is 23%, this difference can be attributed to the sample size, but not to ethnicity, since both study groups are of Mediterranean origin.

5. Conclusion

Asymptomatic sacroiliitis was detected by MRI in 23% of our patient population with Crohns disease. 71% were young males. The significance of these findings needs further studies and long term follow up to assess the future progression or regression of SI in this patient population and the impact of current therapeutic options especially biologics on that.

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