

*Research article***Spondyloarthropathic Features in Patients with Rheumatoid Arthritis**

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**Abstract**

**Background:** The main clinical symptom of Rheumatoid arthritis is symmetric small-joint polyarthritis, while the spinal column is usually not involved except for atlantoaxial subluxation, a severe and rarely seen complication of advanced RA. **Methods:** 100 patients with Rheumatoid arthritis of either sex or age ranged between 18-72 years old and 20 healthy age and sex matched individuals were enrolled in this study. Full history, clinical examination, laboratory investigations and imaging techniques were performed for all patients. **Results:** 52 patients (52%) had inflammatory back pain according to calin criteria, 63 patients had gluteal pain, 90 patients had clinical enthesitis, 52 patients had ultrasonographic enthesitis according to MASEI score ( $\geq 1$ ), 1 patient (1%) had family history of psoriasis, 21 patients (21%) had positive test of HLA-B27, 56 patients (56%) fulfilled ESSG criteria, 26 patients (26%) fulfilled Amor's criteria, 22 patients (22%) fulfilled axial ASAS criteria, and 20 (20%) patients fulfilled modified New York criteria of AS. **Conclusion:** This study suggests that the frequency of SpA features in patients with RA may be much higher than expected.

**Keywords:** Rheumatoid arthritis – Ankylosing spondylitis - Spondyloarthritis - Inflammatory back pain - Enthesitis – MASEI score - HLA-B27

**Introduction:**

Rheumatoid arthritis (RA) is a chronic autoimmune disease that is characterized by inflammation and destruction of joints. The disease has a major effect on health status and quality of life and imposes a substantial economic burden on patients and society<sup>(1)</sup>. In contrast Ankylosing Spondylitis (AS) and related spondyloarthritis (SpA) are characterized by axial disease involving the sacroiliac joints (SIJ) and spine, causing inflammatory back pain (IBP)<sup>(1)</sup>. Sacroiliitis is an atypical joint involvement of RA, bilateral sacroiliitis cases accompanying late RA have been reported in the literature, although rarely<sup>(2)</sup>. An increased prevalence of low back pain was also associated with HLA-B27 in the patients with RA.<sup>(3)</sup> Though the presence of HLA-B27 could modify the phenotypes of patients with RA towards resembling SpA. There have been some reports in this direction<sup>(4)</sup>. One of these studies reported an increased prevalence of clinical enthesitis in patients with early arthritis fulfilling RA criteria<sup>(5)</sup>.

**Aim of the work**

The aim of the work was to detect the frequency of axial and or peripheral spondyloarthropathic features in patients with rheumatoid arthritis.

**Patients and methods**

One hundred patients (82 female, 18 male) who fulfilled the 1987 ACR classification criteria for Rheumatoid arthritis<sup>(6)</sup> from Rheumatology outpatient clinic, Minia University Hospital in the period from July 2014 to August 2015 were included in the study. The mean of age was  $41.37 \pm 11.93$  years (range 18-72 years) and the mean of disease duration was  $5.99 \pm 5.31$  years (range 0.20-20 years). Twenty healthy age and sex matched individuals were served as a control group. Excluded from the study, patients diagnosed as overlap disease and other causes of sacroiliitis like pyogenic sacroiliitis, Familial Mediterranean fever

and Behcet's disease. The nature of the study was explained to all patients. The laboratory and radiological procedures

represent standard care and pose no ethical conflicts. A verbal consent was obtained from all patients.

All patients were subjected to detailed medical history and complete physical examination. Standard pelvic X-rays for examination of the SIJ were ordered in all the patients. MRI of SIJ was performed for patients of RA who have inflammatory back pain with normal x ray of sacroiliac joints, or have suspicious of sacroiliitis in x ray and healthy control volunteers.

Musculoskeletal ultrasonography for enthesitis (Plantar aponeurosis enthesitis, Achilles tendon enthesitis, Distal patellar ligament, Proximal patellar ligament enthesitis, Quadriceps tendon enthesitis and triceps tendon enthesitis). Erythrocyte sedimentation rate (ESR)<sup>(4)</sup>, C- Reactive protein (CRP)<sup>(4)</sup>, Rheumatoid factor (RF)<sup>(11)</sup> were done for all patients and controls, and Human leukocyte antigen B27 (HLA-B27)<sup>(11)</sup> was done for patients who fulfilled any of spondyloarthropathy criteria.

#### Statistical analysis:

Analysis of data was done by personal computer using SPSS (Statistical program for social science) version 16. The data of all software patients and controls were fed into an IBM personal computer. Data were expressed as mean±SD for parametric variables and as number and percent for non-parametric variable. Comparison between groups for parametric data was done by independent samples t-test (unpaired t-test). Chi – square ( $\chi^2$ ) test was used to compare qualitative variables. The difference was expressed as probability of value (P value). The difference was considered significant if  $P < 0.05$ .

## Results

### *Demographic data of the studied population:*

Demographic data of the studied population is shown in Table 1. Rheumatoid arthritis patients' age ranged between 18 and 77 years, the mean of age was  $41.37 \pm 11.93$  years and disease duration ranged between 0.20-20 years, the mean of was  $6.99 \pm 6.31$  years. The control group included 16 females and 8 males their age ranged between 20-70 years with a mean of  $41.00 \pm 11.90$  years. Both patients and control were age and sex matched.

### *Characteristics of RA patients:*

Characteristics of rheumatoid arthritis patients are shown in Table 2. Figure 1 shows classification steps for AS (mNY) and axial SpA (ASAS). Twenty five patients (16 with radiographic sacroiliitis, 13 MRI sacroiliitis and one HLA-B27 positivity) out of 100 RA patients (25%) were classified as having axial SpA according to new ASAS classification criteria.

### *Spondyloarthritis features in rheumatoid arthritis patients:*

Back pain was found in 80 patients (80%), being non-inflammatory in 33 patients (33%) and inflammatory in 47 patients (47%). According to Calin criteria 52 patients (52%) had inflammatory back pain and according to experts' criteria 40 patients (40%) had inflammatory back pain. Other spondyloarthritis features are shown in Table 3.

### *Characteristics of patients with both RA and Ankylosing Spondylitis:*

The modified New York criteria of Ankylosing spondylitis (mNY AS) was fulfilled in 20 RA patients (20%). Out of these patients, 17 had clinical criteria of mNY AS, 16 had gluteal pain, 19 had clinical enthesitis, 9 had positive rheumatoid factor and 7 had positive HLA-B27.

Table 1: Demographic data of the studied population

		Patients (n=100)	Controls (n=20)	X <sup>2</sup> /t	P value
Age (years)	Range	18-72	20-70	-0.06	0.90
	Mean ± SD	41.37 ± 11.93	41.00 ± 11.90		
Sex	Male	17 (17%)	4 (20%)	0.10	0.70
	Female	83 (83%)	16 (80%)		
Disease duration (years)	Range	0.20-20	-	-	-
	Mean ± SD	0.99 ± 0.31			
Age at onset (years)	Range	17-70	-	-	-
	Mean ± SD	30.39 ± 11.23			

By x<sup>2</sup> test and students t-test

Table 2: Characteristics of the rheumatoid arthritis patients

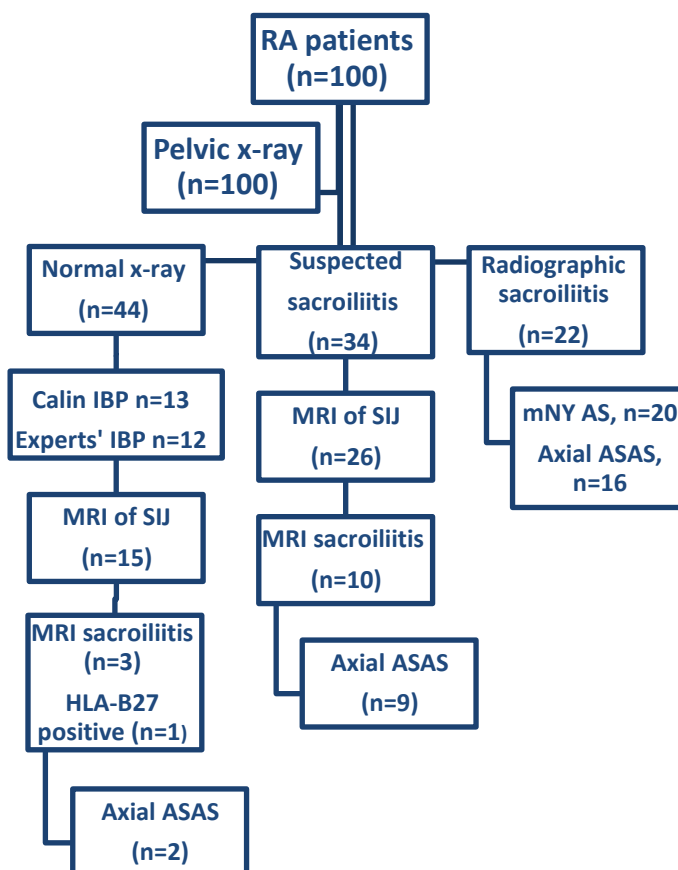
	Range	Mean ± SD
Morning stiffness (minutes)	0 - 120	34.86 ± 33.79
Swollen joints in DAS-28	0 - 10	3.81 ± 3.70
Tender joints in DAS-28	0 - 28	9.23 ± 7.93
DAS-28	1.1 - 7.3	4.44 ± 1.12
RAI	0 - 30	11.97 ± 8.02
NRS	0 - 10	4.70 ± 1.90
HAQ	0 - 3	1.16 ± 0.57
ESR (mmHg)	0 - 120	44.07 ± 27.77
	<b>N (%)</b>	
Rheumatoid Nodule	17 (17%)	
Raynaud's phenomenon	31 (31%)	
C-reactive protein (CRP) positivity	74 (74%)	
Rheumatoid factor (RF) positivity	06 (06%)	
Hand and wrist erosions in plain x-ray	78 (78%)	

DAS=Disease activity Score for 28 joints; RAI=Ritchi articular index; NRS=Numerical rating scale; HAQ=Health assessment questionnaire; ESR=Erythrocyte Sedimentation Rate.

**Table 3: Spondyloarthritis features in rheumatoid arthritis patients**

	<b>Patients (n=100)</b>
<b>Inflammatory back pain</b>	
According to Calin criteria	02/100
According to Experts criteria	40/100
<b>Gluteal pain</b>	73/100
<b>Enthesitis</b>	90/100
Tenderness of Achilles tendon	46
Tenderness at Plantar aponeurosis enthesitis	46
Tenderness at Distal patellar ligament enthesitis or proximal patellar ligament enthesitis	14
Tenderness at Quadriceps tendon enthesitis	8
Tenderness at medial epicondyle	26
Tenderness at lateral epicondyle	09
<b>Ultrasonographic enthesitis according to MASEI score (<math>\geq 1^{\wedge}</math>)</b>	72/100
<b>Family history of psoriasis</b>	1/100
<b>HLA-B*27 positivity</b>	21/08

MASEI=Madrid Sonographic Enthesitis Index; HLA-B\*27= Human Leucocyte Antigen –B\*27.



**Fig 1: Flow chart showing the classification steps for ankylosing spondylitis (mNY) and axial spondyloarthritis (ASAS)**

## Discussion

Spondyloarthritis (SpA) and rheumatoid arthritis (RA) are two most common forms of inflammatory arthritis<sup>(1,2)</sup>. There is no reported data about the prevalence of inflammatory back pain (IBP) or other features of spondyloarthritis among RA patients. Furthermore, the frequency of patients with RA also fulfilling the existing classification criteria for AS and SpA has not been investigated thoroughly<sup>(1,3)</sup>. The prevalence of chronic low back pain in patients with RA has been reported to be between 33.0 and 63.0 % in several studies<sup>(4)</sup>. However, these studies did not investigate whether the patients suffering from inflammatory back pain. In fact, the available literature for the prevalence of IBP in general population is also very limited. Its prevalence was estimated to be 1.8 % in United States adults aged 20–49 years<sup>(5)</sup>. Enthesitis, the inflammation of the entheses, is very prevalent and relatively specific of all forms of SpA motivating its inclusion as part of the disease classification criteria<sup>(6,7)</sup>. Ultrasonography evaluation has shown an increased frequency of abnormalities in patients with RA relative to healthy controls in spite of the complete absence of clinical enthesitis<sup>(8,9)</sup>.

In 1981, one study including 184 patients with Ankylosing spondylitis or Reactive syndrome showed that five of them had concomitant diagnostic of RA and two of these five patients presented also with Felty's syndrome.<sup>(10)</sup>

Can et al.,<sup>(11)</sup> in their study found that the frequency of IBP was (16.8%) and other SpA features such as radiographic sacroiliitis (2.4%) and enthesitis (1.9%) in patients with RA. Among RA patients, 1.8% fulfilled the mNY classification criteria for AS, 18.6% the ESSG criteria and 10.6% the Amor's criteria for SpA and 0.3% the ASAS criteria for axial SpA.<sup>(11)</sup> In our study we found higher frequency of IBP (52%) and other SpA features such as radiographic sacroiliitis (22%) and enthesitis (9.0%) in patients with RA. Among RA patients, 20% fulfilled the mNY classification criteria for AS, 0.6% the ESSG criteria and 26% the Amor's criteria for SpA and 27% the ASAS criteria for axial SpA.

135

In our study pelvic radiographs were performed to 100 patients and was normal in 44 patients (44%), radiographic sacroiliitis was found in 22 patients (22%) and 34 patients (34%) had suspected sacroiliitis, out of these 34 patients MRI was done in 26 patients and MRI sacroiliitis was found in 10 patients in comparison to the study of Can et al.,<sup>(11)</sup> they found that pelvic radiography could be performed in 164 patients with RA, and four of these patients (2.4%) were reported to have bilateral grade 3 sacroiliitis. Among 23 patients with suspected sacroiliitis, CT of SIJ was performed in 10 patients and MRI of SIJ in 11. There was no sign of sacroiliitis on CTs, but MRI showed acute inflammation on SIJs in one patient.<sup>(11)</sup>

Gluteal pain was present in 63 patients (63%) and clinical enthesitis in 90 patients (90%) in our study while in the study of Can et al., Gluteal pain was present in 30.0% of patients and clinical enthesitis in 11.9%.<sup>(11)</sup>

In our study ultra-sonographic enthesitis according to MASEI score (Madrid Sonographic Enthesitis Index) ( $\geq 18$ ) was found in 22 patients (22%) while in the study of Mera-Varela, et al.,<sup>(12)</sup> 28.4% patients had MASEI score  $\geq 18$

In conclusion this study suggests that the prevalence of SpA features in patients with RA may be much higher than expected. Further studies on bigger number of patients are recommended

**Acknowledgment:** Many deep thanks and gratitude go to my supervisors, my colleagues, patients and every person who had helped me by any means throughout this work.

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