Research Article

Pattern of Rheumatoid Arthritis in Minia Governorate

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Abstract

Background: Rheumatoid arthritis is a chronic systemic autoimmune disease. It is characterized by destruction of bone and cartilage, persistent synovitis and chronic disability that leads to structural joint damage causing deformity. **Aim of the work:** Was to assess pattern of rheumatoid arthritis at Minia governorate regarding disease presentation, disease activity, severity, disease remission, drug use and extraarticular manifestations. **Methods:** One hundred rheumatoid arthritis (RA) patients were included in this study, subjected to history taking, clinical examination and laboratory investigations. Assessment of disease activity was done using disease activity score. Disease disability was assessed by modified health assessment questionnaire and functional status by American College of Rheumatology criteria for functional status. Disease severity was assessed by simple erosion narrowing score and musculoskeletal ultrasound. **Results**: This study included 100 patients (75% females and 25% males). Their ages ranged from 18 to 63 years with a mean of 42.32 ± 12.13. Age at onset of rheumatoid arthritis: ranged from 18-50 years with a mean of 35.7±11.8. Disease duration ranged from 1-25 years with a mean of 7.75±5.96. Duration of morning stiffness ranged from 0 to 180 min. with a mean of 74.94 ± 46.53. The commonest joint affected was metacarpophalangeal joint in 88% of rheumatoid arthritis patients, while the least affected joints were sternoclavicular joint and acromiclavicular joint were affected in 5% of rheumatoid arthritis patients. Secondary fibromyalgia was the commonest extra articular manifestation in 14% of rheumatoid arthritis, while Raynaud's phenomenon was present in only 2% of our patients. The most common used drug was hydroxychloroquine in 91% of RA patients, followed by methotrexate in 63% of rheumatoid arthritis patients. Regarding laboratory findings: rheumatoid factor was positive in 61% of rheumatoid arthritis patients, Anti citrullinated peptide antibodies was positive in 62% and C-reactive protein was positive in 65%. Simple erosion narrowing scale ranged from 0-29 with a mean of 12.82±5.98, erosion count ranged from 0-15 with a mean of 5.96± 3.18, joint space narrowing count ranged from 0-18 with a mean of 6.92±3.99, 65% of patients were class II of functional status and 66% had moderate score of modified health assessment questionnaire, 57% of RA patients had moderate disease activity score. Regarding ultrasound disease activity score parameters, synovial hypertrophy was present in all of our patients (100%) and erosion was present in 84%. Higher disease activity score affected in late onset rheumatoid arthritis patients more than young onset rheumatoid arthritis patients, but erosions more in young onset rheumatoid arthritis patients, sever modified health assessment questionnaire more in young onset rheumatoid arthritis group. As regard to sex the study showed females patients had more active and more disabling than males, eroions were more in males. **Conclusion:** In Minia governorate, rheumatoid arthritis was more common in middle aged females, most patients had insidious onset and moderate disease activity, MCPs were the most commonly affected joints, MTX and HCQ were the most widely used treatment. Late onset rheumatoid arthritis had higher disease activity score, less disabling and less erosive disease than young onset rheumatoid arthritis. Female patients had more active, more disabling and more erosive disease than males.

Keywords: Rheumatoid arthritis, disease activity score 28, health assessment questionnaire-disability index, simple erosion narrowing score, ultrasound disease activity score.

Introduction

Rheumatoid arthritis is a systemic autoimmune disease characterized by inflammatory polyarthritis which affects peripheral joints, specially the small joints of the hands and feet. It is a chronic, progressive disease in which untreated inflammation may lead to cartilage and bone erosions and joint destruction resulting in functional impairment. As RA is a progressive disease, it can cause extra articular complications within several organ systems. The majority of the deaths in patients with RA are

related to cardiovascular disease[1]. Conventional Radiography presents several attractive features for the assessment and monitoring of patients with RA. Radiographs provide record of permanent damage. Furthermore, ultrasonography and magnetic resonance imaging may be more sensitive than conventional radiography in detecting abnormalities like synovitis, tenosynovitis, tendon integrity, effusions, early erosions and cartilage volume[2]. One percentage of people worldwide are the estimated prevalence of RA**.**

Rheumatoid arthritis occurs in women to men ratio 2:1**.** The disease is common in northern Europe and North America compared with parts of the developing world, such as rural West Africa . 1.5 million (0.6%) of US adults ≥ 18 were estimated to have RA In 2005. In 2005, the age standardized prevalence of RA among women in the Rochester Epidemiology Project had increased to 1% (9.8 per 1,000) from 0.8% (7.7 per 1,000) in 1995. The prevalence among men was the same (0.4%) in 1995 and 2005. An increase in RA prevalence among both women and men from 1996 to 2010 was reported in another study, in Ontario, Canada[3].

Aim of the work

To assess `pattern of rheumatoid arthritis in Minia governorate regarding disease presentation, disease activity, disease severity, disease remission, drug use and extraarticular manifestations.

Patients and methods

One hundred consecutive patients who fulfilled the 2010 ACR -EULAR classification criteria for RA**[4]** were included in the present study. All patients were attending the outpatient rheumatology clinic, Minia University Hospital in the period from December 2016 to July 2017. These patients divided according to age at onset into YORA and LORA**[5].** 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. Disease activity measures as disease activity score 28 (DAS 28-ESR)[5], Visual analogue scale (VAS)[6] and Disease disability indices as ACR classification criteria of functional status in RA[7], Health assessment questionnaire disability index[8,9] were ordered in all the patients. Erthrocyte sidementation rate (ESR), C-Reactive protein (CRP), Rheumatoid factor (RF), Anti citrullinated peptide antibody, Liver and kidney function, Fasting and post prandial blood sugar were done for patients.

Plain X-ray of both hands, wrists and both feet using simple erosion narrowing score (SENS) [10] was done to all patients. Musculoskeletal ultrasonography using Ultrasound DAS (US DAS) in the following joints: MCP joints, PIP joints, wrists, elbows, shoulders and knees (with sum range 0-28) was performed; In which a Power Doppler ultrasound (PDUS) examination of 22 joints and GSUS examination for Effusion/ Hypertrophy (E/H) of 28 joints were performed[11].

Statistical analysis:

Analysis of data was done by personal computer using SPSS (Statistical program for social science) version 19. 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 (X2) 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:

This study included 100 patients (75% females and 25% males). Their ages ranged from 18 to 63 years with a mean of 42.32 ± 12.13. Age at onset of RA: ranged from 18-50 years with a mean of 35.7±11.8, 69% of patients were YORA (age at onset was 18-58 years), 31% were LORA (age at onset was 59-63 years). Disease duration ranged from 1-25 with a mean of 7.75±5.96.

Clinical characteristics of RA patients:

Our study included 25 males, their age ranged from 18-60years old with a mean of 34.16± 12.34, disease duration ranged from 1 to 25 years with a mean of 10.16±7.67, age at onset ranged from 18-40.

with a mean of 26.96 ± 10.18.

Table 1: Characteristic of patients with rheumatoid arthritis:

		Patients (no=100)
Age (years)	**-Range**	18-63
	- Mean ± SD	42.32 ± 12.13
Sex - Male - Female	 **n (%)** **n (%)**	 25 (25%) 75 (75%)
Disease duration	**- Range** **- Mean ± SD**	1-25 7.75±5.96
Duration of morning stiffness	**- Range** **- Mean ± SD**	0-180 74.94 ± 46.53
Disease onset: - Insidious - Gradual - Acute	 **n (%)** **n (%)** **n (%)**	 60% 30% 10%
Age at onset	**- Range** **- Mean ± SD**	18-50 35.7±11.8
Age at onset: YORA LORA	 **n (%)** **n (%)**	 69 (69%) 31 (31%)
Marital status - Single - Married - Widow - Divorced	 **n (%)**	 3 (3%) 90 (90%) 5 (5%) 2 (2%)
Occupation - employed - Manual - farmer - Professional - Housewife	 **n (%)**	 6 (6%) 5 (5%) 5 (5%) 5 (5%) 75 (75%)
Family history	**n (%)**	7 (7%)

YORA: young onset rheumatoid arthritis, LORA: late onset rheumatoid arthritis

Table 2: Comparison of disease characteristics between males and females:

		Patients (n=100)			
		Males n=25	**Females n=75**	**t/ x^2**	**P**
Age (years)	**-Range - Mean ± SD**	18-60 34.16 ±12.34	18-63 45.04 ±10.08	4.19	< 0.001**
Disease duration (years)	**-Range - Mean ± SD**	1-25 10.16 ±7.67	2-18 6.94 ±5.07	2.391	0.019*
Duration of Morning stiffness (minutes)	**-Range - Mean ± SD**	0-120 61.31±46.06	0-180 78.86±46.26	1.45	0.149
Age at onset	**-Range - Mean ± SD**	18-40 26.96 ± 10.18	20-50 38.64±10.93	4.70	< 0.001**
Disease onset					
Insidious	**n (%)**	20 (80%)	40 (53.3%)	56.73	< 0.001**
Gradual	**n (%)**	3 (12%)	27 (36%)	52.72	< 0.001**
Acute	**n (%)**	2 (8%)	8 (10.7%)	0.56	0.45
Marital state					
Married	**N (%)**	25 (%)	65 (86.6%)	1.4	2.03
Single	**N (%)**	0 (0%)	3 (4%)	2.26	1.42
Widow	**N (%)**	0 (0%)	5 (6.6%)	2.32	1.51
divorced	**N (%)**	0 (0%)	2 (2.6%)	2.1	1.43
Occupation					
Employee	**N (%)**	6 (24%)	0 (0%)	95.25	0.043
Farmer	**N (%)**	9 (36%)	0 (0%)	10.18	0,24
Professional	**N (%)**	5 (20%)	0 (0%)	2.25	0.17
Manual	**N (%)**	5 (20%)	0 (0%)	2.25	0.17
Housewife	**N (%)**	0 (0%)	75 (100%)	10.14	<0.001**
Family history	**n (%)**	0 (0%)	7 (9.3%)	2.51	0.11

Table 3: Patient characteristics in YORA and LORA:

		YORA (n=69)	LORA (n=31)	t/ x^2	P
Age (years)	**-Range** **- Mean ± SD**	18-58 36.23±9.09	59-63 59.41±.992	14.12	<0.001**
Disease duration (years)	**-Range** **- Mean ± SD**	1-20 6.82 ±5.58	1-25 9.80±6.33	2.36	0.020*
Duration of Morning stiffness (minutes)	**-Range** **- Mean ± SD**	0-120 50.18 ± 25.88	60-180 118.06 ± 43.08	9.088	<0.001**
Onset of disease: Insidious Gradual Acute	 **n (%)** **n (%)** **n (%)**	 45 (65.2%) 16 (23.2%) 8 (11.6%)	 15 (48.4%) 14 (45.2%) 2 (6.5%)	 2.07 2.18 2.01	 0.34 0.33 0.15
Sex Males Females	 **n (%)** **n (%)**	 7 (10.1%) 62 (89.9%)	 18 (58.1%) 13 (41.9%)	 0.74 0.39	 0.46 0.55
Marital state: -Married -Single -Widow -Divorced	 **n (%)** **n (%)** **n (%)** **n (%)**	 60 (86.9%) 3 (4.3%) 4 (5.8%) 2 (2.9%)	 30 (96.7%) 0 (0%) 1 (3.2%) 0 (0%)	 1.43 2.75 4.24 1.78	 0.83 0.43 0.24 0.17
Occupation -Employee -Farmer -Manual -Housewife	 **n (%)** **n (%)** **n (%)** **n (%)**	 0 (0%) 3 (3.34%) 4 (5.79%) 62 (89.85%)	 6 (19.35%) 6 (19.35%) 1 (3.22%) 13 (41.93%)	 1.43 1.87 2.24 1.56	 0.83 0.17 0.24 0.82
Family history	**n (%)**	5 (7.2%)	2 (6.4%)	0.02	0.88

*significant p value <0.05,
**High significant P value < 0.001, YORA: younger onset rheumatoid arthritis,
LORA: late onset rheumatoid arthritis

Table 4: Frequency of joint involvement in RA patients

JOINT involvement	Patients (n=100)
PIP	62%
1st PIP	2%
2nd PIP	25%
3rd PIP	23%
4th PIP	7%
5th PIP	5%
MCP	88%
1st MCP	7%
2nd MCP	30%
3rd MCP	36%
4th MCP	8%
5th MCP	7%
Wrist	52%
Elbow	16%
Shoulder	12%
Hip	18%
Knee	45%
Ankle	25%
Midtarsal	9%
MTP	51%
1st MTP	7%
2nd MTP	14%
3rd MTP	4%
4th MTP	9%
5th MTP	17%
TMJ	47%
SCJ	5%
ACJ	5%
Cervical spine	40%

MCP= metacarpophalengeal joint, MTP = metatarsophalangeal joint, PIP = proximalinterphalengeal joint, TMJ= temporomandibular joint, SCJ= sternoclavicular joint, ACJ= acromioclavicular joint.

Table 5: Frequency of joint involvement in YORA and LORA:

JOINT involvement	YORA (n=69)	LORA (n=31)	x^2	P
	n %	n %		
PIP	50 (72.5%)	12 (38.7%)	16.68	<0.001*
1st PIP	2 (2.9%)	0 (0%)	1.16	0.56
2nd PIP	20 (28.9%)	5 (16.1%)	1.57	0.46
3rd PIP	18 (26.1%)	5 (16.1%)	1.06	0.30
4th PIP	5 (7.2%)	2 (6.5%)	1.18	0.27
5th PIP	5 (7.2%)	0 (0%)	1.02	0.29
MCP	62 (89.9%)	26 (83.9%)	25.25	<0.001*
1st MCP	6 (8.7%)	1 (3.2%)	0.92	0.009*
2nd MCP	19 (27.5%)	11 (35.5%)	1.01	<0.001*
3rd MCP	25 (36.2%)	11(35.5%)	0.92	0.009*
4th MCP	6 (8.69%)	2 (6.5%)	3.01	0.55
5th MCP	6 (8.7%)	1(3.2%)	0.87	0.34
Wrist	45 (65.2%)	7 (22.6%)	1.26	0.36
Elbow	9 (14.3%)	7 (22.6%)	4.21	0.06
Shoulder	3 (4.3%)	9 (29%)	17.46	<0.001*
Hip	6 (8.7%)	12 (38.7%)	0.79	0.39
Knee	32 (46.3%)	13 (41.9%)	4.81	0.02*
Ankle	18 (26.1%)	7 (22.6%)	3.50	0.05*
Midtarsal	7 (10.1%)	2 (6.5%)	.35	0.55
MTP	38 (55.1%)	13 (41.9%)	21.88	<0.001*
1st MTP	4 (5.8%)	3 (9.7%)	9.82	0.002*
2nd MTP	10 (14.5)	4 (12.9%)	9.40	0.05
3rd MTP	2 (2.9%)	2 (6.5%)	10.25	0.03*
4th MTP	8 (11.6%)	1 (3.2%)	0.59	0.44
5th MTP	14 (20.3%)	3 (9.6%)	6.5	0.01*
TMJ	33 (47.8%)	14 (45.2%)	0.81	0.06
SCJ	3 (4.5%)	2 (6.5%)	2.36	0.12
ACJ	3 (4.5%)	2 (6.5%)	2.36	0.12
Cervical spine	15 (21.7%)	25 (80.6%)	1.52	0.22

MCP= metacarpophalengeal joint, MTP = metatarsophalangeal joint, PIP = proximalinterphalengeal joint. TMJ= temporomandibular joint, SCJ= sternoclavicular joint, ACJ= acromioclavicular joint YORA: younger onset rheumatoid arthritis, LORA: late onset rheumatoid arthritis
* Significant P value < 0.05. ** High significant P value < 0.001

Table 6: Frequency of different extra articular manifestation in RA patients:

Extra articular manifestation	Patients (n=100)
Secondary fibromyalgia	14%
Peripheral neuropathy	9%
Carpal tunnel syndrome	6%
Sjögren's Syndrome	4%
Rheumatoid nodules	4%
IPF	4%
Fever	3%
Raynaud's phenomenon	2%

Table 7: Common deformity in YORA and LORA:

Deformity	YORA (no=69)	LORA (no=31)	x^2	p
	No %	No %		
Ulnar deviation	14 (20.2%)	1 (3.2%)	4.82	0.02*
Swan neck	9 (13.04%)	3 (6.8%)	1.31	0.25
Boutonniere	8 (11.6%)	3 (6.8%)	0.95	0.33
Z shaped deformity of thumb	2 (2.9%)	3 (9.7%)	2.06	0.15

YORA: younger onset rheumatoid arthritis, LORA: late onset rheumatoid arthritis
* Significant P value < 0.05.

Table 8: Medication features of YORA and LORA:

Medication	YORA (no=69)	LORA (no=31)	x^2	p
	No %	No %		
Hydroxychloroquine	60 (86.9%)	31 (100%)	0.02	0.57
Methotrexate	50 (72.5%)	13 (41.9%)	0.04	0.51
Leflunamide	23 (33.3%)	20 (64.5%)	0.52	0.52
Prednisone	42 (60.9%)	15 (48.4%)	0.09	0.83
Sulfasalazine	25 (36.2%)	13 (41.9%)	0.29	0.59
Etanercept	2 (2.9%)	1 (3.2%)	1.4	0.24
Adalimumab	2 (2.9%)	0 (0%)	0.92	0.34
Tocilizumab	3 (4.3%)	0 (0%)	1.4	0.24

YORA: younger onset rheumatoid arthritis, LORA: late onset rheumatoid arthritis

Table 9: Radiographic and ultrasonographic scores in YORA, LORA:

		YORA (no=69)	LORA (no=31)	t	P
US DAS	**Range**	2.2-4.50	3.2-6.60	0.78	0.44
	Mean ± SD	18.15±11.94	20.16±11.57		
-Synovial hypertrophy score	**Range**	3-20	2-18	0.36	0.75
	Mean ± SD	7.87±3.75	7.51±3.21		
-Effusion score	**Range**	2-19	2-20	0.32	0.75
	Mean ± SD	7.43±4.31	7.67±3.85		
-PDS score for synovitis	**Range**	0-18	0-22	0.42	0.68
	Mean ± SD	9.77±4.50	10.21±5.21		
Erosion count	**Range**	0-16	0-12	1.32	0.19
	Mean ± SD	4.52±4.04	5.64±3,36		
SENS	**Range**	0-23	0-29	0.31	0.758
	Mean ± SD	12.69±6.16	12.82±5.98		
-Erosion count	**Range**	0-15	0-13	2.93	0.003*
	Mean ± SD	6.10±3.28	5.96±3.18		
	No (%)	52 (75.3%)	15 (48.3%)	7.04	0.008*
-Joint space narrowing count	**Range**	0-14	0-18	6.36	<0.001**
	Mean ± SD	5.51±2.90	6.92±3.99		

SENS: simple erosion narrowing scale, US DAS: ultrasound disease activity score.
*Significant P value < 0.05. ** High significant P value < 0.001 YORA: younger onset rheumatoid arthritis, LORA: late onset rheumatoid arthritis

Table 10: Comparison between YORA and LORA according to DAS28 and US DAS grades:

		YORA (n=69)		LORA (n=31)		x^2	P value
		NO	%	NO	%		
US DAS grade	**Remission**	3	4.4%	2	6.5%	0.19	0.65
	Low disease activity	15	21.34%	8	25.8%	1.2	0.27
	moderate disease activity	45	65.2%	11	35.5%	0.03	0.88
	High disease activity	6	8.7%	10	32.3%	3.21	0.07
DAS 28	**Remission**	7	10.1%	0	0%	3.38	0.066
	Low disease activity	15	21.7%	6	19.3%	0.073	0.87
	moderate disease activity	41	59.4%	16	51.6%	0.18	0.66
	High disease activity	6	8.7%	9	29%	6.93	0.008*

*Significant P value < 0.05. Us DAS: ultrasound grade disease activity score, DAS28: disease activity score. YORA: younger onset rheumatoid arthritis, LORA: late onset rheumatoid arthritis

Discussion

In our study majority of patients were females (75%) with (25%) were males. This was similar to the study done by Jamal et al., [12] from Al Qassim region that estimated RA to be more prevalent in females 77% (out of 3,985 patients) than in males, also this was in agreement with the study reported by Abdel-Nasser et al., [13] study was conducted in Makosa village showed that the prevalence of RA was more common

among females (20.53%) than males (11.84%), also Duraj et al.,[14] reported that RA was 4.5 times more common in women than in men. In other European study, that showed resemblances with ours, with a large proportion of Caucasians, the percentage of females population varies from 64.3% (Irland) to 88% (Serbia) Sokka et al.,[15]. In other countries (Hungry, Serbia, Poland, Rusia), women with RA represent more than 80% of the analyzed study groups Sokka et al.,[16]. In a study done by Scott et al.,[17] in colombian patients they found disease prevalence was 0.15% and 81.8% of these patients were women (out of 1364 patients).

The age of our RA patients ranged from 18 to 63 years with a mean of 42.32 ± 12.13. This was close to a study done by Mogosan et al.,[18] in which the mean age was 42.13 ± 11.44 years, they found that the average age of patients was 53.2 ± 13.9 years old, but it was different from the study done by Hochberg et al.,[19] as the age of their patients ranged from 40-59 years, with a mean of 51 ± 51.3 years.

Mean age of our female patients was 45.04± 10.08, ranged from 18 – 63yr. this was in accordance with a study done by Ghozlani et al.,[20] who study 136 females patients with RA, their age ranged from 27 to 64 years.

In our study we found that the commonest joint affected was MCP in about 88% of cases. This confirms results reported by Mathew et al.,[21], as they found the most commonly affected joint was MCP in records from over 11 900 patients suffering from RA. In our study the most common involved MCPs joints were 2nd and 3rd MCPs this was similar to a study done by Backhaus et al.,[22]. Sternoclavicular and acromiclavicular joints were the least affected joints (5%) in our patients. This was in concordance to a studies done by Yood and Goldenber[23] which reported that radiographic changes in AC changes not commom (1%).

According to age at onset of disease, our patients were divided into two groups: YORA (up to 58 years old) and LORA (> 58 years old). In our study the disease duration was more longer in LORA than in YORA (9.80 ± 6.33 years in LORA, 6.82 ± 5.58 in YORA with P = 0.02), this was similar to the study done by Rasch et al.,[24] which showed that duration of illness was longer in LORA than in YORA (9.95±3.2 years in LORA, 4±3.3 years in YORA with P = 0.003) and also our study was in agreement with the study done by El-Labban et al.,[25] which showed that disease duration was longer in EORA than in YORA. Since LORA is difficult to diagnose exactly, it takes a long time to be sure of the definite diagnosis. Meanwhile, we found that the disease duration was longer in LORA than in YORA.

As regard to morning stiffness duration, we found that LORA group had more morning stiffness duration, this was similar to a study done by Pease et al.,[26] found that LORA patients had longer morning stiffness than that in YORA patients and El-Labban et al.,[25] found that EORA group had increase morning stiffness duration. In our study, most patients had insidious onset of disease whether they were YORA or LORA, this was in contrast to a study done by Terkeltaub et al.,[27] showed that the acute onset of disease occurred more frequently in those with LORA

In our study we found that PIP, MCP and MTP joints were more commonly involved in YORA than in LORA (72%, 89.9%, 55%) respectively and shoulder involvement was found in 29% of LORA patients, this was in agreement with a study done by Turkcapar et al.,[28] showed that shoulder involvements more in LORA, also El-Labban et al.,[25] study showed shoulder involvements in EORA was found in 18.7%, PIP, MCP, elbow, MTP and ankle joints were more commonly involved in YORA than in EORA.

In conclusion this study demonstrates

- In Minia governorate, RA was more common in middle aged females, most patients had insidious onset and moderate disease activity, MCPs were the most commonly affected joints, MTX and HCQ were the most widely used treatment.
- Late onset RA had higher DAS28, less disabling and less erosive disease than YORA.
- Female patients had more active, more disabling and less erosive disease than males.

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