

# Spectrum of Rheumatic Diseases in Egypt is Similar/Different from that in Non-Arabic Countries: An Inpatient Comparison

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## Research Article

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### ABSTRACT

**Background:** Rheumatologic diseases are the most prevalent diseases worldwide. About one-third of physical disabilities in elderly are due to rheumatologic etiological disorders as a primary cause. They are one of the main causes of disability and morbidity all over the world with great impact on the quality of life.

**Aim:** The aim of this study was to examine the profiles of rheumatic diseases of the admitted patients to Assiut University hospital and to compare them with that of non-Arabic countries.

**Material and Methods:** Descriptive study of 939 patients with rheumatologic diseases during the period study (from January 2011 and April 2014). Diagnosis of the patients was done after fulfilling ACR/EULAR diagnostic criteria of each disease and required investigations were also done for verifying related diagnosis.

**Results:** The total number of patients was 939, with (79.1%) female predominance. Age ranged from 7-79 years with a mean  $\pm$  SD 38  $\pm$  15.32. Rheumatoid Arthritis (RA) was presented in 36.8%, Systemic Lupus Erythematosus (SLE) in 14.3%, Crystal Arthropathy in 11.7%, Seronegative Spondyloarthropathy (SpA) in 10.3%, Behçet disease (BD) in 8.3%, Juvenile Idiopathic Arthritis (JIA) in 6.4%, Systemic Sclerosis (SSc) in 5.8%, Overlap Syndrome in 2.9%, Antiphospholipid Syndrome (APS) in 0.3% and Adult onset Still's Disease in 0.3%.

**Conclusion:** Rheumatoid arthritis was the most common rheumatologic disease followed by Systemic Lupus Erythematosus in admitted patients of the Rheumatology, Rehabilitation, and Physical Medicine Department, Assiut University hospital.

## INTRODUCTION

Rheumatologic diseases are the most prevalent diseases worldwide<sup>[1]</sup>. To identify the burden of the disease it is important to know their prevalence and demographics<sup>[2-4]</sup>. The prevalence of rheumatic disorders ranges in different studies from 11% to more than 50%<sup>[5,6]</sup>. This prevalence varies depending on environmental factors and ethnicity<sup>[7-9]</sup>. About one-third of physical disabilities in elderly are due to rheumatologic etiological disorders as primary causes<sup>[10]</sup>. In the developed countries musculoskeletal disorders are the cause of huge numbers of lost working days, big amount of compensatory disability allowances, the cost of drugs and reduction of work output<sup>[11]</sup>.

### Aim

The aim of this study was to examine the rheumatic disease profile of the admitted patients at the Rheumatology, Rehabilitation, and Physical Medicine Department, Assiut University hospital and to compare that with non-Arabic countries.

## Material and Methods

This descriptive, retrospective study was conducted on admitted patients at the Rheumatology, Rehabilitation and Physical Medicine Department, Assiut University Hospital between January 2011 and April 2014. Assiut Governorate is considered as the capital of Upper Egypt. Referral of rheumatologic cases is done from all Upper Egypt and Red Sea Governorates to Assiut University Hospital because it is considered as the main and biggest center in Upper Egypt. Diagnosis of cases was done by history, clinical examination, and laboratory investigations according to each case. Then, the disease activity was assessed and treatment plan was initiated.

Rheumatoid arthritis (RA) cases were diagnosed according to ACR/EULAR (2010) [12]. Systemic lupus erythematosus patients (SLE) were diagnosed by using the 1997 updates of 1982 Revised ACR Classification Criteria for SLE and the 2012 Systemic Lupus International Collaborating Clinics classification criteria for SLE (SLICC) [13,14]. Assessment of SpondyloArthritis international Society (ASAS) was used to diagnose seronegative spondyloarthropathy (SPA) [15]. Systemic sclerosis (SSc), juvenile idiopathic arthritis (JIA), Behçet's disease (BD), Mixed connective disease (MCTD), Antiphospholipid syndrome (APS) and Sjögren syndrome were diagnosed according to clinical diagnostic criteria for each disease entity [16-21].

For Polymyositis (PM), Dermatomyositis (DM), and overlap syndromes, appropriate clinical features, muscle, skin biopsy, and autoantibodies were done for diagnosis. For crystal-induced arthritis, the diagnosis was made by clinical presentation, laboratory investigations (serum uric acid) and sometimes examination of synovial fluid by the use of polarized light microscopy was done when needed.

In our study, we only included the diagnosed cases and we excluded another undiagnosed one. These cases were about 420 cases and we didn't include them in the study as they didn't fulfill any criteria of diagnosis of any rheumatological disease. Osteoarthritis cases were not included as they were not admitted and were diagnosed and followed up in the outpatient clinics. Patients were admitted on a regular basis to receive unafforded medications as pulsed therapy in lupus nephritis. They were also admitted when they need investigations either laboratory or radiology, to reach the final diagnosis.

## Data Management and Data analysis

This descriptive, retrospective study was conducted on admitted patients at the Rheumatology, Rehabilitation and Physical Medicine Department, Assiut University Hospital between January 2011 and April 2014. Assiut Governorate is considered as the capital of Upper Egypt. Referral of rheumatologic cases is done from all Upper Egypt and Red Sea Governorates to Assiut University Hospital because it is considered as the main and biggest center in Upper Egypt. Diagnosis of cases was done by history, clinical examination, and laboratory investigations according to each case. Then, the disease activity was assessed and treatment plan was initiated.

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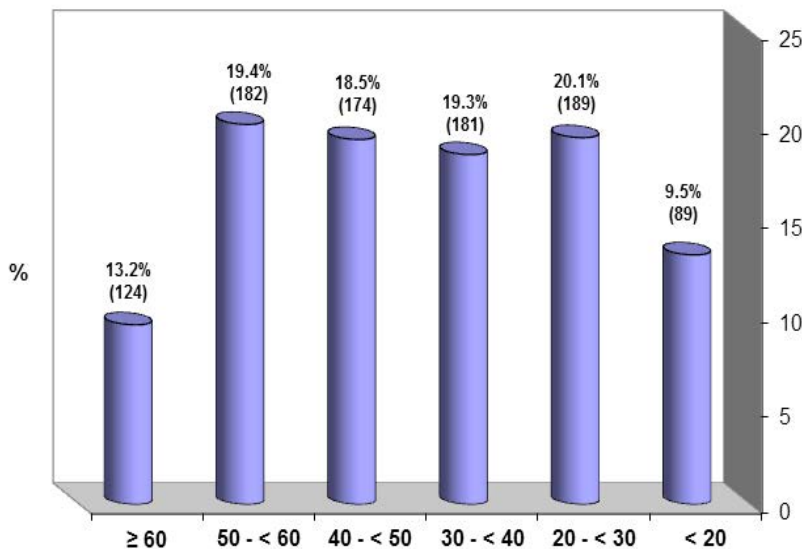
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Medical profiles were retrieved from the electronic database of the department of Rheumatology, Rehabilitation, and Physical Medicine after approval of the ethical committee of the university hospital. Data registration was done by staff members of the department and data entry was done by secretaries', and data were tabulated. The data abstracted included age, sex, diagnosis, number of admissions and total duration of hospital stay. Age was written by a completed years. Data was analyzed by using the advanced Statistical Package for Social Sciences (SPSS) program version 1. The analysis was started by descriptive statistics (frequencies and percentages) then application of tests of significance as Chi-square test for comparison of qualitative data. P-value was considered statistically significant when it was less than 0.05. Privacy and confidentiality of all information were maintained.

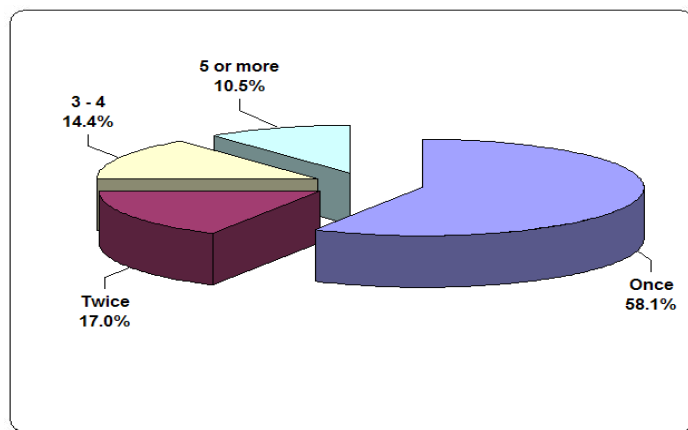
## RESULTS

A total number of the admitted diagnosed rheumatologic patients were 939, where females were 743 (79.1%) and males were 196 (20.9%). Their age ranged from 7-79 years with a mean  $\pm$  SD 38 $\pm$ 15.32 (**Figure 1**). Age more than 20 years to less than 60 years was presented in (85%) of cases.

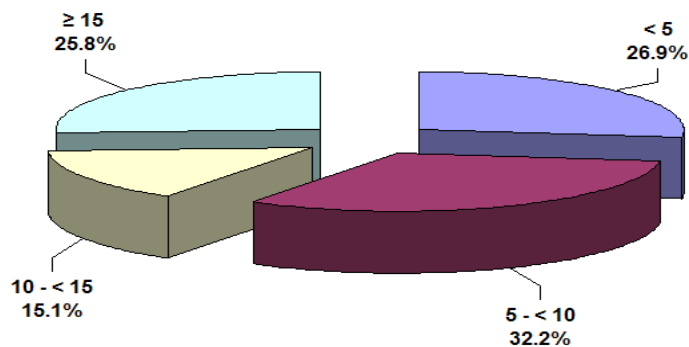


**Figure 1:** Age distribution among admitted Rheumatologic patients in Rheumatology, Rehabilitation, and Physical Medicine department, Assiut University hospitals, 2011-2014.

Eighty-five percent of patients were admitted once in a period of 4 years, while 10.5% had 5 or more admissions, where 27% of them had hospital stay for less than 5 days and 25% admitted for  $>15$  days (**Figures 2 and 3**).



**Figure 2:** Number of admissions among admitted Rheumatologic patients in Rheumatology, Rehabilitation, and Physical Medicine department, Assiut University hospitals, 2011 -2014.



**Figure 3.** Hospital stay duration among admitted Rheumatologic patients in Rheumatology, Rehabilitation, and Physical Medicine department, Assiut University hospitals, 2011 -2014.

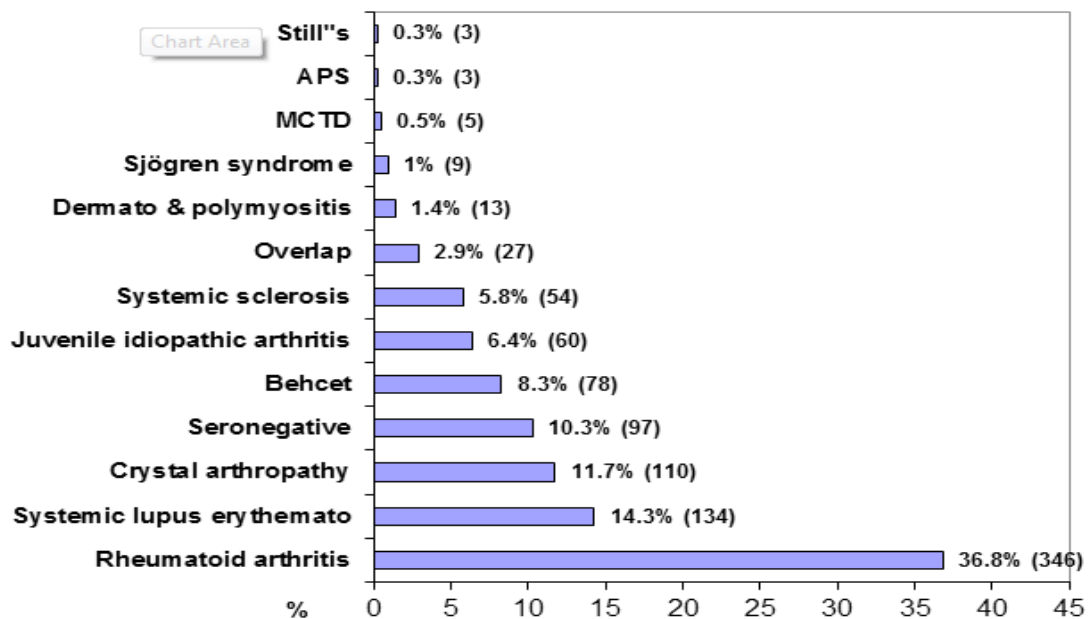
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Among all age groups, one time admission was recorded in more than half of cases, where 66.9% was present in 40-50 years, but 46.7% of the cases were present in age group from 20 to <30 years admitted more many times Twice admissions were higher among  $\geq 60$  years (22.5%) while they have the lowest percent of 5 admissions or more (4.5%). 3-4 admissions were 17.7% of the age group <20 years and lowest among 10.1% of the group >60 years. These differences are highly significant ( $<0.0001$ ).

About 34% of the group aged 30 to <40 years had hospital stay <5 days. 34% of the group aged 20 to <30 years had hospital stay  $\geq 15$  days. 16.1% of the age <20 years had a hospital stay 10 to <15 days. The age group >60 years, 43.8% had 5-<10 while the lower percent (21.3%) of them had a hospital stay  $\geq 15$  days. These differences with statistical significance ( $p=0.017$ ).

The percentage of admitted males and females once were 56.6% and 58.4% respectively, 10.7% and 10.5% of them were admitted for 5 times and more with no significant differences between numbers of admissions of both sexes. The same was found regarding the hospital stay duration.

Rheumatoid arthritis patients comprised 36.8% of patients. SLE was 14.3% while JIA was 6.4%. Only three cases with APS and three with Still's disease were admitted all over the study period (**Figure 4**).



**Figure 4.** Distribution of admitted Rheumatologic patients in Rheumatology, Rehabilitation, and Physical Medicine department according to diagnosis, Assiut University hospitals, 2011-2014.

Female to male ratios in RA and SLE were 8.6:1 and 18.1:1 respectively, in the case of Crystal arthropathy it was 4: 1 and less in SPA (1.8:1), while the ratios were 2:1 and 26:1 in JIA and SSc respectively. The reverse was observed in BD that male to female ratio was 3.9:1.

Rheumatoid arthritis was significantly higher in the age 50-<60 years (32.4% and  $p < 0.0001$ ), about 76% of them were aged from age 30 up to 60 years. SLE was significantly higher in the age from 20 up to 30 years (41%) and lower (2.2%) among those aged 60 years and more ( $p < 0.0001$ ). Crystal arthropathy was higher (41.8%) in those aged 50-<60 years and 30.8% of older while no cases among age less than 20 years ( $p < 0.0001$ ). The higher significant percent in SPA and BD were 28.9% and 41% in the age group 20 up to 30 years ( $p < 0.0001$ ). Juvenile idiopathic arthritis was 90% in those aged <20 years and 10% from 20 to <30 years. Differences were highly significant ( $p < 0.0001$ ) (**Table 1**).

**Table 1.** Distribution of admitted rheumatologic patients in rheumatology, rehabilitation, and physical medicine department according to diagnosis and number of admissions, Assiut University hospitals, 2011-2014.

Diagnosis	No. of admissions								P-value
	Once		Twice		3 - 4		5 or more		
	No.	%	No.	%	No.	%	No.	%	
Rheumatoid arthritis	240	69.4	58	16.8	34	9.8	14	4	0.000*
Systemic lupus erythematosus	41	30.6	28	20.9	30	22.4	35	26.1	0.000*
Crystal arthropathy	84	76.4	10	9.1	12	10.9	4	3.6	0.000*
Seronegative spondyloarthropathy	66	68	22	22.7	7	7.2	2	2.1	0.002*
Behçet disease	32	41	10	12.8	20	25.6	16	20.5	0.000*
Juvenile idiopathic arthropathy	31	51.7	7	11.7	14	23.3	8	13.3	0.134
Systemic sclerosis	30	55.6	11	20.4	4	7.4	9	16.7	0.221
Overlap syndrome	9	33.3	5	18.5	5	18.5	8	29.6	0.005*

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Dermato & polymyositis	6	46.2	4	30.8	2	15.4	1	7.7	0.595
Sjögren syndrome	2	22.2	2	22.2	4	44.4	1	11.1	–
Mixed connective tissue disease	1	20	1	20	2	40	1	20	–
Antiphospholipid	3	100	0	0	0	0	0	0	–
Still's disease	0	0	60	1.3	40	0.7	0	0	–

Once admission was highly significant higher than twice or more admissions in RA, SLE, Crystal arthropathy, SPA and BD ( $p < 0.0001$ ,  $p < 0.0001$ ,  $p < 0.0001$ ,  $p = 0.002$  and  $p < 0.0001$ ), a higher number of 5 admissions or more was in the case of SLE (**Table 1**).

Significantly higher percent of hospital stay in RA was from 5-<10 days (39% and  $p < 0.001$ ), while it was >15 days in SLE (50% and  $p < 0.0001$ ) and 5 to <10 days in SPA (41.2% and  $p = 0.011$ ). In BD 38.5% of them was admitted >15 days ( $p = 0.026$ ) (**Table 2**).

**Table 2.** Distribution of admitted rheumatologic patients in rheumatology, rehabilitation, and physical medicine department according to diagnosis and hospital stay, Assiut University hospitals, 2011-2014.

Diagnosis	Hospital stay (days)								P-value
	< 5		5 - < 10		10 - < 15		≥ 15		
	No.	%	No.	%	No.	%	No.	%	
Rheumatoid arthritis	115	33.2	135	39	41	11.8	55	15.9	0.000*
Systemic lupus erythematosus	19	14.2	22	16.4	26	19.4	67	50	0.000*
Crystal arthropathy	32	29.1	36	32.7	22	15.5	20	18.2	0.174
Seronegative spondyloarthropathy	32	33	40	41.2	12	12.4	13	13.4	0.011*
Behçet disease	16	20.5	18	23.1	14	17.9	30	38.5	0.026*
Juvenile idiopathic arthropathy	16	26.7	22	36.7	7	11.7	15	25	0.819
Systemic sclerosis	18	33.3	12	22.2	9	16.7	15	27.8	0.422
Overlap syndrome	3	11.1	6	22.2	3	11.1	15	55.6	0.004*
Dermato & polymyositis	1	7.7	6	46.2	3	23.1	3	23.1	0.361
Sjögren syndrome	1	11.1	2	22.2	2	22.2	4	44.4	–
Mixed connective tissue disease	0	0	0	0	2	40	3	60	–
Antiphospholipid	0	0	2	66.3	0	0	1	33.3	–
Still's disease	0	0	1	33.3	1	33.3	1	33.3	–

**Table 3.** Prevalence of selected disorders in selected studies in comparison to Egypt (Hospital based studies).

	Egypt	Italy22	Malaysia23	Bangladesh24	Bangladesh25	Nepal26	Burkina Faso27	Congo28	Iran29
Sample size	939	3,695	225	772	8975	337	4048	2370	5187
Rheumatoid Arthritis	36.8	23.1	47.1	27.7	4.09	20.17	2.84	3.5	11.81
Systemic Lupus Erythromatosis	14.3	3.4	4	1.3	0.21	2.07	0.6	0.9	1.44
Calcium Pyrophosphate diseases	9.4	-	-	-	-	-	-	-	0.26
Seronegative Spondyloarthropathy	10.3	1.2	-	3.7	-	1.18	1.98	7.6	-
Juvenile idiopathic arthropathy	6.4	-	4.9	-	1.1	0.59	0.34	0.5	0.61
Systemic sclerosis	5.8	1.1	1.3	0.2	-	0.59	-	0.6	0.38
Dermato & Polymyositis	1.4	-	-	0.6	-	-	0.07	0.05	0.09
Sjogren syndrome	1	1.8	-	-	0.02	-	0.07	-	0.11
Gout	2.3	1.9	5.8	2.1	0.36	3.85	0.66	9.3	1.82
Still's	0.3	-	-	-	-	-	0.15	-	0.09

In comparing our results with other countries we included hospital-based studies in seven countries either in and outpatients as in the Italian study [22], outpatient rheumatology clinics in Malaysia, Bangladesh 2014 [23,24], Bangladesh 2009 [25], Nepal [26], Congo [27,28] and Iran [29]. Only Burkina Faso [27] was inpatients only as our study.

We excluded all population-based studies from our comparison. **Table 3** showed the comparison between our results and eight different studies in seven different countries.

## DISCUSSION

The prevalence of rheumatologic disorders in developing countries is unknown. A joint meeting of the World Health



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Organization (WHO) and International League of Associations for Rheumatology (ILAR) in Geneva was held to start a world program which was called community-oriented programme for control of rheumatic diseases (COPCORD) <sup>[30,31]</sup>, the aim of this program was to give an idea about the burden of musculoskeletal (MSK) disorders in developing countries <sup>[32]</sup>. According to a study on 2006, MSK disorders contributed about 3.4% in developing countries <sup>[33]</sup>.

In this study, we tried to describe the commonest admitted rheumatologic diseases in Rheumatology, Rehabilitation, and Physical Medicine Department, Assiut University Hospitals, Egypt, although this may not reflect the true prevalence in our society and compare these results with non-Arabic countries. There are differences in the prevalence of diseases in our Egyptian study and eight hospital-based studies in seven countries. The Italian study is six centers for all in and outpatients aged more than 16 years between May 1 and December 31, 1996 <sup>[22]</sup>. The Malaysian study was conducted in attendance of rheumatology clinic a hospital University from January 1986 to December 1987 <sup>[23]</sup>. The Bangladesh study was a retrospective one done at a rheumatology clinic from July 2009 to December 2012 <sup>[24]</sup>. Other Bangladesh study was done among patients attending the rheumatology clinic of Physical Medicine and Rehabilitation Department, between January and June 2006 <sup>[25]</sup>. In a Nepal study in Rheumatology clinic at Manipal Teaching Hospital from September 2001 to September 2004 <sup>[26]</sup>. In Burkina Faso, a retrospective study was conducted from March 2006 to March 2011 inpatients at a University Hospital <sup>[27]</sup>. In the Iranian study, a retrospective study of referred patients to two main rheumatology clinics from March 2009 to February 2010 <sup>[28]</sup>. In Congo, a retrospective study was done from the records of the attendants of a rheumatology clinic in the period from 1988 to 2002 <sup>[29]</sup>.

In our study the age ranged from 7-79 with a mean 38.05 with female predominance 79.1% in a female: male ratio of 3.79:1. This was similar to a study held in Iran <sup>[28]</sup> and Malaysia <sup>[23]</sup> in which the mean age was 38.57 and 39.4 respectively, but a study by Akm et al. <sup>[24]</sup> the mean age was 46.9 <sup>[24]</sup>.

Our study showed female predominance in a ratio of 3.79:1, in Malaysian study <sup>[23]</sup> it was 3.6 :1, in Italian study it was less 2.8:1 <sup>[22]</sup> and much less in a study in Bangladesh 2014 1.3:1 <sup>[24]</sup>. A similarly study in Congo <sup>[29]</sup> 1.2:1 but on the contrary another study was done in Bangladesh 2009 <sup>[25]</sup> showed male predominance 1.3:1.

The prevalence of RA is about 1% worldwide <sup>[34-36]</sup>. There is great variability in RA prevalence based on populations <sup>[36]</sup>. In some studies, there was an evidence of a decrease in the incidence of RA in the last decades in Europe and America, especially in females with a shift of peak of onset to older age groups <sup>[37,38]</sup>. On the contrary in developing countries, there was the rise of the incidence with a peak onset in childbearing females <sup>[34,39,40]</sup>.

In our study the percentage of RA was 36.8% with female : male ratio 8.1:1, while a study by Akm et al. <sup>[24]</sup> done in Bangladesh, found that the prevalence of RA was 27.7% with female : male ratio 2.5:1 <sup>[24]</sup> and Suzon et al. also in Bangladesh 2009 reported that RA was 4.09 and female : male ratio 4.5:1 <sup>[25]</sup>. A study done in Italy RA was 23.1%, much higher in Malaysia <sup>[23]</sup> 47.1%, decreased in Nepal <sup>[26]</sup> 20.17%, than Iran <sup>[29]</sup> 11.81%, 3.5% in Congo <sup>[28]</sup> lastly Burkina Faso <sup>[27]</sup> 2.84%.

The second commonest disease in our study was SLE (14.3%) with a female to male ratio of 18.1:1. Other studies showed much less prevalence of SLE. In the study of Akm et al. <sup>[24]</sup> the prevalence was 1.3% with female to male ratio of 10:1 <sup>[24]</sup>. Another study in Bangladesh 2009 the prevalence was 0.21% <sup>[25]</sup>. In a study done in two outpatient clinics in Iran in 2011, it was found that SLE contributes 1.44% of all rheumatologic diseases with 92% female predominance <sup>[29]</sup>. In Italy, it was 3.4% <sup>[22]</sup> in Malaysia, it was 4%.

Crystal arthropathy was the 3rd commonest disease in our study which recorded 11.7% and female to male ratio of 4:1 (9.4% calcium pyrophosphate and 2.3% gout. On the other hand, a study in Iran revealed that calcium pyrophosphate contributed about 0.26% while gout was 1.82%. Suzon et al. reported that gout prevalence was 3.02% with male predominance in a ratio of 1.9 : 1 <sup>[25]</sup>. In Congo, gout prevalence was much more reaching 9.3% <sup>[29]</sup>.

Seronegative spondyloarthropathy was 10.3% in this study with a female to male ratio 1.8 :1. This group included ankylosing spondylitis (AS), undifferentiated SPA, psoriatic arthritis (PsA) and reactive arthritis. In Congo study, SPA prevalence was 7.6% <sup>[28]</sup>. Owlia et al. reported that SPA patient contributed 2.57% <sup>[28]</sup>. Most of the studies recorded only AS and PsA. In Akm et al. <sup>[24]</sup> study, AS and PsA the prevalence were 2.2% and 1.5% and the male predominance of 1:3.3 and 1:1.4 respectively <sup>[24]</sup>.

In the current study, Behçet's disease was 8.3% with male predominance in a ratio of 1:3.9. In the year 2011, a study found that the prevalence was 0.50% with male predominance in a ratio of 1:1.36 <sup>[29]</sup>.

As regarding JIA, its percentage was 6.4% with female predominance in a ratio of 2:1. While in the study done by Owlia the prevalence was 0.61% among all rheumatologic diseases <sup>[28]</sup>, while in Malaysia <sup>[23]</sup> it was 4.9%, Congo <sup>[28]</sup> 5%, Nepal <sup>[26]</sup> 0.5%, and Burkina Faso (27) 0.34%.

The SSc patients in our study were 5.8% with a female predominance. In Italy <sup>[22]</sup> it was 1.1%, Malaysia <sup>[23]</sup> 1.3%, Bangladesh <sup>[24]</sup> 0.2%, Nepal <sup>[26]</sup> 0.59%, Congo <sup>[28]</sup> 0.6% and Iran <sup>[29]</sup> 0.38%.

Dermatomyositis, polymyositis, sjogren and still's disease were the least prevalence in our study.

Since this is a hospital-based study, it is limited by the use of a bias population. The population at risk is seldom known and

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hospital-based studies usually give a lower prevalence rate. Advantages of such a study are that it is based on more accurate diagnosis; hospital statistics are particularly useful for the supply of data on rare diseases since it covers a wider population and it gives an indication of the relative incidence of the rheumatic disease. A better picture would be obtained if the attendances of patients at more than one hospital are used.

### CONCLUSION

Musculoskeletal disorders are a major problem in our community. Rheumatoid arthritis was the most common rheumatologic disease followed by SLE, adult Still's disease and APS are the least common diseases. SLE patients were found to have the most frequent admissions of all patients as well as the longest hospital stay.

### RECOMMENDATION

The rheumatologic service is inadequate due to low priority is given by the authority. We recommend awareness to people with the adequate teaching of rheumatologic diseases to the undergraduates with good clinical training aiming to reach early diagnosis and planning of treatment to avoid complications and decreasing disability, morbidity, and mortality.

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