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To Determine the Various Co-Morbidities Associated with Different Rheumatic Diseases

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ABSTRACT

Background: Rheumatic diseases have many consequences, but the symptoms of additional diseases associated with these diseases, called comorbidities, are less understood. It is important to recognize such diseases and include them in individual patient care. There is little research on various comorbidities associated with rheumatic conditions. Aim: This study was held to evaluate various rheumatic diseases and their frequency, associated comorbidities and changes depending on BMI and age. **Methods:** This cross-sectional study was designed to examine 1,000 more patients who were diagnosed with rheumatic diseases due to comorbidities in our facility. Patients of any sex ≥ 18 years were included. Demographic data, diagnostic data and associated diseases were collected. The analysis was performed using IBM SPSS version 17.0 and R version 3.4, and the relationship between rheumatic disease and comorbidities and age and BMI was analysed using the Chi-square test. Place and Duration: In the Medicine Unit II of Madina Teaching Hospital Faisalabad for one year duration from January 2018 to January 2019. **Results:** We found that rheumatic disease and co-morbidities were significantly increased with body mass index and age ($p < 0.005$). A substantial fraction (45%) of patients with rheumatic diseases was noted to have comorbidities. The most common of these are hypertension, hypothyroidism and diabetes, respectively. **Conclusion:** Co-morbidities sensitive to therapeutic measures are common in people with rheumatic diseases. Early detection of this comorbid condition is beneficial, rheumatology should be an integral part of patient care.

Keywords: Age, body mass index, co-morbidities, questionnaire, rheumatic diseases.

INTRODUCTION

Patients with rheumatic diseases (RD) are not only at high risk of developing comorbidities, but also have a high incidence of comorbidities.[1] Patients with RD often have at least one or more concomitant conditions and may be associated with persistent inflammatory activity or disease-related organ damage.[2] These comorbidities may be related to or completely independent of RD or its treatment alone. Lifestyle choices or physical inactivity can subsidize to comorbidities. Comorbidities in RD can affect the primary disease in different ways; affecting the life quality and affecting the effectiveness of treatment. Achieving remission and low disease activity can reduce comorbidities often associated with RD.

However, the risk-benefit ratio should be considered when achieving such goals. Some of the common RD associated conditions are anaemia, osteoporosis, bacterial infection, lymphoma, gastrointestinal ulceration, myocardial infarction, heart failure, stroke, hypothyroidism, depression, fractures, skin cancer and all types of cancer.[3,4] Heart disease remains a serious problem in patients with RD, and rheumatoid arthritis patients have a 50% high cardiovascular mortality (CV) risk compared to the over-all population5. Young onset RA patients are more prone of coexisting RA-related diseases such as CVD, CKD and osteoporosis. According to the COMORA study, co-morbidities associated with some RD; asthma (6.6%), depression (15%), cardiovascular events (stroke and myocardial infarction, 6%), COPD (3.5%), solid malignancies (excluding cancer), hyperglycaemia (3.3%), hyperlipidaemia (8.3%) and hypertension (11.2%). In addition, the metabolic syndrome incidence is higher in patients with RD than in the control group (39.8% vs. 20%). Anaemia, dyslipidaemia, leucocytosis, thrombocytosis, tuberculosis (TB) and infections of unknown organisms in ≥30% of patients with RA and additional symptoms in 61%.[7,8] In addition, more comorbidities in RE cause not only difficulties in treatment, but also intervene in treatment and increase treatment costs, disability, the likelihood of hospitalization and the risk of death. It is therefore important to recognize these comorbidities and consider treatment recommendations for the purpose and treatment goals that can be achieved with additional medication and frequent monitoring.[9] In previous studies, data on medical diseases associated with rare diseases mainly came from Western populations and no data from the Indian population.[10]

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MATERIALS AND METHODS

This cross-sectional study was held in the Medicine Unit II of Madina Teaching Hospital Faisalabad for one year duration from January 2018 to January 2019. Patients of any sex with pronounced musculoskeletal / RD disorder (according to the American College of Rheumatology) aged ≥18 years were included in the study and were able to cooperate. Patients who met the study criteria were interviewed by a doctor and information was entered into the computer. Interview with the patient included demographic questions about age, occupation, personal history (smoking, tobacco and alcohol consumption), family history of arthritis, comorbidities, drug allergies, and RD duration. The height and weight of each patient were measured and BMI calculated. In all patients, the doctor measured sitting blood pressure (BP) using a mercury sphygmomanometer. If the patient's arterial pressure was elevated, two additional measurements were taken with a few minutes between measurements. All this information has been entered into the database and recorded according to the unique definitions of hospital clinics given to each patient to prevent patient data from being saved again.

Comorbidity was defined as the presence of comorbid or comorbid diseases or disorders consistent with RD in our study. Co-morbidities associated with RD were included in the patient profile in accordance with previous patient reports. No tests have been performed to diagnose naive comorbidities. Data collected from patients was transferred to the Microsoft Excel database. To assess its effectiveness, a pilot study was held before the start of the study. The population mean age and the highest age with accompanying disease, and the ratio of RD were analyzed. Using SPSS version 17.0, the data analysis was performed and the relationship between the rarity of comorbid disease and age and BMI was analysed using the Chi-square test. The binary results are summarized using percentages, and continuous data are presented as S.D and mean. The percentage of different co-existing conditions in each RD was calculated.

RESULTS

1,000 patients were selected for this cross-sectional study; 188 men and 812 women were 1: 4 women. The patient's average age was 44.78, the total average BMI was 25 (11-47) kg / m2, and the average duration of RD was 3.62 years. Mean systolic and diastolic pressure were 136.5 ± 6.7 and 83.2 ± 7.2 mmHg, respectively. Average age, average BMI, male-female ratio, and average duration of disease in each group of patients with spondylitis (SpA), RA, systemic lupus erythematosus (SLE) and osteoarthritis (OA) were determined.

Table 1: Showing baseline characteristics of patient's (n=1000)

Mean Age(S.D)		M:F Ratio	BMI (S.D) mean	Illness duration in years
Spondyloarthritis (n=224), n (%)	38 (11)	68 (31):156 (69)	25 (5)	3.04 (3.75)
Systemic lupus erythematosus (n=91), n (%)	34(12)	6 (7):85 (93)	23 (4.9)	2.83(2.43)
Rheumatoid arthritis (n=493), n (%)	47 (12)	68 (14):425 (86)	25 (5)	3.97 (3.93)
Osteoarthritis (n=165), n (%)	50 (15)	45 (27):120 (73)	26 (5)	3.89 (3.66)

In this cross-sectional study, we observed 18 different RDs; RA, SpA, OA, SLE, gouty arthritis, Sjogren's syndrome, osteoporosis, scleroderma, mixed connective tissue disease, antiphospholipid antibody syndrome, rhupus syndrome, myositis, vasculitis, sarcoidosis, fibromyalgia, viral arthritis and soft tissue rheumatism. Most patients had RA (n = 493, 49.3%) followed by SpA (n = 224, 22.4%), OA (n = 165, 16.5%) and SLE (n = 91, 9.1 %) Study population. Among 1,000 patients with different RDs, 45% had one or more related comorbidities as shown in [Table 2].

Table 2: Percentage of total and various comorbidities.

Total comorbidities	45
Diabetes mellitus	15.4
Hypothyroidism	16.9
CAD	0.8
Hypertension	24.3
Interstitial lung disease	1.4
TB	0.6
NAFLD	0.6
Asthma	0.8
CKD	0.6
NSIP	0.5
Dyslipidemia	0.2
IDA	0.6
CNS involvement	0.3
Nephritis	0.5
Thalassemia	0.1
Uveitis	0.2
Nodular sclerosis of eye	0.1
APD	0.1
CLL	0.1
PAH	0.1

In 28.4% of patients 13.3% had two, 3.0% had three, and the remaining 0.2% had four comorbidities. Hypertension (24.3%) followed by hypothyroidism (16.9%), diabetes mellitus (DM, 15.4%), interstitial lung disease (ILD, 1.9%), asthma (0.8%) and ischemic heart disease were the most common comorbidities as shown in Table 2.

Of the four age groups studied, RD was often observed in 40– <60 (n = 488), followed by 20– <40 (n = 323) and age groups. Age ≥60 (n = 153). Comorbidities were more commonly seen in patients over 60 years (76.4%), followed by 40- <60 years

(50.2%) and 20- <40 years (25%). Patients in the group <20 years had the lowest incidence of RD and associated comorbidities, while comorbidities increased significantly with age (p <0.005).

Patients were divided into four groups to determine if BMI was a significant factor in RD and associated diseases. The BMI group was from 25 to 29.9 (36.1%), then the BMI group 18.5 to 24.9 (35.1%) and the BMI group ≥30 (20.6%). In patients with co-morbidities above ≥30 BMI (62.1%), 25-29.9 BMI groups (50.6%) and 18.5-24.9 BMI groups (34.7%) were more frequently observed. The BMI group <18.5 kg / m2 showed the lowest incidence of RD and associated comorbidities. This showed that the comorbidity was significantly increased at BMI (p <0.005).

Table 3: In four major rheumatic diseases, Comorbidity variations given

OA, n (%)		RA, n (%)	SpA, n (%)	SLE, n (%)
Hypothyroidism	27 (16.2)	98 (19.8)	21 (9.3)	1 (1)
Interstitial lung disease	1(0.6)	7(1.4)	-	-
Hypertension	83 (50.3)	123 (25)	42 (18.7)	15 (16)
Diabetes mellitus	47 (28.3)	80 (16.2)	30 (13.3)	10 (11.4)
CKD	1 (0.6)	3 (0.6)	-	2 (2.2)
Asthma	2 (1.2)	5 (1)	2 (0.8)	-
CAD	3 (1.7)	4 (0.8)	1 (0.4)	-
IDA	1 (0.6)	2 (0.4)	-	-
NSIP	-	4 (0.8)	-	-
NAFLD	-	3 (0.6)	1 (0.4)	1 (1)
Epilepsy	-	1 (0.2)	-	-
Schizophrenia	-	1 (0.2)	-	-
TB	-	-	6 (2.6)	-
Dyslipidemia	-	1 (0.2)	-	-
Uveitis	-	-	2 (0.8)	-
Thalassemia	1 (0.6)	-	-	-
Nodular sclerosis	-	-	1 (0.4)	-
CLL	-	-	-	1 (1)

[Table 3] shows the appearance of various comorbidities in four major RD, RA, SpA, OA and SLE in the study population.

DISCUSSION

This cross-sectional study was conducted to add information to limited data on the incidence of comorbidities after RD in Pakistan. In this study, among several DRs, RA formation was higher, followed by SpA, OA and SLE.[11] In a study conducted in Ogan, Nigeria, 472 cases of rheumatology included degenerative arthritis in 45.8% and connective tissue diseases in 4.9%. In addition, common rheumatic disorders include OA (28.8%), non-specific low back pain (11.9%), cervical spine (8.9%), lumbar spine (8.1%), and shoulder pain syndrome (7.6%) and so on. In a similar study in Belgium, common rheumatic disorders were inflammatory diseases of the joints and spine (42%), soft tissue rheumatism (37%), degenerative diseases of the joints and spine (36%), and diseases.[12] Bone metabolism (17%) among 3,751 patients with DR. Since this study was conducted in the rheumatology ward of the referral hospital, it appears that its appearance is biased towards inflammatory rare diseases. According to our study, 45% of RD patients had one or more comorbidities; Hypertension was the most common (24.3%) followed by hypothyroidism, DM, ILD, CAD and asthma. Kudial et al. A similar incidence has been reported in 130 women with rheumatic symptoms, with hypertension being the most common comorbid condition followed by anaemia, DM and other conditions.

This study also looked at the effects of age and BMI on comorbidities in patients with RD. Using chi-square analysis to our data, we found that RD and comorbidities increased significantly with age and BMI (P <0.005), respectively. This may be due to the effects of the disease. The age increase in co-morbidities was 76%, 50%, 25% and 16.6% in the 60-year-old group, 40- <60 years, 20- <40 years and <20 years. In the study of Ranganath et al., 2013, it can be seen that the increase in age (in all age groups) is significantly associated with a higher comorbidities (p ≤ 0.001). The average number of comorbidities in the elder people was almost twice as high as in the younger group (mean 6.8 and 3.8, p <0.001). The duration of the disease was longer than in the age group> 65 years <45 years (mean 14.1 and 5.6 years, P <0.001). In our study, the increase in co-morbidities was associated with an increase in BMI, and the highest incidence was observed in patients with BMI> 3013. Similarly, Ajeganova S et al concluded that obesity and central obesity are associated with a higher incidence of comorbidities, both at the beginning of the disease and during its duration. In addition, BMI and obesity independently increased the likelihood of diagnosing hypertension, DM and chronic lung disease. In our study, RA, SpA, OA and SLE were the most commonly RDs and therefore were evaluated in more detail in the study of comorbidities.

Hypertension was the most common comorbid condition in RA patients, followed by hypothyroidism, DM, ILD and asthma. In a similar study looking at comorbidities in RA patients in a hospital in Bangladesh, most RA patients had anaemia (66.67%) followed by infection (13.73%) and thyroid disease (13.7%). 9.80%), kidney disease (7.84%), osteoporosis (5.88%), CVD (5.88%), lung disease (5.88%) and vasculitis (1.96%). Hypertension (19.61%) followed by DM (9.80%) and dyslipidemia (7.84%) were commonly reported risk factors. Metabolic syndrome was found in 39.28% of RA patients; Pandey et al., 2017, observed that the incidence of hypertension was higher in the RA group than in the control group (41.66% vs. 25%). In our study, patients with SpA

showed the following comorbidities: DM, hypothyroidism, hypertension and tuberculosis were the most common. In a study in Pakistan, 16.3% of patients with SpA had uveitis. In Pakistan there is a lack of data on comorbidities in patients with SpA. In the recent ESPOIR and DESIR cohorts, 20.3% of patients with SpA had at least one comorbid disease; the utmost usual concomitant diseases were dyslipidemia (9.3%), ulcers (4%) and hypertension (5.1%).[14] In our study, OA patients showed the following comorbidities: hypertension, DM, hypothyroidism, and chronic kidney disease (CKD). In a study by Sancheti et al., 2017, in three hospitals in India, similar results were observed.

In our study, SLE patients had hypertension, DM, CKD, hypothyroidism, chronic lymphocytic and leukaemia. Similarly, in other studies, the utmost usual comorbidity was hypertension in these patients. In South Africa, the most common comorbidities in patients with SLE were hypertension (43.5%), severe infections (29%), tuberculosis (15%) and HIV infection (9%).[15] The utmost usual comorbidities are osteoporosis/ osteopenia (22.2%), high blood pressure (33.7%), DM (11.6%), hypercholesterolemia (11.6%) and hypothyroidism (19.0%). Basically, high blood pressure, DM, hypercholesterolemia and CAD are more common in patients with SLE older than 54-year-old said by Puerto Rico.

CONCLUSION

In our study, RDs patients had significant comorbidities. This study also showed that RD and comorbidities increased significantly with age and BMI. Comorbidities should be identified and included in the management of DR. Early detection of related comorbidities is useful for successfully treating rare diseases.

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