



Original Article

Urological comorbidities in Egyptian rheumatoid arthritis patients: Risk factors and relation to disease activity and functional status

Marwa Niazy^{a,*}, Wafaa Gaber^a, Abdelkawy Moghazy^a, Hosni Khairy Salem^b^a Rheumatology Department, Faculty of Medicine, Cairo University, Egypt^b Urology Department, Faculty of Medicine, Cairo University, Egypt

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ABSTRACT

Aim of the work: To assess the urological disorders in rheumatoid arthritis (RA) patients, analyse the risk factors and to find their relation to disease activity and functional status.**Patients and methods:** 291 RA patients (253 females and 38 males; F:M 6.7:1) and 242 matched controls were included. Urological disorders in the form of urinary tract infections (UTI), urolithiasis and acute urine retention (AUR) were assessed, risk factors were analysed. Disease activity score (DAS-28) and modified health assessment questionnaire (mHAQ) were calculated.**Results:** RA patients had more frequent urological disorders (38.14%) than controls (20.66%), more UTI ($p < 0.001$) and this difference persisted in females ($p < 0.001$). Urolithiasis tended to be more frequent in RA patients ($p = 0.3$); the difference was significant between the female patients and controls ($p = 0.04$). Urinary stones were comparable between the male patients and controls ($p = 0.2$). RA patients had more AUR (4.8%) than the controls (2.1%) ($p = 0.07$). Asthmatic patients particularly the females had more UTI ($p = 0.001$ and $p < 0.001$ respectively). UTIs were observed with higher steroid doses ($p = 0.04$) and urolithiasis were noticed more in hypertensive female patients ($p = 0.03$). Patients with higher DAS-28 and mHAQ developed more urological comorbidities ($p = 0.49$ and $p = 0.82$ respectively). UTI and urolithiasis were detected in patients with higher DAS 28 ($p = 0.1$ and $p = 0.4$ respectively).**Conclusion:** RA patients were found to have more urological disorders. Bronchial asthma, hypertension and higher steroid doses may increase risk for urinary comorbidities in RA. Patients with higher DAS28 and mHAQ had more urological comorbidities, however without statistically significant difference.© 2017 Egyptian Society of Rheumatic Diseases. Publishing services provided by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Rheumatoid Arthritis (RA) is the commonest form of chronic inflammatory arthritis [1]. It has a prevalence of slightly less than 1% in adults [2]. It is a multi-factorial disease sustained by environmental and genetic factors [3,4]. RA primarily targets synovial joints with protean clinical features. RA not only affects health related quality of life, but it also increases mortality [5,6]. It is believed that adherence to treatment is crucial to successful therapy [7,8]. Safety issues regarding therapy are important for the patient to attain a state of maximum possible well-being [9].

A high frequency of infections complicating RA has been previously reported [10] and even in the pre-steroid era, RA patients had

an increased susceptibility to infection [11]. At least part of the increased mortality appears to be due to infection, in particular, genitourinary and bronchopulmonary [12–16]. Morbidity from sepsis is also common, and a prevalence as high as 45% over 10 years has been recorded [17,18]. Risk factors included the presence of extra-articular manifestations and prior use of oral steroids [19,20]. The presence of RA has a co-additive effect on the formation of urolithiasis when calcium metabolism changes mostly iatrogenic induced [21,22]. Some epidemiological studies showed that arthritis and inflammatory musculoskeletal diseases are associated with the increased risk of increased residual urine and acute urine retention (AUR) [22,23].

Urological disorders are among the significant comorbidities in RA patients. More studies need to be conducted to detect their presence, risk factors and relation to disease activity. The aim of our study was to assess the frequency of urological disorders in Egyptian RA patients, to analyze the risk factors and to find their relation to the disease activity and functional status.

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* Corresponding author.

E-mail addresses: marwahassan26@hotmail.com, marwa.niazy@kasralainy.edu.eg (M. Niazy).<http://dx.doi.org/10.1016/j.ejr.2017.04.006>1110-1164/© 2017 Egyptian Society of Rheumatic Diseases. Publishing services provided by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

2. Patients and methods

This cross-sectional observational study was conducted from November 2014 till end of 2015). The study was approved by the local ethics committee and the patients provided an informed consent prior to inclusion in the study. 291 RA patients (253 females and 38 males) were recruited from the Rheumatology outpatient clinic, Cairo University Hospitals. In addition 242 healthy subjects of matched age and sex (197 females and 45 males) served as the control; they were recruited from nursing staff and workers.

Rheumatoid arthritis was diagnosed according to the 2010 American College of Rheumatology/The European League against Rheumatism (ACR/EULAR RA) Classification Criteria [24]. Disease activity score (DAS-28) [25] and modified health assessment questionnaire (mHAQ) [26] were calculated for each patient.

Systemic work up involved routine laboratory investigations including complete blood count (CBC), erythrocyte sedimentation rate (ESR), rheumatoid factor (RF) and anti-cyclic citrullinated peptide (anti-CCP) antibodies. All patients were regularly receiving one or more of the disease modifying anti-rheumatic drugs (DMARDs) with or without corticosteroids. For all subjects; complete urologic history, examination and investigations either laboratory in the form of urinalysis or radiological in the form of abdominopelvic US were performed when needed.

2.1. Statistical analysis

Data were collected, tabulated and analyzed by SPSS package version 15 (SPSS corporation USA), qualitative data were presented in the form of number and percent and quantitative data were presented in the form of mean \pm standard deviation. Statistical differences between groups were tested using the Chi-square test for qualitative variables, independent sample *t*-test for quantitative variables. Stepwise logistic regression analysis was performed; *P*-values < 0.05 were considered statistically significant.

3. Results

The 291 RA patients had a F:M (253/38; 6.7:1). The mean age of the patients was 45.9 \pm 12.7 years and disease duration was 8.7 \pm 7.7 years. The control had a comparable age (44.3 \pm 11.9 years) and gender distribution (197/45; 4.4:1). There was no significant difference in the baseline characteristics between RA patients and control (Table 1). Urological comorbidities were found in 111/291 (38.14%) RA patients in comparison to (20.66%) controls. Comparison of basic characteristics, clinical

Table 1
Baseline characteristics and urological comorbidities in rheumatoid arthritis patients and control.

Parameter mean \pm SD or n(%)	RA Patients (n = 291)	Controls (n = 242)	P
Age (years)	45.9 \pm 12.7	44.3 \pm 11.9	0.1
BMI	29.1 \pm 6.2	29.4 \pm 5.2	0.5
Gender			
Male	38(13.1)	45(18.6)	0.05
Female	253(86.9)	197(81.4)	
Smoking	27(9.3)	17(7)	0.2
Educated	157(54)	140(57.9)	0.2
Married	216(74.2)	187(77.3)	0.2
Diabetes milletes	24(8.2)	28(11.6)	0.1
Hypertension	51(17.5)	40(16.5)	0.4
Dyslipidemia	41(14.1)	24(9.9)	0.09

SD: Standard deviation. BMI: body mass index, UTI: urinary tract infection, AUR: acute urinary retention. Bold values are significant at *p* < 0.05.

features, diseases activity and functional status in RA patients with and without urological disorders is shown in Table 2.

Urinary tract infections were significantly increased in RA patients (n = 88/291;30.2%) as compared to controls (n = 39/242;16.1%)(*p* < 0.001). Urolithiasis was detected in 43 (14.8%) patients and in 29 (11.98%) controls (*p* = 0.3). Acute urine retention was detected in 14 (4.8%) of RA in comparison to (2.1%) of the control (*p* = 0.07). Urinary tract infection and stones were significantly more frequent in female patients compared to female controls (n = 72;28.5% vs n = 26;13.2% and n = 37;14.6% vs n = 17;8.6%)(*p* < 0.001 and *p* = 0.04, respectively). Also, AUR tended to be more frequent (*p* = 0.05) (Table 3).

Multivariate regression analysis revealed that asthmatic RA patients particularly the asthmatic females had higher UTI (61.9% and 58.1%) versus non- asthmatics (38.1% and 24.3%) (*p* = 0.001 and *p* < 0.001 respectively). Urological comorbidities and UTIs were observed more in patients who consumed higher steroid doses (4.6 \pm 4.2 mg/d) (*p* = 0.043 and *p* = 0.04, respectively). Hypertensive female patients had higher frequency of urolithiasis (25%) than non-hypertensives (12.4%) (*p* = 0.03) Nothing was significant as regards multivariate analysis concerning urological comorbidities in male RA and controls.

Patients with high DAS28 score had more UTI and urolithiasis than those with low and moderate disease activity (*p* = 0.1 and *p* = 0.4 respectively) (Table 4).

4. Discussion

In the present study, urological comorbidities were more frequent in RA patients. Urinary tract infections (UTI) were found to significantly affect more RA patients than control. This significance persisted in female patients compared to controls. In agreement, Puntis and colleagues [20] demonstrated a higher incidence of hospitalization for UTI among RA patients than would be expected for the general population and most of the patients were elderly females. The higher incidence of UTI also supports previous publi-

Table 2
Comparison of basic characteristics, clinical features, disease activity and functional status in rheumatoid arthritis patients with and without urological disorders.

Parameter mean \pm SD or n (%)	RA Patients with urological disorders (n = 111)	RA patients without urological disorders (n = 180)	P
Age (years)	46.9 \pm 12.3	45.4 \pm 12.9	0.317
Disease duration (years)	9.6 \pm 8.8	8.1 \pm 6.9	0.106
BMI	29.2 \pm 5.9	29.0 \pm 6.3	0.83
Gender			
Male	19(6.5)	19(6.5)	0.107
Female	92(31.6)	161(55.3)	
MS	31.6 \pm 40.8	31 \pm 37.5	0.899
ESR	37.2 \pm 18.2	42.1 \pm 24.2	0.065
DAS 28	4.1 \pm 1.2	4.0 \pm 1.3	0.49
MHAQ	0.8 \pm 0.7	0.7 \pm 0.9	0.82
Medications used			
Steroids (mg/day)	4.3 \pm 4.5	3.1 \pm 4.8	0.043
MTX (mg/ week)	13.5 \pm 9.9	12.2 \pm 10.6	0.31
Leflunomide (mg/day)	6.3 \pm 9.3	7.6 \pm 9.7	0.26
HCQ (mg/day)	75.7 \pm 157.4	106.7 \pm 177.4	0.13
SAS (mg/day)	40.5 \pm 253.5	41.7 \pm 279	0.97

SD: Standard deviation, BMI: Body Mass Index, MS: morning stiffness, ESR: Erythrocyte Sedimentation Rate, DAS: Disease Activity Score, mHAQ: modified Health Assessment Questionnaire, Bold values are significant at *p* < 0.05.

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