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Comparison of sexual function in men with spondyloarthritis and rheumatoid arthritis

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ABSTRACT

Aim of the work: To evaluate sexual function in Tunisian men with spondyloarthritis (SpA) and rheumatoid arthritis (RA) compared to healthy controls. The association between erectile dysfunction (ED) and specific parameters of SpA and RA was also studied.
Patients and methods: The study included 37 SpA, 13 RA patients and 50 healthy age matched controls. Sexual function of patients and controls was evaluated by the International Index of Erectile Function-5. ED was considered if the score was <21. Pain during intercourse and sexual desire were also assessed.
Results: The mean age of the SpA and RA patients and control were comparable (42.5 ± 11.4 years, 49.6 ± 12.8 years and 48.8 ± 13.9 years). The prevalence of ED in rheumatic disease patients (SpA and RA) was 80% versus 70% in controls. A significant difference was found in the severity of the ED between patients and control ($p = 0.04$) and between SpA and RA patients ($p = 0.012$). There was also a higher prevalence of pain during intercourse ($p < 0.0001$), lower intensity of sexual desire ($p = 0.005$) and more dissatisfaction in relation with the partner ($p < 0.0001$) in the RD patients. ED in SpA and RA patients was significantly associated with higher age ($p = 0.001$), marital status ($p = 0.007$), higher age of disease's onset ($p = 0.027$), pain during intercourse ($p = 0.05$) and lower sexual desire ($p < 0.0001$). On regression analysis, only sexual desire was significantly associated with ED ($p = 0.03$).
Conclusion: This work suggests that patients with SpA or RA have a more severe ED in comparison with healthy control. However, specific disease parameters were not linked to ED.

1. Introduction

Sexual dysfunction (SD) is a widespread worldwide health problem especially in middle-aged and elderly people [1]. Based on epidemiological data from different geographical regions, the prevalence of SD ranged from 18.4% to 30% among men, and from 25.8% to 67% among women [2]. Male SD mainly includes diminished libido, abnormal ejaculation and erectile dysfunction (ED) which is defined as an inability to have or maintain erection sufficient for sexual intercourse for at least 6 months [3,4].

Spondyloarthritis (SpA) and rheumatoid arthritis (RA) are chronic rheumatic diseases (RD) that can lead to serious functional impairment, deprivation of daily activities, fatigue, emotional disturbances, and problems with body image and self-esteem. The result may lead to a less enjoyable sexual life [5,6]. Psoriatic arthritis (PsA) impacts patients' perception of sexuality and intimate relationships in both men and women, and is associated with sexual dysfunctions [7]. Sexual function in ankylosing spondylitis (AS) patients is associated with the pain, fatigue, disease activity, functional status, quality of life (QoL), depression as well as the cumulative exposure to smoking, and sexual dysfunction is related to the increasing degree of cigarette dependency [8]. Female axSpA patients, those with longer disease duration and higher disease activity presented a worse sexual life [9]. In fact inflammation in patients with axSpA even in the biologic treatment era reduces the sexual quality of life (SQoL) [10]. Moreover, Successful total hip arthroplasty may improve sexual activity in male ankylosing spondylitis (AS) patients with hip involvement [11]. In spite of

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the decreased sexuality in AS and PsA patients, there was no impact on fertility. However, a tendency to a decreased ability to conceive was present in RA patients, perhaps due to sexual problems [12]. Sexual disorders are present in a third of patients with RA and among the factors associated were the disease activity, presence of mood or psychiatric disorders, alcoholism, and concomitant autoimmune pathologies [13].

While the physical problems of these RD are the main issues of treatment, sexual problem is often ignored and still a controversial issue due to limited number of studies and opposite results. In the Arabic and Islamic culture, discussion about sexuality may be perceived as a taboo subject, which may explain the lack of studies in this area.

The aim of this study was to evaluate sexual function in Tunisian men with SpA and RA and to compare it with healthy controls. The association between ED and specific parameters of SpA and RA was also well thought-out.

2. Patients and methods

This is a cross sectional case control study, including 50 men with a RD in the form of SpA fulfilling Assessment of Spondyloarthritis Society (ASAS) criteria [14] or RA fulfilling American College of Rheumatology/European League Against Rheumatism 2010 classification criteria [15]. The controls included 50 healthy men volunteers age-matched recruited from the accompaniment of patients. Subjects were eligible for this study if they were married and/or sexually active. Patients were excluded if they had anatomical defects of penis, were on drugs that can cause erectile problem, had any neurological involvement like caudal equine syndrome, vascular disease (hypertension, heart disease, hyperlipidemia) or psychological disorders. All subjects provided an informed consent for contribution in the work. The study was approved by the ethical committee of Mongi Slim Hospital in accordance to the national guidelines (number 20/19).

Age, marital status, comorbidities (diabetes) and habits (smoking) were documented for all subjects. For SpA and RA patients, disease duration, age of disease's onset and the presence of coxitis were reported. The erythrocyte sedimentation rate (ESR) (mm) and C-reactive protein (CRP) (mg/l) were assessed. The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) [16], Ankylosing Spondylitis Disease Activity Score (ASDAS) [17] SpA patient and the disease activity score (DAS28) [18] was assessed in RA patients. Functional disability was evaluated in SpA patients by the Bath Ankylosing Spondylitis Functional (BASFI) [19]. Patients' treatments were noted including non-steroidal anti-inflammatory drug (NSAIDs), conventional synthetic disease modifying antirheumatic drugs (csDMARDs) or biologic DMARDs (bDMARDs).

2.1. Assessment of sexual function

The evaluation of the sexual function of patients and controls was based on the international index of erectile function-5 (IIEF-5) [20]. It is a self-reported questionnaire assessing erectile function for the last six months. The global score is obtained by adding the scores of five questions. It ranges from 5 to 25. ED is considered if the score was < 21 and was classified as mild (16–20), moderate (11–15) or severe (<11). Patients were divided into a group with normal erectile function and another group with mild to severe ED. The pain during intercourse was assessed with the visual analog scale (VAS) pain. The sexual desire (intensity and frequency) assessment was obtained by adding the scores of two questions from the IIEF-15. It ranges from 2 to 10. The self-perception of sexual function of patients was assessed by asking the following yes/no question: "Are you satisfied with the relation with your partner?".

2.2. Statistical analysis

Data were analyzed using SPSS software package version 11.5. Data were reported as means with standard deviations (SD), or as medians with interquartile ranges (IQR), if appropriate. The correlation between two quantitative variables was performed using the Pearson test and between two qualitative variables using the Chi^2 test. The Student's T and the Mann and Whitney tests were considered according to the distribution of the variables. Logistic regression was used to determine factors independently associated with SD. Results were presented as odds ratios (OR) with 95% confidence interval (CI). The significance level was set at $p < 0.05$.

3. Results

The characteristics of patients with RD, SpA and RA as well as control are presented in Table 1. No significant differences between groups were found. In SpA patients, mean disease duration was 11.4 ± 7.1 years. Mean BASDAI, ASDAS and BAFSI were respectively 2.57 ± 2.5, 2.36 ± 1.05 and 2.59 ± 2.5. 90% of patients were on NSAIDs or csDMARDs and 56.7% were on bDMARDs. In RA patients, mean disease duration was 7.1 ± 6.2 years and the age of disease's onset was 42.9 ± 16.3 years. The mean DAS28 was 2.28 ± 1.2. 84% of patients were on csDMARDs and 23% on bDMARDs. The comparison of SpA and RA showed no significant difference for inflammation parameters: CRP ($p = 0.59$) and ESR ($p = 0.06$). However, the presence of coxitis was significantly higher for patients with SpA ($p = 0.01$). No patient had refused to reply to the questionnaire.

The prevalence of ED in RD patients was 80% vs 70% in controls ($p = 0.2$). A significant difference was found in the severity of the ED between SpA and RA ($p = 0.04$). There was also higher prevalence of pain during intercourse, lower intensity of sexual desire and more dissatisfaction in relation with partner in patients. The frequency of ED, pain during intercourse and sexual desire were comparable between SpA and RA patients. ED was more severe in RA patients (Table 2).

The comparison of patients with normal erectile function and those with mild to severe ED in the RD patients is illustrated in Table 3.

On regression analysis, only sexual desire was independently associated with ED in RD patients (Table 4).

4. Discussion

The present work endorses the finding that the prevalence of ED in RD patients is comparable to the general population. However, RD patients had worse erectile function, more pain during intercourse, lower intensity of sexual desire and more dissatisfaction in relation with the partner. Despite the fact that Tunisia has a reserved culture, this study is the first to evaluate male sexual function in two different RDs (SpA and RA). Few studies with limited numbers of patients studied the sexual function in SpA or RA male patients and some of them reported SD [21–26]. *Dincer et al.* demonstrated that the incidence rate of SD, using the Brief Male Sexual Function Inventory (BMSFI), was higher in patients with AS when compared with the healthy people [21]. *Santana et al.* also reported a high prevalence of ED among AS patients [24]. *Sariyildiz et al.*, in a study on 70 male AS, reported that all five domains of IIEF were affected [26]. In a case-control study examining the association of ED with a prior diagnosis of AS in Taiwan, *Chung et al.* revealed that ED patients had 1.58-fold higher odds of prior AS diagnosis [27]. Sexual dysfunction is a little-addressed condition

Table 1
Characteristics of patients with rheumatic disease: spondyloarthritis (SpA) and rheumatoid arthritis (RA) and controls.

Parameters n(%) or mean ± SD	SpA (n = 37)	RA (n = 13)	p	RD (n = 50)	Controls (n = 50)	p
Age (years)	42.5 ± 11.4	49.6 ± 12.8	0.06	44.3 ± 12.1	48.8 ± 13.9	0.11
Diabetes	3 (8)	1 (17)	0.96	4 (8)	14 (28)	0.09
Smoking	15 (40.5)	5 (38.4)	0.58	20 (40)	29 (58)	0.71
Married	37 (100)	10 (76.9)	0.33	33 (66)	39 (78)	0.18

RD: rheumatic disease, SpA: spondyloarthritis, RA: rheumatoid arthritis.

Table 2
Comparison of the sexual function in patients with rheumatic diseases (spondyloarthritis or rheumatoid arthritis) and controls.

Parameters n(%) or median (IQR)	SpA (n = 37)	RA (n = 13)	p	RD (n = 50)	Controls (n = 50)	p
Erectile function						
Normal	7 (19)	3 (23)	0.74	10 (20)	15 (30)	0.2
ED	30 (81)	10 (77)		40 (80)	35 (70)	
ED severity						
Mild	17 (46)	3 (23)	**0.012**	20 (40)	26 (52)	**0.04**
Moderate	9 (24.3)	1 (7.6)		10 (20)	7 (14)	
Severe	4 (10.7)	6 (46)		10 (20)	2 (4)	
Pain during intercourse	3 (1-5)	3 (2-5)	0.51	3 (1-5)	0 (0-1)	**<0.0001**
Sexual desire	6.5 (5-8)	7 (5-8.5)	0.26	6.5 (5-8)	0 (0-0)	**0.005**
Satisfaction with partner	8 (21.6)	2 (15.3)	0.48	10 (20)	19 (38)	**<0.0001**

RD: rheumatic disease, SPA: spondyloarthritis; RA: rheumatoid arthritis, BASFI: Bath Ankylosing Spondylitis Functional Index; BASDAI: Bath Ankylosing Spondylitis Disease; ED: erectile dysfunction; IQR: interquartile range. Sexual desire is a measure of intensity and frequency. IQR: Interquartile range Bold values are significant at p < 0.05.

Table 3
Parameters linked to erectile dysfunction in male with rheumatic diseases.

Parameters	Normal (n = 10)	ED (n = 40)	p
Age (years)	32.6 ± 7.9	47.3 ± 32	**0.001**
Diabetes	0 (0)	4 (10)	0.29
Smoking	4 (40)	16 (40)	0.79
Married	3 (30)	30 (75)	**0.007**
Age at onset (years)	25.9 ± 10	36.9 ± 13.6	**0.027**
Disease duration (years)	7.4 ± 7	11.1 ± 6.8	0.11
SpA disease activity (n = 37)	(n = 7)	(n = 30)	
* BASDAI	2.8 ± 2.2	2.5 ± 1.9	0.9
* ASDAS	2.6 ± 1.4	2.2 ± 0.9	0.87
RA disease activity (n = 13)	(n = 3)	(n = 10)	
* DAS28	1.9 ± 0.5	3.01 ± 1.07	0.44
CRP (mg/l)	20.6 (5–18.7)	18.5 (3.7–30.2)	0.76
ESR (mm)	25.1 ± 21.3	30.7 ± 23.1	0.32
BASFI for SPA (n = 37)	2.8 ± 3.7	2.5 ± 2.2	0.47
Coxitis	3 (30)	16 (40)	0.56
NSAIDs	4 (40)	12 (30)	0.57
csDMARDs	5 (50)	21 (52.5)	0.82
Biologic DMARDs	6 (60)	18 (45)	0.43
Pain during intercourse	2 (1–3.25)	3.3 (2.25–6)	**0.05**
Sexual desire	8.3 ± 0.6	5.9 ± 1.6	**<0.0001**

Results are presented as n(%), mean ± SD or median (IQR). SpA: spondyloarthritis; RA: rheumatoid arthritis; BASFI: Bath Ankylosing Spondylitis Functional Index; BASDAI: Bath Ankylosing Spondylitis Disease; ASDAS: Ankylosing Spondylitis Disease Activity Score, NSAIDs; non-steroidalanti-inflammatory drug; DMARD: disease modifying anti rheumatic drug, ESR: erythrocyte sedimentation rate, CRP: C-reactive protein, DAS28: disease activity score in 28 joints; IQR: Interquartile range. Bold values are significant at p < 0.05.

Table 4
Regression analysis for parameters linked to erectile dysfunction in male with rheumatic diseases.

Variable	OR (CI)	*p*
Age	1.1 (0.66–1.88)	0.68
Marital status	0.17 (0.004–7.41)	0.36
Disease duration	1.13 (0.68–1.86)	0.62
Age at onset	1.04 (0.63–1.72)	0.86
Sexual desire	0.13 (0.02–0.82)	**0.03**
Pain during intercourse	2.2 (0.82–6.08)	0.11

OR: odd ratio, CI: confidence interval. Bold values are significant at p < 0.05.

in patients with RA and involves common symptoms such as physical problems, impaired marital emotions and relationships, pain, fatigue, functional weakness, anxiety, negative self-image, reduced sexual desire, hormonal imbalance, and medicinal side effects [28]. *Van Berlo et al.* found that adult males with RA felt less sexual desire than controls [29]. Clinically relevant abnormalities in reproductive hormones were mainly identified in patients with RA and a significant relation with disease activity was reported [30]. There is a relationship between RA and SD [28]. Furthermore, semen quality (including sperm count and motility) in men with RDs can be impaired in patients with SLE, SpA, sarcoidosis and Behcets disease. No negative effect of paternal RA on pregnancy outcomes was reported [30]. However, other studies did not find SD in patients with RD [31–34]. *Rezvani et al.* showed no significant differences between SpA patients and healthy male controls in terms of sexual function evaluated by the IIEF [34]. Egyptian male RA patients SD assessed by IIEF was not significantly higher than control [35]. *Bal et al.* used IIEF to assess ED among AS males and failed to detect a difference in the frequency of ED compared to control [4]. Moreover, in a study on AS patients, *Guenther et al.* reported no differences concerning sexual problems [31].

Impaired sexual health is reported in men with RDs and the degree and extent of impairment vary per disease [30]. The differences between studies can be attributed to the diversity of populations studied in terms of their sexual behavior, socio-cultural differences and size [32]. Moreover, different validated questionnaires have been used in literature for male sexual function assessment, such as IIEF [26], Brief Male Sexual Function Inventory (BMSFI) [21] and Glombok–Rust Sexual Satisfaction Scale and 4th edition (DSM-IV) [33]. In this study, sexual function was evaluated with IIEF-5 form. More research is needed to fully understand the link. Meanwhile, rheumatologists should be aware of this association and discuss it with their patients [30].

Sexual dysfunction can be due to an interaction of organic and psychogenic problems [34]. Age, chronic diseases such as diabetes, neurologic disease, chronic renal failure, cardiologic problems, peripheral vascular diseases, hyperlipidemia and smoking are considered as risk factors for ED [4]. However, in RD like SpA and RA,

SD can also be associated to inflammation causing atherosclerosis, to pain, deformity, depression, social life, body image disturbances, fatigue, physical inactivity and discomfort during sexual intercourse [5,6]. *Kraaimaat et al.* found that physical disability, pain, and depression contribute to intrusiveness of RA on sexuality in male patients [36,37].

In this study, ED was significantly related to sexual desire but not to specific disease parameters as functional impairment, disease activity, treatment or hip deformity. This coincides with *Rezvani et al.* who found no significant correlation between any domain of the IIEF and the AS indices or laboratory parameters [34]. They have associated male sexual issues in SpA patients with an unfavorable psychological status [34]. *Bal et al.* found that duration of morning stiffness and BASDAI was negatively correlated with sexual desire and overall satisfaction. However, they have no negative impact on erectile function, orgasmic function and intercourse satisfaction domains of IIEF [4]. *Dhakad et al.* showed that ED was associated with higher patient age, longer disease duration and higher BASFI in SpA patients [22]. With regard to frequency of and experienced distress with sexual problems, men who used medication with a known effect on ejaculation (e.g., methotrexate, naproxen) experienced indeed more distress with orgasm than men who did not use this medication [29]. More importantly, no comparative studies between SpA and RA about sexual function were found in the literature. In the current work, there was no significant difference between both diseases concerning the frequency of ED, pain during intercourse and sexual desire. However, ED was more severe in RA.

It should be noted that this study has some limitations. It was from a single centre, so results cannot be generalized to the rest of the population. Moreover, as it is a cross sectional study, it is difficult to relate a unique estimation of the disease activity with a long lasting process of sexual dysfunction. Furthermore, smoker and diabetics were not excluded. However, both RDs and control were comparable concerning diabetes and smoking. Also, these parameters were not significantly associated with ED. In addition, a psychological evaluation of patients and a vascular exploration using ultrasonography to search for atherosclerosis were not performed. Finally, current patients were on medications (csDMARDs, bDMARDs and/or NSAIDs), so their potential effect in sexual function cannot be definitely excluded. However, these drugs were not significantly linked to ED. In the literature, few case reports of reduced libido and erectile dysfunction due to methotrexate were reported [38].

In conclusion, this study shows that sexual function is a substantial problem in SpA and RA male patients. This involves erectile function, pain during intercourse and sexual desire. Moreover, ED seems to be more severe in RA than in SpA patients and it is independently associated with pain during intercourse and lack of sexual desire. Hence, health providers must consider sexual function as a part of their QoL and should guide them by providing information as part of a therapeutic patient education and refer them to specialists when appropriate. Future longitudinal studies are needed to observe the effect of RD on sexual life.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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