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REVIEW ARTICLE

The impact of rheumatic diseases on sexual function

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Abstract Sexuality is a complex aspect of the human being's life and is more than of only the sexual act. Normal sexual functioning consists of sexual activity with transition through the phases from arousal to relaxation with no problems, and with a feeling of pleasure, fulfillment and satisfaction. Rheumatic diseases may affect all aspects of life including sexual functioning. The reasons for disturbing sexual functioning are multifactorial and comprise disease-related factors as well as therapy. In rheumatoid arthritis and ankylosing spondylitis patients, pain and depression could be the principal factors contributing to sexual dysfunction. On the other hand, in women with Sjögren's syndrome, systemic lupus erythematosus and systemic sclerosis sexual dysfunction is apparently most associated to vaginal discomfort or pain during intercourse. Finally, sexual dysfunction in patients with fibromyalgia could be principally associated with depression, but the characteristic symptoms of fibromyalgia (generalized pain, stiffness, fatigue and poor sleep) may contribute to the occurrence of sexual dysfunction. The treatment of sexual dysfunction will depend on the specific patient's symptoms, however, there are some general recommendations including: exploring different positions, using analgesics drug, heat and muscle relaxants before sexual activity and exploring alternative methods of sexual expression. This is a systemic review about the impact of several rheumatic diseases on sexual functioning. There are no previous overviews about this topic so far.

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Introduction

Sexuality has been described as an integral part of the human being, and is associated to the quality of life. Sexuality is a complex aspect of the human being's life and is more that of only the sexual act [1]. Normal sexual functioning consists of sexual activity with transition through the phases from arousal to relaxation with no problems, and with a feeling of pleasure, fulfillment and satisfaction [1, 2]. Sexuality and its expression are important for healthy and ill individuals and therefore, a crucial part of an individual's self-identity [3].

Rheumatic diseases may affect all aspects of life including sexual functioning. The reasons for disturbing sexual functioning are multifactorial and comprise disease-related factors as well as therapy. These factors include: pain, fatigue, stiffness, functional impairment, depression, anxiety, negative body image, reduced libido, hormonal imbalance, and drug treatment [4]. Physical problems, emotional problems and partnership difficulties arising from disease-related stress contribute to a less active and often less enjoyable sex life. Chronic pain, fatigue and low self-esteem can reduce an individual's sexual interest and thereby reduce the frequency of intercourse. The pleasure of intercourse can become diminished by pain of joint movement, or difficulty in finding positions that do not cause discomfort [4]. Furthermore, specific sexual dysfunction can be caused by several rheumatic diseases, and are related to the nature of prevailing symptoms. Sexual problems created by both the physical changes of the illness and its attendant emotional distresses not only affect people

with rheumatic diseases, but also their partners. There may be gender differences in the impact of rheumatic diseases on sexual satisfaction.

Another important issue is the impact of rheumatic diseases in adolescence. Adolescence is a time of change biologically, emotionally and socially. Body image is important to all adolescents, and may be detrimentally affected by rheumatic diseases such as juvenile idiopathic arthritis (JIA) [5, 6]. Relationships with sexual partners may take longer to establish, possibly because the relationship is not just partner-to-partner but also potentially care-to-dependant [7].

Sexual functioning is a neglected area of quality of life in patients with rheumatic diseases that is not routinely addressed by physicians or health professionals. Sexual functioning is also not a part of questionnaires frequently used to assess physical function or quality of life. In a recent survey of ten rheumatologists, only 12% of patients seen in their practice were screened for sexual activity. The reasons given by rheumatologists were time constraints, discomfort with the subject, and ambivalence whether such a screening is in their domain or not [8].

It is therefore important that physicians or any other health professionals in charge of handling these kinds of patients raise the subject of sexuality and discuss it with them [9, 10]. Because the impact of chronic inflammatory disease on sexual function varies from one disease to another [11], and because there are no previous overviews about the impact of several rheumatic diseases on sexual function, this systematic review is intended to cover this important but underestimated problem.

Rheumatoid arthritis

Rheumatoid arthritis (RA) is a chronic inflammatory autoimmune disease characterized by progressive joint destruction resulting from chronic synovial inflammation. It leads to various degrees of disability, and ultimately has a profound impact on the social, economic, psychological, and sexual aspects of the patient's life [12]. The percentage of patients with RA who experience sexual problems ranged in various studies from 31 to 76% [13–19].

The two main fields of sexual problems experienced in RA patients are: difficulties in performing sexual intercourse (sexual disability) and diminished sexual drive reflected in both diminished desire and satisfaction. Difficulty in assuming certain positions when hip or knee mobility is limited, dyspareunia due to vaginal dryness in secondary Sjögren's syndrome, and joint pain and fatigue during the intercourse are the principal manifestations of sexual disability, with the latter experienced by 50–61% of RA patients [20–22]. Hill et al. [23] found that 56% of RA patients reported that arthritis placed limitations on sexual intercourse mainly due to fatigue and pain. It has been shown that when the hip joint is severely affected, total hip replacement can improve sexual disability to pre-disease levels in 50% of sexually active patients with RA [24]. On the other hand, diminished sexual drive is manifested by a decrease in desire in 50–60% of RA patients, reduced frequency of intercourse in up to 73% of patients, increase in aversion to sexual interactions, and diminished sexual satisfaction over time compared to pre-disease levels [4, 11, 20–22].

Østensen et al. [25] in a study of patients with history of juvenile chronic arthritis (JCA) showed that in the younger age group and patients with inactive or less active disease, sexual activity and frequency of intercourse was not different from healthy, age-matched controls. Female patients who shared characteristics of marital status with their healthy counterparts showed a similar attitude to sexual activity. In contrast, Packham et al. [26] found that in a study of 246 adult patients with long-standing JCA, 50% had a detrimental effect on body image but only 28.2% of the patients experienced problems with their relationships. A total of 58.3% patients who were sexually active had disease-related sexual problems.

On the other hand, it is recognized that the androgenic status could be related with sexual function. However, hypogonadism or testicular dysfunctions do not necessarily reduce sexual activity. Gordon et al. [17] showed that RA can cause hypogonadism with sexual dysfunction such as impotence and decreased libido. Other studies attributed sexual problems in RA to psychological variables such as depression, altered body image, and worries about partner interest [12, 14, 21, 27–29].

Kraaimaat et al. [19] found that physical disability, pain, and depression all contribute to the intrusiveness of RA on sexuality. Gutweniger et al. [30] found that morning stiffness in female RA patients plays an important role in their feelings of being a handicap. Female RA patients with a high degree of morning stiffness had significantly more worries about body image and experienced more sexual dissatisfaction than females with lower degrees of morning stiffness.

Recently, Abdel-Nasser et al. [31] studied 52 female patients with RA. They found that more than 60% of female RA patients experienced variable degrees of sexual disability and diminished sexual desire and satisfaction. Difficulties in sexual performance were related to overall disability and hip involvement, while diminished desire and satisfaction were influenced more by perceived pain, age, and depression.

In another recent study, van Berlo et al. [32] found that male patients felt less sexual desire, and female patients masturbated and fantasized less than controls. Up to 41% of

the men, and up to 51% of the women had troubles with several joints during sexual activities. Medications influencing ejaculation in men (methotrexate, naprosyne) correlated with distress with orgasm.

Karlsson et al. [33] found that the patients with early RA (shortly after disease onset) are less satisfied with life as a whole compared with a reference group of patients with long-standing disease. Patients with early RA also reported low levels of satisfaction with self-care activities, work and sexual life, the women being more satisfied than men.

Finally, in a study by Majerovitz et al. [34], who examined the relationship between functional disability and sexual satisfaction for both rheumatic disease patients and their spouses and compared their levels of sexual satisfaction with those of healthy comparison couples, found that couples with and without rheumatic disease of one partner did not differ in sexual dissatisfaction. However, greater functional disability was related to greater sexual dissatisfaction for patients and spouses.

In summary, there are not enough studies comparing sexual functioning between RA patients and healthy controls. However, there is a tendency to find more sexual functioning problems in patients with RA. These patients could experience sexual disability and diminish sexual drive, with pain and depression being the most common symptoms.

Ankylosing spondylitis

Ankylosing spondylitis (AS) is a systemic chronic inflammatory disease affecting primarily the axial skeleton. Sacroiliitis is the most characteristic finding complicated by involvement of the entire vertebral column as well as pelvic and shoulder girdle joints. Pain (especially backaches), stiffness, and physical restrictions are the essential complaints in AS [35–41].

Sexuality in patients with AS has been little studied. There are only a few papers published about this issue. Like RA patients, they may be vulnerable to sexual problems created by both the physical changes of the illness and its attendant emotional distress. In an earlier study, Elst et al. [11] reported that AS patients did not score differently from the healthy population in regard to sexual motivation.

Recently, Pirildar et al. [42] showed that AS patients on an average have significantly lower erectile function, orgasmic function, intercourse satisfaction and overall satisfaction scores according to the International Index of Erectile Function compared to healthy controls, whereas sexual desire scores were not significantly lower. They were not able to relate any clinical features or laboratory findings to erectile dysfunction except the duration of morning stiffness.

In agreement with this study, Dincer et al. [43] found that the incidence rate of sexual dysfunction is higher in males with AS, when compared to healthy controls. Similarly as observed in RA patients, the sexual dysfunction in AS patients was associated with depression and limited joint mobility.

Similar to RA, Gordon et al. [17] showed that AS can cause hypogonadism with sexual dysfunction (impotence and decreased libido). At present, the importance of hypogonadism for sexuality has not been clarified yet. Ozgul et al. [44] studied 101 patients with AS, and investigated the impact of the disease on their social life. The level of anxiety was high and was associated with sexual relations.

In summary, the effect of AS on sexual functioning is controversial, some studies did not find differences between patients with AS and healthy controls. However, there are some studies that show that AS patients have sexual dysfunction such as erectile dysfunction and decreased libido. Like in RA patients, pain and depression could be the principal factors contributing to sexual dysfunction.

Sjögren's syndrome

Sjögren's syndrome (SS) is a slowly progressive autoimmune disease primarily affecting the exocrine glands and resulting in mucosal dryness associated with athrophic vaginitis and gingivitis [45]. The origin of SS remains unknown. However, genetic factors, hormonal factors, environmental factors, such as infections, have been proposed. The possible influence of androgens in primary SS has been studied in animal models [46–48]. The results indicate that androgen administration strongly suppresses the inflammatory reaction in the female mouse model of SS. Based of these results, the following question could come up: Is there any influence of the androgens on sexual function in patients with SS?

In this regard, Valtysdottir et al. [49] found a positive correlation between DHEA-S serum levels and the total McCoy score as well as the subscales of this score reflecting arousal, desire, and satisfaction [50]. Serum DHEA-S concentrations were also related to the total psychological general well-being (PGWB) score, and subscales of this score: depression, wellbeing, general health, and self control [51]. However, Hartkamp et al. [52] had found recently that patients from both the DHEA- and placebo-treated group improved on general fatigue, mental well-being, and depressive mood. They concluded that their study does not support a superior effect of DHEA over placebo in female patients with SS.

On the other hand, it has been shown that patients with SS have a high prevalence of painful intercourse due to dyspareunia [53], and kissing can be difficult and unpleasant

due to the dry mouth. In one study, dyspareunia was present in 61% of primary SS patients and 39% of women in the control group. Vaginal dryness was found in 52% of patients and 33% of controls [54].

In contrast, Skoupoli et al. [55] found that fertility, parity, and sexual activity in SS patients do not differ from that seen in healthy controls. Dyspareunia was observed in 40% of the patients during the premenopause period compared with 3% observed in controls. Half of the patients, however, had an obvious aetiology for dyspareunia (trauma or inflammation) not related to primary SS. It has been stated that any increase in vaginal dryness in women with SS beyond that associated with estrogen deficiency or vaginal infection may not only be related to an underlying autoimmune effect of SS on the vascular supply to the vagina, but also the stress of chronic illness tends to reduce vaginal moisture and this effect may be a concomitant cause. [54, 56].

In summary, in patients with SS sexual dysfunction is apparently most associated to dryness either vaginal or in the mouth, causing dyspareunia and difficulty to kiss.

Systemic lupus erythematosus

Systemic lupus erythematosus (SLE) is a multisystem, autoimmune, connective-tissue disorder with a broad range of clinical presentation. Disease manifestations range from fatigue, skin rash and arthralgias to central nervous system (CNS) involvement, nephritis, pneumonitis and cardiac disease [57]. SLE may affect all aspects of life including sexual functioning. However, the impact of SLE on sexual functioning has been less studied. Stein et al. [58] found that 4% of SLE patients experienced problems with sexual functioning, and 20% with self-image.

Curry et al. [59] found that when compared with controls, patients with SLE had a significantly higher rate of abstention, a lower frequency of sexual activity among the sexually active, diminished vaginal lubrication, poorer general sexual adjustment, and more depression. Greater vaginal discomfort or pain during intercourse and difficulty in penetration due to vaginal tightness were also found. However, sex drive, motivation, subjective arousal, orgasmic attainment, and satisfaction were not found to be worse when compared with controls. An increased prevalence of impotence in men with SLE has also been suggested [60].

Finally, SLE has been associated with substantial medical morbidity resulting in physical and occupational disability. However, the health status of patients with SLE may be improved by increasing patients' social support and satisfaction with health care, as well as controlling SLE disease activity and preventing organ damage [61, 62].

In summary, the impact of SLE on sexual functioning has been less studied. However, it has been found that women have lower frequency of sexual activity, probably due to the vaginal discomfort or pain during intercourse. In men, an increased prevalence of impotence has been found.

Systemic sclerosis

Systemic sclerosis (SSc) is a chronic autoimmune disease associated with abnormalities in the blood vessels and fibrosis often with vasculopathy of multiple organs such as skin, lungs, gastrointestinal tract, heart, and kidneys. It is characterized by alterations of the microvasculature, disturbances of the immune system, and by massive deposition of collagen [63, 64].

Erectile dysfunction (ED) is a common, but often underestimated, clinical feature in men with SSc. The prevalence of ED in SSc has been reported as ranging from 12 to 81% in different studies [65–67].

Although the pathogenesis is not clearly defined most of the literature support that ED associated with SSc is due to underlying vasculopathic and fibrotic changes (organic factors) and not phychogenic factors [68–71]. Several vascular, fibrotic, or neurogenic factors have been suggested in the pathogenesis of ED in SSc [68, 72, 73].

Some studies have reported that total testosterone and prolactin levels in blood are correlated with ED in men with SSc [68, 72]. However, others have not found this [65, 68–70, 72–74]. Hong et al. [67] postulate that ED may also be associated with other vascular phenomena, such as Raynaud's phenomenon (RP), independent of vascular disease. RP appears to be associated with ED in both SSc and RA, but is not necessarily an independent risk factor for ED in SSc alone.

In another study, Ostojic et al. [75] found that microvascular abnormalities are similar in patients with and without ED. Although patients with ED had higher depression indices, an unsatisfactory response to sildenafil citrate indicates that psychoneurogenic factors are not crucial in development of ED in SSc. In contrast, Proeitti et al. [76], showed that once-daily tadalafil improves both erectile function and vascular measures of cavernous arteries.

On the other hand, Bhadauria et al. [22] determined the involvement of the female genital tract and its functional consequences on menstrual and sexual aspects in SSc. They found that vaginal dryness, ulcerations and dyspareunia were much more common in SSc than in controls. More than half of systemic sclerosis patients reported a decrease in the number and intensity of orgasms, compared to <20% of control subjects. Skin tightness, reflux-heartburn, and muscle weakness adversely affected sexual relations more in systemic sclerosis than in control subjects.

Finally, Raynaud's phenomenon can affect the tongue and nipples, sclerosis of the fingers and digital ulcers may interfere with touch and foreplay. Intercourse can sometimes be severely impaired by vaginal tightness [22].

In summary, little is known about sexual function in patients with SSc, however, it has been reported that men frequently have ED. There are different theories about the pathogenesis of ED in patients with SSc including vascular, fibrotic and neurogenic theories. In women, vaginal dryness and tightness, and dyspareunia are the most frequently found symptoms of sexual dysfunction.

Fibromyalgia

Fibromyalgia is a very common disorder, with a prevalence of 2–4% of the population, and about 85–90% of the patients are women. In patients with fibromyalgia generalized pain, stiffness, fatigue, and poor sleep are the most common and characteristic symptoms. However, patients with fibromyalgia may also report a sensation of swelling in the soft tissues and paresthesias. Depression and mood disorders may also play an important role in the occurrence of fibromyalgia [77, 78].

People with fibromyalgia have a high prevalence of sexual dysfunction, however, only few studies about sexual function in patients with fibromyalgia have been reported [79]. Recently, Aydin et al. [79] found that according to the female sexual function index (FSFI) data, female sexual dysfunction was found in 26 out of 48 (54.2%) patients with fibromyalgia and only 6 out of 38 (15.8%) controls, a significant difference. The most common sexual problem was diminished desire in patients and controls. They concluded that depression is one of the emotional disorders

Table 1 Factors associated to sexual dysfunctions in rheumatic diseases and recommendations for specific symptoms

Disease	Sexual dysfunction	Factors implicated	Recommendations
RA	Sexual disability	Limited mobility	Change position
		Pain, fatigue	Analgesics, heat and muscle
		Morning stiffness	Relaxation before activity, surgery
	Dyspareunia	Vaginal dryness	Vaginal lubrication, estrogen cream
	Diminished desire and satisfaction	Anxiety, depression	Counseling, antidepresive drugs[a]
		Altered body image	
	Impotence	Hormonal imbalance	Sildenafil, sex therapy
AS	Erectile dysfunction	Morning stiffness	Sildenafil, sex therapy
		Limited joint mobility	Change position
		Hormonal imbalance	
	Diminished satisfaction and desire	Depression	Counseling, antidepresive drugs[a]
		Pain, fatigue	Analgesics
SS	Dyspareunia	Vaginal dryness	Vaginal lubrication, estrogen cream
SLE	Dyspareunia	Vaginal dryness	Vaginal lubrication, estrogen cream
		Vaginal tightness	
	Diminished desire	Depression	Counseling, antidepresive drugs[a]
		Altered body image	Counseling
	Impotence		
SSc	Erectile dysfunction	Vasculopathic and fibrotic changes	Sildenafil, sex therapy
		Depression	Counseling, antidepresive drugs[a]
	Dyspareunia	Vaginal dryness,	Vaginal lubrication, estrogen cream
		Ulcerations	
	Decrease orgasms	Skin tightness	Physiotherapy
		Reflux-heartburn	
		Muscle weakness	
Fibromyalgia	Diminished desire	Depression	Physiotherapy
		Vulvodynia	
		Vaginismus	
		Pain	Analgesics

RA rheumatoid arthritis, *AS* ankylosing spondylitis, *SS* Sjögren's syndrome, *SLE* systemic lupus erythematosus, *SSc* systemic sclerosis

[a] Could decrease libido

commonly encountered in women with fibromyalgia, most possibly leading to sexual dysfunction.

Other factors linked to sexual dysfunction include irritable bladder, vulvodynia, vaginismus, sexual abuse, and myofascial tender points [80].

In summary, sexual dysfunction in patients with fibromyalgia could be principally associated with depression and manifested with diminished desire. However, the characteristic symptoms of fibromyalgia such as generalized pain, stiffness, fatigue, and poor sleep, may also contribute to the occurrence of sexual dysfunction.

Treatment recommendations

One of the most important issues about the treatment of sexual dysfunction associated to rheumatic diseases is the fact that neither the sexual functioning is routinely addressed by physicians or health professionals, nor it is part of frequently used questionnaires to assess physical function or quality of life. For example, in Europe, especially UK health professionals should monitor the sexual activity of RA patients; however, a recent study showed that 66% of RA patients were never asked about the impact of RA on their sexual lives [23]. The common problem is communication, so an open communication including inquiry about sexuality into the routine care is the first step to improve the situation. To allow the patients to present problems and concerns without embarrassment is also important.

After an open communication is achieved, the treatment will depend on the specific patient's symptoms (Table I). However, there are some general recommendations including:

- discussion of the problems with the partner, principally about the partner's fear in causing pain or distress during sexual intercourse
- exploring different positions
- using analgesics drug, heat, and muscle relaxants before sexual activity in order to decrease pain, and
- exploring alternative methods of sexual expression [81]

There are similarities and differences in sexual function across the rheumatic diseases. For example, pain and depression are the most important issues and are common for all rheumatic diseases. Pain is an antiaphrodisiac [12], and it is difficult to imagine that patients will achieve sexual satisfaction when high levels of pain are experienced. Pain not only limits sexual satisfaction during intercourse but can also negatively influence sexual desire through the anticipated pain. Depression is significantly correlated with pain [82], so alleviating pain and controlling depression could help to break the vicious circle of pain, depression, and sexual dysfunction.

In women, dyspareunia is another common symptom for some rheumatic diseases and is due to principally vaginal dryness; whereas in men impotence and erectile dysfunction are common symptoms which are caused by different mechanisms (Table I).

Conclusions

Sexual functions in patients with rheumatic diseases have not been well studied. There are few publications about this frequent but underestimated clinical problem. The reasons of sexual dysfunction are multifactorial and comprise disease-related factors as well as therapy.

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