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Original Research

Impact of Ankylosing Spondylitis on Erectile Function

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Abstract

Objectives: Ankylosing spondylitis (AS), which is a chronic rheumatologic disorder, may be associated with erectile dysfunction (ED). The Aim of this study was to determine the incidence of erectile dysfunction in AS patients with a control group and to determine the risk factors for ED.

Methods: All demographic datas were recorded. Participants in both groups filled in the IIEF-5 (International Index of Erectile Function), Beck Depression Index (BDI) and Beck Anxiety Index (BAI) questionnaires, whereas, patients with AS additionally filled in Bath Ankylosing Spondylitis Disease Activity Index (BASDAI), Bath Ankylosing Spondylitis Functional Index (BASFI), Bath Ankylosing Spondylitis Metrological Index (BASMI) and Ankylosing Spondylitis Quality of Life (ASQoL) questionnaires. Patients were compared in terms of erectile function and predictive factors. Fifty patients with AS diagnosis and fifty healthy males were included in the study.

Results: ED of all degrees were present in the 38% and 30% of males in AS group and control group respectively with no statistical difference. However mean IIEF-EF domain score of AS group (22.3±7.0) was significantly lower than the control group (25.7±4.3) (p:0.004). In addition BDI and BAI scores were significantly higher in the AS group. When we have divided patients in AS group into two, according to the presence or absence of ED, mean IIEF-EF domain score of patients with ED were lower than AS patients without ED. No difference was detected in both groups in terms of age and the duration of disease. Patients who had ED in AS group had significantly higher scores in BASDAI, BASFI, depression and anxiety however no significant difference was detected among groups in terms of BASMI scores. Mean IIEF score was lower in patients with AS and this had negative correlation with BASDAI, BASFI, ASQoL, BDI and BAI scores.

Conclusion: Erectile function scores were slightly lower in AS group than the control group in our study. ED risk factors were shown as disease activitiy and psychological status.

Keywords: Ankylosing spondylitis; erectile function; quality of life.

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Ankylosing spondylitis (AS), is a form chronic rheumatismal disease usually accompanied by chronic low back pain, sacroiliitis and enthesitis. The prevalance of AS is approximately 0.7% with difference of among geographic area.[1] The etiology of the disease continues to be enigmatic. Inflammation of axial skeleton may cause a progressive vertebral deformity. AS is young male disease with a patient population younger than 40 years old. Since AS is a chronic disease with no mortality, the patients with the disease has a normal life span. The onset and the progression of the disease coincides with the most sexually active times of the patients and therefore possible sexual disabilities lead to impairment of their quality of lives.[2] Musculoskeletal associated symptoms such as chronic pain, fa-

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tigue, stiffness, depression, anxiety, negative body image severely impede physical and mental quality of life. The practitioners sometimes overlook problems such as disturbed psychology and erectile dysfunction while treating physical symptoms of the disease.[3] Erectile dysfunction (ED) is a sexual dysfunction characterized by the inability to develop or maintain an erection of the penis sufficient for satisfactory sexual performance. It has a negative impact both on patient`s quality of life and his relation with sexual partner.[4] In several case-controlled studies investigating the relation between AS and sexual dysfunction (SD), the prevalence of SD was higher for AS patients than normal males.[5] However no clear association was found between AS and erectile function. The higher ED prevalence rates in AS population could not be demonstrated in some of the studies.[6,7] The reasons of this discrepancy may be listed as small patient groups due to relative rare nature of the disease, differences of study designs, lack of validated questionnaires, usage of parameters such as disease span and activity. According to current literature several predictive factors such as morning stiffness, disease activity, depression etc. have been asserted for AS patients with SD.[7] However the predictive factors of ED in AS patients is not still clearly elucidated. Patients susceptibility to ED may be associated with both AS specific and related symptoms such as depression and anxiety. The aim of this study was to the determine ED prevalence between healthy males and AS patients via international validated and proven questionnaires and determine the predictive factors of ED in AS patients.

Methods

This prospective case-controlled trial was conducted among patients who were presented to the physical therapy department of a teaching hospital between 2012 and 2014. Fifty males who were diagnosed as AS according to modified New York criteria and 50 healthy males were included in the study after the approval of local ethic committee and signature of necessary consent forms (Ethic committee no: 198/2012). The demographic data of all the subjects were recorded and patients in both groups were similar in terms of age, education and socioeconomic levels. The inclusion criteria of the study were having a sexual partner for the last 3 months, consenting to the study while exclusion criteria were a history of pelvic surgery or radiation therapy, unregulated diabetes/hypertension and penile deformity.

The questionnaires used to analyze ED, International Index of Erectile Function (IIEF-5), and psychology of subjects, Beck depression index (BDI) and Beck anxiety index (BAI) were completed by the subjects themselves. Bath Ankylosing Spondylitis Disease activity index (BASDAI), Bath Ankylosing Spondylitis Functional Index (BASFI), Bath Ankylosing Spondylitis Metrological Index (BASMI) and Ankylosing Spondylitis specific quality of life (ASQoL) were only answered by patients with AS.

Assessment of clinical parameters: In AS group, the disease activity, functional status and spinal assessment was measured via BASDAI, BASFI and BASMI respectively.[8–11]

Assessment of quality of life: Disease specific quality of life was assessed via ASQoL which included 18 questions with binary answers (yes/no). The Turkish version was validated by Duruoz et al.[12] Assesment of Erectile functions (EF): IIEF-5 is one of most commonly used questionnaire for the assessment of EF and the validated Turkish version of it was used in our study.[13] This questionnaire evaluates the quality of subject`s EF for the prior 4 weeks. The six questions were scored between 0 to 5 (Q1, Q2, Q3,Q4, Q5, Q15). Erectile dysfunction was categorized as severe ED (1–10 points), moderate ED (11–16 points), mild-moderate (17–21 points), mild ED (22–25 points) and no ED (26-30 points).[14]

Assessment of Depression and Anxiety

Beck Anxiety Inventory (BAI): It is a 21-item self-report questionnaire with a focus on anxiety symptoms in which 13 Items are rated on a 4-point scale ranging from 0 (not at all) to 3 (severely). Validity and reliability studies of the Turkish have been performed previously.[15] Beck Depression Inventory (BDI): It is an instrument that assesses the presence and severity of depression and symptom levels. The 21 items of the inventory are 4 options Likert scale in design. Each question is scaled between 0 and 3 while the total score ranges from 0 to 63 with the cutoff score as 17. The Validity and reliability studies have been performed for the Turkish patients previously.[16]

Statistical analysis

The Statistical Package of Social Sciences for Windows (SPSS) version 20 was used for statistical analysis. We divided patients into 2 groups based on erectile dysfunction. Categorical variables were presented as numbers and percent ages and compared with ChiSquare test. Continuous variables were presented as means and standard deviations and compared with in dependent sample t test. Correlation analyses were evaluated using Pearson's correlation coefficient. Statistical significance was considered when two-tailed p value <0.05.

Results

Fifty patients with AS diagnosis and fifty healthy males were included in the study. The data of the both groups may be found at Table 1. The mean ages of group 1 and 2 were 37.7±7.6 and 37.0±6.8 respectively and no statistical difference was shown. Mean disease duration was determined as 10.8+9.3 years in the AS group. Erectile dysfunction of all degrees were present in the 38% (19 patients) and 30% (15 males) of males in group 1 and 2 respectively with no statistical difference. However mean IIEF-EF domain score of AS group (22.3±7.0) was significantly lower than the control group (25.7±4.3) (p:0.004) (Table 1).

Table 1. Clinical and demographic characteristics of the patients with AS and healthy controls

	Groups		
	AS (n=50)	Control (n=50)	p
Age (years)	37.7±7.6	37.0±6.8	0.648
Duration of illness (years)	10.8±9.3		NA
AS QoL	6.1±5.3	–	NA
BASDAI	2.9±2.4	–	NA
BASFI	2.9±2.5	–	NA
BASMI	7.2±2.6	–	NA
ED 19 (38.0%)	15 (30.0%)	0.404	
IIEF*	22.3±7.0	25.7±4.3	0.004
IIEF - grade			0.189
-none	31 (62.0%)	35 (70.0%)	
-mild	8 (16.0%)	10 (20.0%)	
-moderate	9 (18.0%)	4 (8.0%)	
-severe	2 (4.0%)	1 (2.0%)	
BAI*	14.2±7.7	7.4±4.5	0.000
BDI*	13.9±10.9	7.8±4.6	0.000
Beck (Above 17)	16 (32.0%)	4 (8.0%)	0.002

*: Mean + standard deviation; IIEF: international index of erectile function; BASDAI: bath ankylosing spondylitis disease activity index; BASFI: bath ankylosing spondylitis functional index; BASMI: bath ankylosing spondylitis metrological index; ASQoL: ankylosing spondylitis quality of life; ED: erectile dysfunction; BDI: beck anxiety index; BAI: beck anxiety index.

Table 2. AS patients with ED and Control group with ED

	Groups		
	AS (n=19)	Control (n=15)	p
Age (years)*	36.9±6.5	36.6±4.8	0.885
Duration of illness (years)*	10.8±8.2	-	NA
AS QoL*	9.3±5.7	-	NA
BASDAI*	4.9±2.1	-	NA
BASFI*	4.8±2.5	-	NA
BASMI*	7.5±2.8	-	NA
IIEF*	14.2±4.3	20.9±4.9	0.000
ED - grade			0.218
-mild	8 (42.1%)	10 (66.7%)	
-moderate	9 (47.4%)	4 (26.7%)	
-severe	2 (10.5%)	1 (6.7%)	
BAI*	20.7±6.8	12.3±4.0	0.000
BDI*	24.4±9.7	12.8±3.9	0.000
Beck (Above 17)	15 (78.9%)	4 (26.7%)	0.002

*: mean + standard deviation; IIEF:International Index of Erectile Function, BASDAI:Bath Ankylosing Spondylitis Disease Activity Index, BASFI: Bath Ankylosing Spondylitis Functional Index, BASMI: Bath Ankylosing Spondylitis Metrological Index, ASQoL: Ankylosing Spondylitis Quality of Life , ED: erectile dysfunction, BDI: Beck Anxiety Index, BAI: Beck Anxiety Index.

Furthermore mean IIEF EF domain score was also lower in AS patients with ED compared to control group with ED (14.2±4.3 & 20.9±4.9 p:0.001). In addition BDI and BAI scores were significantly higher in the AS group (table 2) The both group's patients with ED were categorized as mild, moderate and severe in terms of ED degree. In AS group, the number of patients with moderate or severe ED were higher than in control group however this difference was not reach statistically significant (Table 2). AS patients were categorized into 2 groups according to the presence or absence of ED and potential risk factors of ED were compared between two groups. The mean IIEF-EF domain scores these groups were 14.2±4.3 and 27.3±1.4 respectively. The risk factor analysis of ED in AS patients showed no difference in mean age and disease time between patients with and without ED (Table 3). BASDAI, BASFI, BDI and BAI scores were statistically higher for patients with ED. In addition, the disease specific quality of life was lower in AS patients with ED. No significant difference of BASMI scores was demonstrated between the groups.

Table 3. ED vs Without ED in AS patient

	Groups		
	ED (n=19)	Without ED (n=31)	p
Age (years)*	36.9±6.5	38.2±8.3	0.574
Duration of illness (years)*	10.8±8.2	10.8±10.1	0.999
AS QoL*	9.3±5.8	4.1±3.9	0.000
BASDAI*	4.8±2.1	1.7±1.6	0.000
BASFI*	4.8±2.5	1.8±1.8	0.000
BASMI*	7.5±2.8	7.0±2.5	0.509
IIEF*	14.2±4.3	27.3±1.4	0.000
BAI*	20.7±6.8	10.3±5.1	0.000
BDI*	24.4±9.7	7.6±5.3	0.000
Beck (Above 17)	15 (78.9%)	1 (3.2%)	0.000

*: mean + standard deviation; IIEF:International Index of Erectile Function, BASDAI:Bath Ankylosing Spondylitis Disease Activity Index, BASFI: Bath Ankylosing Spondylitis Functional Index, BASMI: Bath Ankylosing Spondylitis Metrological Index, ASQoL: Ankylosing Spondylitis Quality of Life , ED: erectile dysfunction, BDI: Beck Anxiety Index, BAI: Beck Anxiety Index.

Discussion

AS disease causes functional and vital limitations especially in young males by impeding daily routine activities of the individuals. Furthermore a significant rate of workforce is lost due to AS. Although the presence of a direct causality link between AS and ED is controversial, an impairment of erectile functions is suggested in both active and chronic phases of AS.[7]

Diabetes, cardiovascular diseases and hypertension are the most common organic causes of ED which may also occur as a result of psychological disturbance triggered by chronic diseases.[17] Etiological reasons of ED in chronic rheumatoid diseases are chronic pain, fatigue, stiffness, depression, anxiety, negative body image and diminished quality of life. While the association of sexual function and rheumatoid disease has been investigated in recent literature, the

specific assessment of erectile functions in patients with AS is a relatively neglected topic.[5,7]

In our study, the effects of AS activity on erectile functions was investigated in 50 patients with a control group of 50 healthy males. In these two groups which included males with similar mean ages, despite the rate of ED was similar between in both groups, IIEF-EF domain score was slightly lower in AS group compared to control group (22.3±7 and 25.7±4.3, p:0.004). A few case controlled well designed studies investigating sexual functions and AS were reported in the literature. IIEF questionnaire was used to assess the erectile function of 37 AS patients and 67 healthy males in the study of Bal et al. While no statistical difference of sexual function between males with and without AS was reported (35.1% vs 26.9%), a significant decrease was detected in the sexual desire domain score in AS group. The authors advocated the possibility of statistical significance, in case of increased patient population.[6] However a significant worsening of erectile capacity were reported by Sariyildiz et al and Pirildar et al.Similar results were published recently by Sanata T et al. Forty healthy males were compared with forty patients with AS in terms of ED. The mean IIEF-5 scores of AS and control group were reported as 22 and 29 respectively (p<0.0001).[18–20]

In a meta-analysis by Fan D et al including six studies, 340 AS patients and 337 healthy males, the erectile function of AS patients was significantly worse than their healthy counterparts (SMD –0.52, 95% CI –0.68 – 0.37). In another meta-analysis by Liu YF et al which included 5 case-controlled trials, a mean decrease of -3.07 was calculated in IIEF scores of patients with AS. Therefore, the variance in IIEF scores between our two groups is in accordance with the literature.[5,7] The risk factors of ED in AS patients were shown to be disease activity, time, patient age and psychic status in previous literature. In a well-designed, prospective case controlled study including 100 males in each group reported by Dhakad et al, a lower IIEF score (20.48±7.14 and 24.87±3.80) was found in AS group. Furthermore, erectile function was associated with age, anxiety, depression, longer disease duration and higher BASFI score.[21] The association of erectile function and disease activity was assessed via BASDAI, BASFI and BASMI questionnaires in our study. Spinal pain, peripheral joint stiffness, enthesis, fatigue and morning stiffness are the symptoms questioned in BASDAI questionnaires which evaluate the inflammation activity of AS. A negative correlation was detected between BASDAI, BASFI questionnaires and IIEF in AS patients with ED whereas no such correlation could be found for BASMI questionnaire. In a recent meta-analysis of 11 studies, a similar negative correlation between BASDAI, BASFI scores and IIEF was reported. On the other hand, morning stiffness was the only parameter related to ED in a study by Pirildar et al.[19]

No significant correlation could be proven between patient age, disease duration and ED in our study. In four separate studies, no association between disease duration and ED was shown but Dhakad et al reported that the mean disease durations were 76 months (AS with ED) and 46 months (AS without ED) in two groups respectively. In the same study, high patient age was also suggested as risk factor for ED. However, since AS is a disease of young males, the contribution of age for ED may be neglected. [21] ED was associated with anxiety and depression in this study. These factors may play a vital role in ED etiology not only for patients with rheumatoid diseases but in all cases. Several studies concur with the negative role of anxiety and depression on erectile function of AS patients.[18,22] Besides Shen et al shown the association between disturbed social function impeded by depression and sexual dysfunction.[23] Quality of life is impeded by both chronic diseases and sexual dysfunctions. The diminishment of quality of life (QoL) in patients with AS, a chronic inflammatory disease has already been established in the literature.[2] The effects of reduced QoL on erectile function of patients with AS was investigated in our study by using AS QoL questionnaire. The QoL was shown to be even lower in AS patients with ED when compared to AS patients without ED. A negative correlation between social functions (SF-36 questionnaire) and IIEF score and was reported by Bal et al.[6] Although the association of chronic inflammatory rheumatoid diseases such as AS and sexual functions is well established, the direct correlation between AS and erectile functions is still debated. Erectile function scores were slightly lower in AS group than the control group in our study. ED risk factors were shown as disease activity and psychological status. The practitioners in this field should be aware of ED and refer the patients to urologists if needed.

Disclosures

Ethics Committee Approval: Aldards.

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Conflict of Interest: None declared.

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