

# The relation of body image perception with body mass index, gender and disease activity in ankylosing spondylitis and rheumatoid arthritis

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## Abstract

**Aim:** Ankylosing spondylitis (AS) and Rheumatoid arthritis (RA) diseases causes physical deformities and chronic pain which lead to impairment in the body image perception (BIP) of the body.

**Material and Methods:** Sixty (N=60) AS patients and 55 RA patients were included into the study. Age, gender, body mass index (BMI), duration of diagnosis, education and disease activity of the patients were recorded.

**Results:** At the mean age of  $38.5 \pm 9.8$  years, 46 male (M) and 14 female (F) patients with AS were included in the study. In patients with AS, BIP score was positively correlated only with peripheral joint involvement ( $r = 0.32 / p = 0.005$ ). At mean age of  $52.1 \pm 13$  years, 12 male and 43 female patients with RA were included. The BIP score in RA patients did not correlate with any parameter. The BIP score was not significantly different between the two groups. In the AS group, BIP score was significantly higher in female gender ( $F = 110.2 \pm 29 / M = 95.8 \pm 20.5; p = 0.041$ ). In the whole group only in male gender BIP score was negatively correlated with duration of diagnosis ( $r = -0.264, p = 0.047$ ); it was positively correlated with BASFI ( $r = 0.306; p = 0.041$ ).

**Conclusion:** In the early active periods of the rheumatologic diseases and in the later stages of them with the progress of physical disability, BIP may get worse. A better understanding of factors affecting BIP will increase the success of treatment regimens.

**Keywords:** Rheumatoid Arthritis; Ankylosing Spondylitis; Body Image Perception.

## INTRODUCTION

Along with changes in the visual body appearance, a negative body image causes changes in response to treatment in the individual. However, the factors that affect body image perception have not been sufficiently investigated (1). Body perception is based on anthropometric and psychological factors. According to the current literature body dissatisfaction is affected by the environment, eating disorders and low self-esteem (2). Being a male is a risk factor for dissatisfaction, but being overweight is protective against dissatisfaction at advanced age. Obesity affects BIP negatively (3). Physical dissatisfaction, low physical self-acceptance, and treatment compliance are associated with poor physical health and quality of life (4).

Persistent pain is often associated with impaired BIP. Although many studies have examined the relationship

between pain and body image at the neural and physiological level (such as phantom limb pain), little is known about the psychopathological mechanism of the change in BIP that develops secondary to pain. People with persistent pain are more likely to complain of pain-related negative mood changes and decreased function. What kind of behavior is developed against body change in the case of chronic pain? (5) It is known that mood disorders such as depression are related to body image (7).

Physical disabilities usually cause the person's body image to deteriorate. In chronic rheumatologic diseases, both chronic pain and physical changes (such as posture abnormalities, gait disturbances, and joint deformities) can affect the BIP negatively. This affects treatment compliance and disease course. This situation requires serious psychological treatment to describe problems related to the body image (8,9). The BIP is affected in the

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negative direction due to the severity of the disease in chronic diseases (10). Here, we analyzed the association of BIP with body mass index (BMI), gender and disease activity in patients with Ankylosing Spondylitis (AS) and Rheumatoid Arthritis (RA).

## MATERIAL and METHODS

Sixty (N=60) AS patients and 55 RA patients were included into the study. Age, gender, BMI, duration of diagnosis, education and disease activity of the patients were recorded. AS diagnosis was evaluated according to the Criteria of Ankylosing Spondylitis International Society (ASAS) Classification, 2010. The severity of back pain was assessed with visual analog scale (VAS); disease activity with Bath Ankylosing Spondylitis Disease Activity Index (BASDAI); functional disability was assessed with the Bath Ankylosing Spondylitis Functional Index (BASFI). For RA diagnosis the American College of Rheumatology (ACR) 2010 criteria were used. The patient's global function was evaluated with visual analog scale (VAS, 0-10 cm) and disease activity was evaluated with disease activity score (DAS28) in RA patients. In our study, the principles of Helsinki declaration were considered and approved by the local ethics committee. Patients with known psychiatric or cognitive impairment, cerebrovascular disease, pregnancy, malignancy, concomitant inflammatory rheumatic diseases were excluded from the study.

### Body Image Perception Scale

Data related to the body image were obtained with the Body Image Perception Scale. The original name Body Cathexis Scale (BCS) was developed by Secard and Jurard in 1953. It is a measure of satisfaction with the body's 40 different body parts or functions. The scale used in our country is a five-point Likert-type measuring scale with 40 items. The most positive expression is 1 point and the most negative one is 5 points. Accordingly, the lowest total score is 40 and the highest total score is 200. Increasing the total score indicates that the satisfaction of the person's body parts or functions decreases, while the decrease in the score indicates increased satisfaction (11).

### Statistics

All statistical analyzes were performed using IBM SPSS version 19 (IBM Corp., Armonk, NY, USA). Descriptive data were presented as mean  $\pm$  SD (standard deviation) or median scores. The normality coherence of the variables was analyzed by the Kolmogorov-Smirnov test. Categorical data were reported as percentages and compared using the Chi-square test. Continuous data were reported as median with standard deviation or median minimum and maximum, and compared using the Student t-test or Mann Whitney U test according to normal distribution. A value of  $P < 0.05$  was considered statistically significant.

## RESULTS

At the mean age of  $38.5 \pm 9.8$  years, 46 male (M) and 14 female (F) patients with AS were included in the study. In patients with AS, BIP score was positively correlated only with peripheral joint involvement ( $r = 0.32 / p =$

$0.005$ ). At mean age of  $52.1 \pm 13$  years, 12 male and 43 female patients with RA were included. The BIP score in RA patients did not correlated with any parameter. Socio-demographic and disease - related data was given in Table 1.

Table 1. Demographic and Clinic Characteristics of the Groups

	AS (N=60)	RA (N=55)	P
Age (year)*	38.5 $\pm$ 9,8 yıl	52.1 $\pm$ 13	0.00
Gender (M/F)*	46/14	12/43	0.00
BMI (kg/m2)*	27 $\pm$ 4.1	28.8 $\pm$ 4.6	0.033
Education*			
Elementary/Middle	31	50	0.001
High/college	18	3	
Postdoc/University	2	2	
Duration of diagnosis (year)	9.6 $\pm$ 7.7	11.8 $\pm$ 7.7	0.137
BIP score (40-200)	99.2 $\pm$ 23.3	94 $\pm$ 25.5	0.265
General health VAS (0-10)	4.9 $\pm$ 2.5		
Morning stiffness VAS (0-10)	1.9 $\pm$ 2.2		
Back pain VAS (0-10)	4.8 $\pm$ 2.5		
Peripheral joint involvement (0-10)	3 $\pm$ 2.6		
BASDAI	3.9 $\pm$ 1.7		
BASFI	3.3 $\pm$ 2.1		
DAS28	-		
ESR	18.2 $\pm$ 14.9	26 $\pm$ 21.6	0.74
CRP	11.2 $\pm$ 9.9	12 $\pm$ 9.6	0.71

Abbreviations: AS: Ankylosing spondylitis; RA: rheumatoid arthritis; BIP: body image perception; VAS: visual analog scale; ESR: Erythrocyte sedimentation rate; CRP: C-reactive protein; DAS28: disease activity score. \*statistically significant difference according to  $P < 0.05$

The BIP score was not significantly different between the two groups. In the AS group, BIP score was significantly higher in female gender ( $F = 110.2 \pm 29 / M = 95.8 \pm 20.5$ ;  $p = 0.041$ ). There was no gender difference in the RA group according to BIP score. In the whole group only in male gender BIP score was negatively correlated with duration of diagnosis ( $r = -0.264$ ,  $p = 0.047$ ); it was a positively correlated with BASFI ( $r = 0.306$ ;  $p = 0.041$ ). In both groups BIP score was not related with BMI.

## DISCUSSION

Pain is the main manifestation of many rheumatologic diseases but, at least initially, the mechanisms involved in the genesis, amplification and chronisation of the persistent pain characterising the various situations can be very different (12). Although the underlying mechanism of chronic pain is different, it causes central and peripheral sensitization in inflammatory rheumatologic diseases. Psychiatric comorbidities such as depression and anxiety are also frequently accompanied. Current evidence supports the dissatisfaction of body image with biological processes in relation to psychological and

biological factors. In the study of Shen B et al, changes in BIP have been shown to cause psychopathological changes including anxiety and depression (13). Osumi M et al. have shown that negative BIP results in increased pain and pain sensitivity (1).

Ankylosing spondylitis (AS) is the most common inflammatory rheumatic disease and is associated with postural changes. It affects mainly axial joints and causes a rigid spine in the sacrum. Dorsal hyperkyphosis causes standing upright and difficulty in daily activities. Individuals with AS usually have an increase in thoracic kyphosis and a decrease in lumbar and cervical movements (14). AS may cause arrest in axial and peripheral joints and deterioration of joint mobility. Disturbed axial mobility due to vertebral ankylosis can cause changes in postural control (15). In addition, in a study by Swascha Z et al. quantitative measurements with the stereophotogrammetric system showed differences in knee angle, decrease in pelvic tilt, hip and heel angle, and postural measurements (14). Standing postural control on the frontal plane is particularly variable and may be related with high risk of falls. In the study by Aydın E et al showed that the alterations in the posture may have effects on the plantar pressures in patients with AS (16). In spondyloarthritis, walking anomalies due to deterioration of lower extremity foot functions are frequently seen. Patients usually develop improved walking adaptations (17). Physical function and quality of life are impaired in patients with AS (18). AS limits spinal mobility and results in irreversible structural changes and consequent deterioration of physical function and reduced quality of life (19). Regular exercise has a positive effect on the body image, but it does seem that the exercise program does not affect the BIP, which is more closely related to mood (20). According to the study by Boyington et al. BIP was affected in the majority of participants, and the specific focus was on their affected body parts, cognitive function, self-identity, and quality of life (21).

RA is a chronic inflammatory autoimmune condition characterized by systemic inflammation in peripheral synovial joints. In RA, the pain was thought to be inflammatory. Frequently the disease can affect physical, psychological and social functions. The condition is not curable - although drug therapy can be used to reduce inflammation - and patients often experience daily symptoms of joint pain and stiffness, fatigue and functional limitations (22). According to the current literature, RA patients had a poor body image and it is directly correlated with self-esteem, function, and quality of life (24-26). Boyington JE et al<sup>10</sup> obtained negative results in disease-related body parts (joints), mental function, self-confidence and healthcare experience, activity limitations and quality of life in patients with RA and FMS. In the study by Černelič-Bizjak M<sup>27</sup> et al, body image dissatisfaction has been associated with inflammation markers such as C-reactive protein (CRP) and tumor necrosing factor (TNF)-alpha. Similarly, the study by Sabiston C<sup>28</sup> et al found that CRP and body

image dissatisfaction were associated with obesity in adolescents. In the study of Huygen AC<sup>29</sup> et al BIP was found to be similar with healthy controls in children with juvenile idiopathic arthritis. We see that BIP is related with high inflammation. According to the study by Husni ME et al<sup>30</sup> the psychosocial burden of psoriatic arthritis negatively affects quality of life. According to the study by Rzeszutek et al<sup>31</sup> trauma symptoms and body image dimensions were significant predictors of pain intensity among men suffering from chronic pain.

Summarily, in patients with chronic inflammatory joint diseases the BIP is negatively affected due to chronic pain, deformities in joints, postural abnormalities, accompanying psychiatric problems, poor quality of life etc.

According to our study, we analyzed BIP in both of AS and RA diseases and found that the BIP score in both AS and RA patients was not related with disease severity. In AS group in females BIP score was higher than males. In all group, in male gender BIP score was negatively correlated with duration of diagnosis and positively correlated with BASFI. We may say that in the early active periods and in the later stages of the disease with the progress of physical disability, BIP may get worse in AS. We see gender differences in BIP as expected. Unlike the literature, BIP did not correlate with inflammation markers such as CRP and ESR. Also the BIP results were similar in both diseases. Both diseases are common to each other in many ways and are completely different diseases pathophysiologically. RA affects hand small joints, while AS effects mainly axial joints. They are different from each other in terms of joint involvement. But both are life-long diseases that cause chronic pain and physical disability. Unlike the current literature, we have seen that BMI has no effect on BIP.

#### Limitation of the study

The low number of patients and the absence of the control group are study limitations.

We were also predicted that BIP was related with BMI.

## CONCLUSION

In the early active periods and in the later stages of the disease with the progress of physical disability, BIP may get worse. Also we see high BIP scores in female AS patients. A better understanding of factors affecting BIP will increase the success of treatment regimens. The BIP should be taken into account in the follow up of the chronic rheumatologic joint diseases like RA and AS.

*Competing interests: The authors declare that they have no competing interest.*

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## REFERENCES

1. Osumi M, Imai R, Ueta K, et al. Negative body image associated with changes in the visual body appearance increases pain perception. PLoS One. 2014;9:e107376.

2. Zaccagni L, Masotti S1, Donati R, et al. Body image and weight perceptions in relation to actual measurements by means of a new index and level of physical activity in Italian university students. *J Transl Med.* 2014;12:42.
3. Menezes TN, Brito KQ, Oliveira EC, et al. body image perception and associated factors among elderly residents in a city in northeast brazil: a population-based study. *Cien Saude Colet.* 2014;19:3451-60.
4. Flanagan EW, Perry AC. Perception of Physical Fitness and Exercise Self-Efficacy and Its Contribution to the Relationship between Body Dissatisfaction and Physical Fitness in Female Minority Children. *Int J Environ Res Public Health.* 2018;15.pii: E1187.
5. Sündermann O, Rydberg K, Linder L, et al. "When I feel the worst pain, I look like shit" - body image concerns in persistent pain. *Scand J Pain.* 2018;18:379.88.
6. Trinquinato I, Marques da Silva R, Ticona Benavente SB, Gender differences in the perception of quality of life of patients with colorectal cancer. *Invest Educ Enferm.* 2017;35:320-9.
7. Paans NPG, Bot M, Brouwer IA, et al. Contributions of depression and body mass index to body image. *J Psychiatr Res.* 2018;103:18-25.
8. de Menezes TN, Oliveira ECT, Silva NA, et al. Body image perception and associated cognitive factors among elderly. *Salud Publica Mex.* 2018;60:122-3.
9. Guenther V, Locher E, Falkenbach A, et al. Body image in patients with ankylosing spondylitis. *Clin Exp Rheumatol.* 2010;28:341-7.
10. Boyington JE, Schoster B, Callahan LF. Comparisons of Body Image Perceptions of a Sample of Black and White Women with Rheumatoid Arthritis and Fibromyalgia in the US. *Open Rheumatol J.* 2015;9:1-7.
11. Kundakçı, AH. Üniversite Öğrencilerinin Yeme Tutumları, Benlik Algıları, Vücut Algısı ve Stres Belirtileri Açısından Karşılaştırılması, Yayınlanmamış Yüksek Lisans Tezi, Ankara Üniversitesi Sosyal Bilimler Enstitüsü, Ankara. 2005.
12. Cazzola M, Atzeni F, Boccassini L, et al. Physiopathology of pain in rheumatology. *Reumatismo.* 2014;66:4-13.
13. Sawacha Z, Carraro E, Del Din S, et al. Biomechanical assessment of balance and posture in subjects with ankylosing spondylitis. *J Neuroeng Rehabil.* 2012;9:63.
14. Shen B, Zhang A, Liu J, et al. Body image disturbance and quality of life in Chinese patients with ankylosing spondylitis. *Psychol Psychother.* 2014;87:324-37.
15. Vergara ME, O'Shea FD, Inman RD, et al. Postural control is altered in patients with ankylosing spondylitis. *Clin Biomech (Bristol, Avon).* 2012;27:334-40.
16. Aydin E, Turan Y, Tastaban E, et al. Plantar pressure distribution in patients with ankylosing spondylitis. *Clin Biomech (Bristol, Avon).* 2015;30:238-42.
17. Carroll M, Parmar P, Dalbeth N, et al. Gait characteristics associated with the foot and ankle in inflammatory arthritis: a systematic review and meta-analysis. *BMC Musculoskelet Disord.* 2015;16:134.
18. Ariza-Ariza R, Hernández-Cruz B, Navarro-Sarabia F. Physical function and health-related quality of life of Spanish patients with ankylosing spondylitis. *Arthritis Rheum.* 2003;49:483-7.
19. Mustur D, Vesović-Potić V, Stanisavljević D, et al. Assessment of functional disability and quality of life in patients with ankylosing spondylitis. *Srp Arh Celok Lek.* 2009;137:524-8.
20. Hider S, Wong M, Ortiz M, et al. Does a regular exercise program for ankylosing spondylitis influence body image? *Scand J Rheumatol.* 2002;31:168-71.
21. Boyington JE, Schoster B, Callahan LF. Comparisons of body image perceptions of a sample of black and white women with rheumatoid arthritis and fibromyalgia in the US. *Open Rheumatol J.* 2015;9:1-7.
22. Ryan S. Psychological effects of living with rheumatoid arthritis. *Nurs Stand.* 2014;29:52-9.
23. Canaipa R, Castro-Caldas A, Moreira JM, et al. Impaired pain modulation in fibromyalgia patients in response to social distress manipulation. *Clin J Pain.* 2017;33:611-9.
24. Jorge RT, Brumini C, Jones A, et al. Body image in patients with rheumatoid arthritis. *Mod Rheumatol.* 2010;20:491-5.
25. Macsween A, Brydson G, Fox KR. Physical self perceptions of women with rheumatoid arthritis. *Arthritis Rheum.* 2004;51:958-63.
26. Plach SK, Stevens PE, Moss VA. Corporeality: women's experiences of a body with rheumatoid arthritis. *Clin Nurs Res.* 2004;13:137-55.
27. Černelič-Bizjak M, Jenko-Pražnikar Z. Impact of negative cognitions about body image on inflammatory status in relation to health. *Psychol Health.* 2014;29:264-78.
28. Sabiston C, Castonguay A, Barnett T. Body image and C-reactive protein in adolescents. *Int J Obes (Lond).* 2009;33:597-600.
29. Huygen AC, Kuis W, Sinnema G. Psychological, behavioural, and social adjustment in children and adolescents with juvenile chronic arthritis. *Ann Rheum Dis.* 2000;59:276-82.
30. Husni ME, Merola JF, Davin S. The psychosocial burden of psoriatic arthritis. *Semin Arthritis Rheum.* 2017;47:351-60.
31. Rzeszutek M, Oniszczenko W, Schier K, et al. Sex differences in trauma symptoms, body image and intensity of pain in a Polish sample of patients suffering from chronic pain. *Psychol Health Med.* 2016;21:827-35.