OPEN AIMJ ORIGINAL ARTICLE

Features of Ankylosing Spondylitis in Egyptian females

Rheumatology and Rehabilitation

Mazen Hassan Mosaad Habata [1]*M.B.B.Ch; Sameh Ahmed Fathy El Zayat [2]MD; Mohamed Reda Awad [2]MD and Mohamed Hanafy [2]MD.

Corresponding Author:
Mazen Hassan Mosaad Habata
mazen7abata@gmail.com

Received *for publication May 22, 2022;* ***Accepted*** *November 22, 2022;* ***Published online*** *November 22,2022.*

doi: *10.21608/aimj.2022.140247.1952*

Citation: *Mazen H. , Sameh A. and Mohamed R. Features of Ankylosing Spondylitis in Egyptian females. AIMJ. 2022; Vol.3-Issue11 : 203-209.*

[1]Rheumatology and Rehabilitation Department, Agouza rehabilitation center of armed forces, Egypt.

[2]Rheumatology and Rehabilitation Department, Faculty of Medicine, Al-Azhar University, Cairo , Egypt.

ABSTRACT

Background: In the past, it was believed that ankylosing spondylitis (AS) mostly affected males. However, more recent statistics indicate a more even gender ratio. Sadly, axial spondyloarthritis (axSpA) research often includes a limited number of female participants, and results are typically not classified according to gender distribution.
Aim of The Work: To make a comparative study between males and females SPA specially ankylosing spondylitis to help us in a good diagnosis and management .
Patients and Methods: This is a comparative study which included 60 adult ankylosing spondylitis patients divided into 30 males and 30 females diagnosed according to New York Revised Criteria 2016 for too early AS Diagnosis.
Results: As regard the disease duration, there was delay in diagnosis which is statistically significant between the two groups with a median difference in male group 1.5 years and in the female group was 5.5 years, also male patients have lumbar limitation more than female patients, female patients tend to have Enthesitis and peripheral arthritis more than male patients. According to extra-articular manifestation, there were no significant difference in both sexes.
Conclusion: Understanding sex differences in ankylosing spondylitis is essential for both diagnosis and treatment.

Keywords: *Ankylosing Spondylitis; Sacroiliitis; Enthesitis; Acute Anterior Uveitis.*

Disclosure: *The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was paid for by the authors.*
Authorship: *All authors have a substantial contribution to the article.*

INTRODUCTION

Spondyloarthritis (SpA) is a group of rheumatic illnesses with comparable hereditary and clinical features. On the basis of the afflicted body regions, these disorders are classified as either axial (axSpA) or peripheral (pSpA). AS is an autoimmune disorder that affects the spine's joints, sacroiliac joints, and surrounding tendons and ligaments. In extreme situations, this inflammation may lead to the development of fibrosis and calcification, resulting in the loss of spinal fusion, spinal flexibility, and a "bamboo" posture. Back discomfort, growing spinal stiffness, and inflammation of the hips, shoulders, peripheral joints, and fingers/toes are the most prominent clinical signs. Inflammatory bowel disease and acute anterior uveitis may also develop together extra-articular symptoms. These extra-articular symptoms vary across East Asian and Caucasian populations. [1]

It was suggested over some years ago through evidence that AS affects women and men differently; the onset of the disorder is often more rapid in males, whereas in women, the diagnosis is typically delayed. Men have lower disease activity as measured by the Assessment of Spondylarthritis international Society (ASAS)-endorsed Disease Activity Score (ASDAS) and the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) and a better quality of life by Ankylosing Spondylitis Quality of Life Questionnaire (ASQol), but poorer spinal mobility (Bath Ankylosing Spondylitis Metrology Index, or BASMI) and a more severe by Bath Ankylosing Spondylitis Radiology Index (BASRI). [2] Compared to males, women experienced a greater frequency of arthritis, peripheral arthritis, enthesitis, and dactylitis, a poorer response to anti-TNF drugs and a lower quality of life. [3]

On average, women sustain less sacroiliac joint and spinal injuries than males. [4]

Several extra-articular manifestations (EAM) were shown to be favorably correlated with female gender. [5]

The aim of this research is to draw attention to the underdiagnosis of AS patients who are female by merging available data on gender variations in AS.

PATIENTS AND METHODS

This is a comparative study which included 60 adult ankylosing spondylitis patients divided into 30 males and 30 females diagnosed according to New York Revised Criteria (2016) for too early AS diagnosis.

Patients were enrolled from Outpatient clinic and the inpatients of Internal Medicine and Rheumatology Departments at:

Agouza Rheumatology and Rehabilitation center of armed forces.

Nasser Institute Hospital.

Patients were subjected to the following:

Full History taking as age, gender, disease duration, drug and family history.

Full general and local musculoskeletal examination with special emphasis on axial spine (cervical, thoracic and lumbosacral regions) and examination of sacroiliac joints.

On examination, patients may display evidence of spinal deformity, such as loss of normal lumbar lordosis and kyphosis. Touching the sacroiliac joints may be uncomfortable, and the normal movement of the lumbar and cervical spines, as well as chest expansion, may be impaired. AS is a common cause of a decrease in the range of motion (flexion) of the lumbar spine, as measured by the Schober test.[6]

Schober's test technique:

While the patient is standing, the examiner marks the L5 spinous process by drawing a horizontal line across the patient's back. The height of the second line was 10 cm more than that of the first. The patient is then instructed to reach for his or her toes, and the distance between two lines is measured with the patient fully flexed. The difference between measurements recorded in the upright and flexed positions indicates lumbar flexion. [6]

Positive Schober's Test: Less than 5cm increase in length with forward flexion: Decreased lumbar spine range of motion, ankylosing spondylitis.

Modified Schober :Mark with a pen the midpoint between the posterior superior iliac spines (PSIS). Mark two spots with your measuring tape: (1) one that is 10 cm above the PSIS, and (2) one that is 5 cm below it. As the client bends their spine as much as possible, the distance between the superior and inferior markers is measured and recorded. Less than a 5cm length gain during forward flexion: Ankylosing spondylitis is characterized by a decreased lumbar spine range of motion.

The best test for identifying clinical sacroiliitis is a positive sacral push test or > 2+ pain on sacroiliac joints or the buttock generated by direct vertical pressure on the center of the sacrum in the prone position.

Laboratory investigations: Complete blood count (CBC), C-Reactive Protein (CRP), Erythrocyte Sedimentation rate (ESR) in first hour, liver enzymes and serum creatinine.

Imaging investigations:Plain X-Ray on sacro-iliac joint and spine and MRI on sacro-iliac joint and spine.

Assessment of disease activity using :

The Ankylosing Spondylitis Disease Activity Score (ASDAS)-CRP

Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) .

Statistical analysis:

SPSS version 21 was utilized for analytical purposes. Quantitative data were presented with Mean Standard Deviation, median, range, and Interquartile range and analyzed with the t test (for parametric data) or the Mann Whitney U test (in case of non-parametric data). When categorical data were presented as numbers and percentages, the chi-square test was substituted for the Monte Carlo Exact or Fischer Exact test when deemed unsuitable. P value < 0.05 was considered statically significant.

RESULTS

Sociodemographic characteristics	Sex		Test of significance	p
	Males (n=30)	Females (n=30)		
Age			**t**	**0.806**
Mean ± SD.	39.2 ± 9.58	39.8 ± 11.32	0.246	
Min. – Max.	22.0 – 52.0	23.0 – 60.0		

Table 1: Sociodemographic characteristics in both sexes.
t: Student t test
As regard Sociodemographic characteristics in both sexes, the age was insignificantly different between both studied groups (P value 0.806).

	Sex		Test of significance	p
	Males (n=30)	Females (n=30)		
Age of onset (yrs.)			**U**	**0.023***
Median (IQR)	29.0 (20.0 – 35.25)	25.5 (18.0 – 30.5)	296.500	
Disease duration (yrs.)			**U**	**0.894**
Median (IQR)	7.0 (4.75 – 14.25)	7.5 (5.0 – 15.0)	441.000	
Onset of diagnosis (yrs.)			**U**	**<0.001***
Median (IQR)	5.0 (2.0 – 10.0)	2.0 (1.0 – 3.0)	196.000	
delay in diagnosis (yrs.)			**U**	**<0.001***
Median (IQR)	1.5 (0.0 – 5.25)	5.5 (3.0 – 14.0)	183.500	

Table 2: Onset of complaints, diagnosis in both sexes

U: Mann Whitney U test IQR: Interquartile range *p≤0.05 (Statistically significant), <0.001 (Highly significant)
Regarding the age onset, it was significantly higher in males' group than females' group (P value 0.023).
The disease duration in the male group was 7 years while in female group was 7.5 years with no difference between both groups while the onset of diagnosis was statistically difference between both groups as the median was 5 years in males and less in females (median was 2 years).
As regard the delay in diagnosis which is statistically significant between the two groups (P value <0.001) with a median difference in male group was 1.5 years and in the female group was 5.5 years.

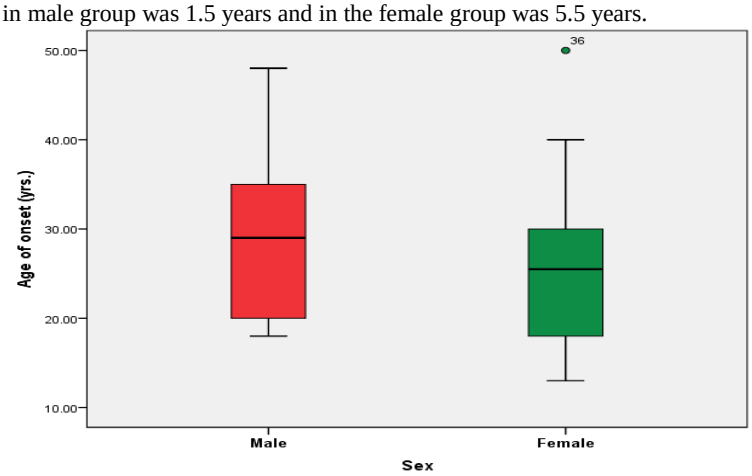

Fig. 1: Box and Whisker plot for age of onset in both sexes

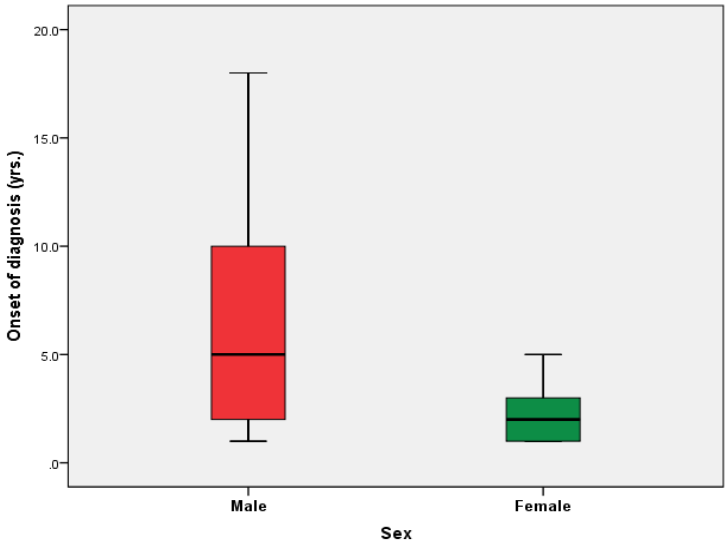

Fig. 2: Box and Whisker plot for onset of diagnosis in both sexes

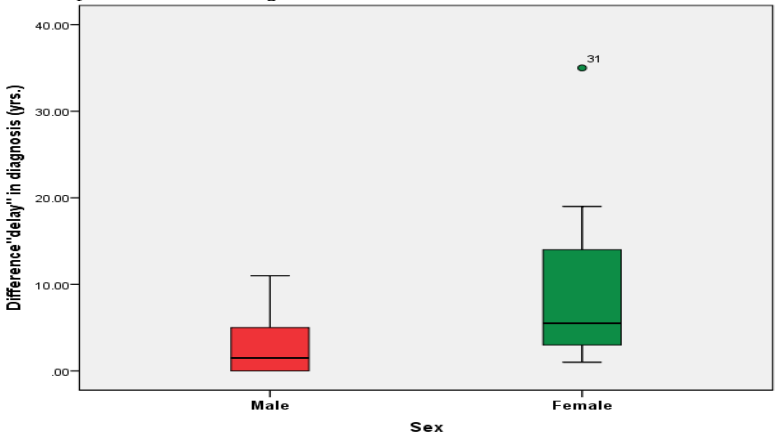

Fig. 3: Box and Whisker plot for delay in diagnosis in both sexes

	Sex		Test of significance	p
	Males (n=30)	Females (n=30)		
Inflammatory LBP			**FE**	**0.787**
Probable	11	12	1.209	
	36.7%	40.0%		
Definite	19	18		
	63.3%	60.0%		
Family history			**MC**	**1.000**
No family history	23	23	0.311	
	76.7%	76.7%		
2nd degree or more than 1 member of family	3	2		
	10.0%	6.7%		
1st degree	4	5		
	13.3%	16.6%		
Lumber limitation			χ^2	**<0.001***
No	2	17	17.330	
	6.7%	56.7%		
Lumber limitation	28	13		
	93.3%	43.3%		
Clinical SCI			χ^2	**0.488**
No	6	4	0.480	
	20.0%	13.3%		
SCI	24	26		
	80.0%	86.7%		
Enthesitis and/or arthritis			χ^2 0.373	**0.542**
No	8	6		
	26.7%	20.0%		
Enthesitis and/or arthritis	22	24		
	73.3%	80.0%		
SI			**MC**	**0.007***
No	1	3	9.574	
	3.3%	10.0%		
Unilateral SI ≥GII	1	9		
	3.3%	30.0%		
Bilateral SI ≥G II	28	18		
	93.4%	60.0%		
HLA B 27			χ^2	**0.197**
No	22	26	1.667	
	73.3%	86.7%		
HLA B27	8	4		
	26.7%	13.3%		
Score			**U**	**0.004***
Median (IQR)	9.0 (7.0 – 9.25)	7.0 (5.75 – 8.0)	258.500	

Table 3: 2016 new york revised criteria for too early diagnosis of AS in both sexes
FE: Fischer Exact test MC: Monte Carlo Exact test
χ 2: Chi square test
*p≤0.05 (Statistically significant), <0.001 (Highly significant)
Regarding New york revised criteria for too early diagnosis of AS in both sexes (2016) there was significant difference between the two arms in lumbar limitations (93.3 % in male group) , SI (30 % in female group is Unilateral SI ≥ GII while in male group 93.4 % is Bilateral SI ≥ G II) , and Score (median score in male was 9 and in female was 7) while the difference between the two groups in the other items which are inflammatory LBP, Family history, Clinical SCI , HLA B27, Enthesitis and/or arthritis found to be insignificant.

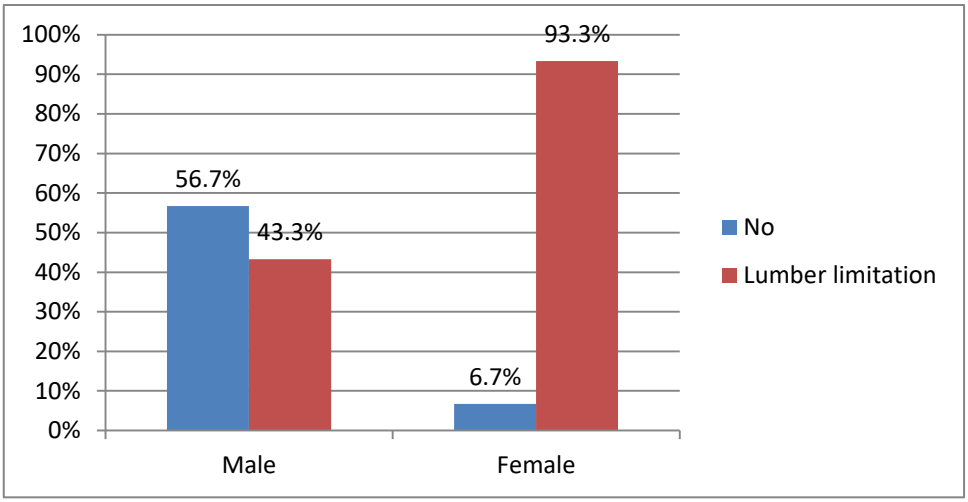

Fig. 4: Lumber limitation in both sexes

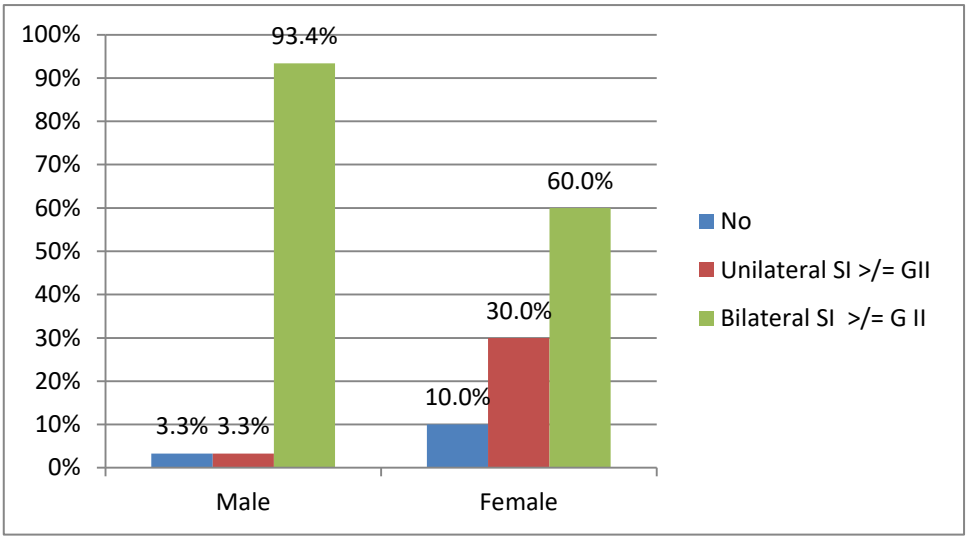

Fig. 5: SI in both sexes

	Sex		Test of significance	p
	Males (n=30)	Females (n=30)		
Eye involvement			χ^2	**0.592**
No	20	18	0.287	
	66.7%	60.0%		
Yes	10	12		
	33.3%	40.0%		
Lung			**FE**	**0.353**
No	26	29	1.964	
	86.7%	96.7%		
Yes	4	1		
	13.3%	3.3%		
Heart			**FE**	**1.000**
No	28	29	0.351	
	93.3%	96.7%		
Yes	2	1		
	6.7%	3.3%		
GIT			**FE**	**1.000**
No	27	28	0.218	
	90.0%	93.3%		
Yes	3	2		
	10.0%	6.7%		

Table 4: Extra-articular manifestation in both sexes
FE: Fischer Exact test χ 2: Chi square test

As regard the extra-articular manifestation which are eye involvement, lung, heart and GIT there were no significant different in both sexes as P value was 0.592,0.353,1.000,1.000 respectively).

	Sex		Test of significance	p
	Males (n=30)	Females (n=30)		
ASDAS CRP			**t**	**0.704**
Mean ± SD.	3.1 ± 0.86	3.0 ± 0.83	0.382	
Min. – Max.	1.6 – 5.4	2.0 – 4.9		
BASDAI			**t**	**0.469**
Mean ± SD.	3.1 ± 1.68	3.4 ± 1.51	0.730	
Min. – Max.	0.4 – 7.4	1.0 – 5.8		

Table 5: Assesement of disease activity in both sexes
t: Student t test

In assessment of disease activity in both groups there was no significant difference as P value was 0.704 in ASDAS CRP and 0.469 in BASDAI.

DISCUSSION

In our study we found that the mean age in the male group was 39.2 ± 9.58 while in the female group was 39.8 ± 11.32 with no significance difference between both groups

Other study performed by Maysa Haroon et al. in 2018 reported that the mean age is 35.4 ± 9.3 in males and 33.1 ± 7.4 in females.[7]

Women had greater mean age (47.6±13.7 years versus 46.5±13.9 years for men) as Euthalia and Shahzabeen reported in 2011.[8]

The age onset was significantly higher in males' group than females' group with P value=0.023.

Which came in near concordance with Maysa Haroon et al. as regard age of onset in males only where, it is 29.4 ± 6.9 but in females there is disagreement where the age of onset found to be 28.9 ± 6.8 years .[7]

While HMY et al., in 2020 reported that the mean age of onset is 34.4 ± 12.5 in males and 35.5 ± 13.8 in females.[9]

As regard ''delay in diagnosis'' in current study which is statistically significant between the two groups (P value <0.001) with a median duration in male group was 1.5 years and in the female group was 5.5 years.

In general, women take longer to receive an AS diagnosis than males. A meta-analysis of 23,899 patients (32,3% women) from 42 studies revealed a considerably greater delay in diagnosis for women than for males 8.8 vs. 6.5 years, respectively (P <0.01). [10] Only one research found that males had a longer diagnostic delay than females, 9.9 versus 6.3 years, respectively. [11]

As regard inflammatory low back pain, we found that 63.3 % of male patients have definite inflammatory low back pain versus 36.7 % have probable LBP, while in female the percentage was (60% and 40%) definite and probable inflammatory low back pain respectively with no significant difference between both groups, with an agreement of the published study.

Regarding lumbar restriction, we discovered that 93,3 percent of male patients compared to 43,3 percent of female patients had it. Lumber limitation of motion (LOM) was observed in all directions of flexion/extension, bending to the right and left, and rotation to the right and left. Applying a positive Schober's test for LOM in flexion. [12] Our results were consistent with results of Maysa Haroon et al. who stated that lumbar limitation more in males than females manifested by Schöber's test which was more limited and the finger-to-floor distance more increased in males (4.5 ± 0.8 cm and 40.7 ± 9.2 cm vs 4.9 ± 0.7 cm and 27.9 ± 9.7 cm; p=0.046 and p<0.001 respectively).[7]

As regard clinical sacroiliitis ,80% of male patients versus 86.7% of female patients were found clinically to have sacroiliitis with no significant difference between both groups.

As regard Enthesitis and peripheral arthritis: in current study we found that female patients tend to have Enthesitis and peripheral arthritis more than male patients (80% of female patients versus 73.3% of male patients) but with no significant difference between both groups. Our findings were consistent with those of Tournadre et al. (2013), who discovered that women are more likely to develop enthesitis. [13] In 2011, Slobodin et al. reported that women with axSpA have greater pelvic, heel, and broad pain; widespread pain in women more than doubles the SpA diagnostic time required. [14] Rusman et al. report that enthesitis is more prevalent and severe in female patients. [3] Despite male patients' slower radiological progression, this study may explain why female patients have the same or even a greater disease burden than male patients.

As regard the extra-articular manifestation which are eye involvement, lung, heart and GIT there were no significant difference in both sexes as P value was 0.592,0.353,1.000,1.000 respectively).

In current study, disease activity was evaluated using (ASDAS)-CRP and BASDAI, there was no significant difference between both groups as P value was 0.704 in ASDAS CRP and 0.469 in BASDAI.

Our results also were consistent with results of van der Horst et al. and Webers et al., 2016 that showed no difference in physical function or disease activity over time between both sexes.[15,16]

CONCLUSION

Understanding the sex variations in ankylosing spondylitis is crucial for both diagnosis and therapy.

Conflict of interest : none

REFERENCES

1. Lindström U, Olofsson T, Wedrén S, et al. Impact of extra-articular spondyloarthritis manifestations and comorbidities on drug retention of a first TNF-inhibitor in ankylosing spondylitis: A population-based nationwide study. *RMD Open*. 2018; 4(2): e000762.
2. Landi M, Maldonado-Ficco H, Perez-Alamino R, et al. . Gender differences among patients with primary ankylosing spondylitis and spondylitis associated with psoriasis and inflammatory bowel disease in an iberoamerican spondyloarthritis cohort. *Medicine (Baltimore)*.2016 ;95(51):e5652.
3. Rusman T, van Vollenhoven RF, van der Horst-Bruinsma IE . Gender Differences in Axial Spondyloarthritis: Women Are Not So Lucky. *Curr Rheumatol Rep*.2018 ;20(6):35. 10.1007/s11926-018-0744-2.
4. Deodhar A, Strand V, Kay J, Braun J. . The term 'non-radiographic axial spondyloarthritis' is much more important to classify than to diagnose patients with axial spondyloarthritis. *Ann Rheum Dis*.2016 ;75:791–4.
5. Zarco P, Gonzalez CM, Rodriguez de la Serna A et al. .Extra-articular disease in patients with spondyloarthritis.Baseline characteristics of the spondyloarthritis cohort of the AQUILES study. *Reumatol Clin*. 2015 ;11:83–9.
6. Rezvani A, Ergin O., Karacan I. . Validity and reliability of the Metric Measurements in the Assessment of Lumbar Spine Motion in patients with Ankylosing Spondylitis. Lippincott Williams & Wilkins, *SPINE* . 2012 ; pp E1189-E1196 (level of Evidence: 1B).
7. Maysa M Haroon, Safaa Sayed & Tamer A Gheita .Gender differences in ankylosing spondylitis patients: Relation to clinical characteristics, functional status and disease activity.*International Journal of Clinical Rheumatology*.2018 ;13(4),258-62.
8. Roussou E, Sultana S. Spondyloarthritis in women: differences in disease onset, clinical presentation, and Bath Ankylosing Spondylitis Disease Activity and Functional indices (BASDAI and BASFI) between men and women with spondyloarthritides. *Clin Rheumatol.* 2011 Jan;30(1):121-7. doi: 10.1007/s10067-010-1581-5. Epub 2010 Sep 30. PMID: 20882310.
9. HMY de Jong, JE Paramarta, JJH de Winter et al. . Differences between females and males in axial spondyloarthritis: data from a real-life cross-sectional cohort.*Scand J Rheumatol*. 2020 ;49:28–32.
10. Jovani V, Blasco-Blasco M, Ruiz-Cantero MT, Pascual E.Understanding how the diagnostic delay of spondyloarthritis differs between women and men: systematic review and metaanalysis.*J Rheumatol*.2017 ;44:174–83.
11. Bandinelli F, Salvadorini G, Delle Sedie A, Riente L, Bombardieri S, Matucci-Cerinic M.Impact of gender, work, and clinical presentation on diagnostic delay in Italian patients with primary ankylosing spondylitis. *Clin Rheumatol*.2016 ;35(2):473–8.
12. Strand V, Rao SA, Shillington AC, et al. .Prevalence of axial spondyloarthritis in United States rheumatology practices: Assessment of SpondyloArthritis International Society criteria versus rheumatology expert clinical diagnosis. *Arthritis Care Res (Hoboken)*. 2013 ; 65:1299.
13. Tournadre A, Pereira B, Lhoste A, Dubost JJ, Ristori JM, Claudepierre P, et al. .Differences between women and men with recent-onset axial spondyloarthritis: results from a prospective multicenter French cohort. *Arthritis Care Res.*2013;65:1482–9.
14. Slobodin G, Reyhan I, Avshovich N, Balbir-Gurman A, Boulman N, Elias M, et al. .Recently diagnosed axial spondyloarthritis: gender differences and factors related to delay in diagnosis. *Clin Rheumatol*.2011 ;30:1075–80.
15. van der Horst-Bruinsma IE, Zack DJ, Szumski A, Koenig AS.Female patients with ankylosing spondylitis: analysis of the impact of gender across treatment studies. *Ann Rheum Dis*.2013 ;72(7): 1221–4 .
16. Webers C, Essers I, Ramiro S, et al. .Gender-attributable differences in outcome of ankylosing spondylitis: long-term results from the Outcome in Ankylosing Spondylitis International Study. *Rheumatology (Oxford)*.2016 ;55(3):419–28. 10.1093/rheumatology/kev340.