

Prevalence, Clinical Features, and Radiological Features of Iraqi Patients with Ankylosing Spondylitis

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Abstract

Objective: To estimate prevalence, clinical feature, radiological feature of Iraqi patients with ankylosing spondylitis (AS) and its possible correlation with the disease activity and eye involvement. **Patients and Method:** A cross sectional study was conducted on 318 Iraqi patients with AS diagnosed according to the modified New York criteria. Clinical evaluation (age, gender, symptom of AS, duration of the disease, presence of eye symptoms, family history of AS, clinical assessment scoring of disease activity by bath ankylosing spondylitis disease activity Index (BASDAI) as well as function by Bath ankylosing spondylitis functional index (BASFI) and radiological evaluation (Plain x-ray of sacroiliac joint, pelvic, dorso-lumbar spine and cervical spine as well as magnetic resonance imaging (MRI) for sacroiliac joint and spine were recorded for each patients, and laboratory investigation (complete blood count, erythrocyte sedimentation rate (ESR) C-reactive protein (CRP), and human leucocyte antigen B 27 (HLA-B27) status were tested using the standard serological method. **Results:** The prevalence rate of AS in the sample studied was 0.9%, male was 90.6% with male to female ratio 9:1. The percentage of enthesiopathy was 80.5%, axial arthritis was 68.2% and the peripheral arthritis was 13.8%. HLA-B27 was positive in 55%. Eye involvement was 23.6% and uveitis (all of the patients unilateral) 18.9%. There was significant association between eye manifestation with peripheral arthritis, high function class and severe disease activity but not with the sex, age, disease duration, family history of AS, HLA-B27 positive and extent axial involvement. **Conclusions:** Prevalence of AS in the sample studied was 0.9% with male predominance, enthesiopathy was 80.5%, axial spondylitis 68.2%, peripheral arthritis 13.8%, Eye involvement was 23.6%. HLA-B27 was positive in 55%. There was significant association between eye manifestation with peripheral arthritis, high function class and severe disease activity.

Keywords:-Iraq, Ankylosing spondylitis, Clinical feature, Radiological feature, HLA-B27.

1. Introduction

Ankylosing Spondylitis (AS) is a chronic, progressive inflammatory disease primarily affecting the sacroiliac joint, the axial skeleton, entheses, and less frequently peripheral joints and extra-articular organs such as eye, skin, lung, and cardiovascular system(1,2). Clinical features of AS as well as HLA-B27 can vary from country to country according to genetic and environmental factors (3,4). AS is more common in male, male: female ratio 3:1 (5).

The estimated prevalence of AS in our country was (0.13%), an 84% of Iraqi patients with AS are HLA-B27 positive, while (2.1%) of healthy Iraqi populations are HLA-B27 positive (6,7). It is reported as 0.1% in Netherland (5) and 0.49% in Turkey(8). AS is more common in whites, its prevalence closely parallel to the prevalence of HLA-B27 subtypes those are associated with AS (9,10), Which explain the virtual absence of AS in southern Africa, low rate in Japan, and higher in Norway and very higher in circumpolar arctic and subarctic regions of Eurasia and North America(9). This study was designed to estimate prevalence, clinical feature, radiological feature of Iraqi patients with AS and its association with the disease activity and eye involvement.

2. Patients and Methods

2.1 Study design and sample selection

Across-sectional study was conducted on 318 adult Iraqi patients with AS registered in the Rheumatology Unit, Baghdad Teaching Hospital, Medical City in the period between January 2013 and May 2014. Patients were diagnosed according to the modified New York criteria for AS (10).

Patients with diagnosis of reactive arthritis, psoriatic arthritis, arthritis associated with inflammatory bowel disease, hypertension diabetes mellitus, rheumatoid arthritis, systemic lupus erythematosus, overlap, history of infection or trauma to eye, patients on steroid, and elderly patients were excluded from the study. The study was granted ethical approval from ethics committee of Medical Faculty in Baghdad Teaching Hospital. All patients gave their informed consent prior to enrollment in the study.

2.2 Clinical, laboratory, and radiological evaluation

Questionnaire data of patients included: age, gender, duration of AS, symptoms, family history of AS, evidence of sacroiliitis, spinal involvement, enthesiopathy, peripheral arthritis, chest involvement, cardiac involvement, and eye involvement was checked either symptomatic or not by consultant of ophthalmologist. All

patients were examined by same Rheumatologist for clinical Assessment scoring of disease activity by BASDAI (11) as well as Function by BASFI (12).

HLA-B27 status was determined for each patient using standard serology. Radiological investigations included plain x-ray of both sacroiliac joints , pelvic joints, lumbar spine , dorsal spine and cervical spine as well as MRI of both sacroiliac joint , hips joints and whole spine.

2.3 Statistical analysis

Statistical software (SPSS21) was used for statistical analysis. Categorical data were represented as numbers and percentiles. Difference between categorical variables was measured using Chi square test. P-value < 0.05 was considered statically significant.

3. Results

A total of 318 patients with Iraqi patients with AS were analyzed. Males constituted 90.6% of the sample with a male to female ratio of 9:1. Those younger than 30 years constituted half of the cases, while only 7.5% were older than 40 years, table 1.

Peripheral arthritis was observed in 13.8% of cases (the prevalence rate of this feature in the reference population ranged between 10 to 17.6% with 95% confidence). Hip arthritis was the most frequent peripheral arthritis (6.3%). Eye involvement was observed in 23.6% of cases, with uveitis being the most frequent type (18.9%). Enthesiopathy was identified in 80.5% of cases with achilles tendon being the most affected part (49.1%) followed by plantar fascia (22%). Cardiac involvement was observed in only 1.9% of cases (aortic incompetence and pericardial effusion). Limitation of chest expansion was observed in 68.2% of cases. Only 3.1% of cases reported a positive family history (the 95% confidence interval for this proportion ranged between 1.2% to 5%), table 2.

The highest proportion of cases had functional class-II (84.9%) and only 0.9% had functional class-IV. More than two thirds (68.2%) had a moderate disease activity, with the remaining one third divided between the extreme diseases activity (mild and severe). In addition more than two thirds of cases (68.2%) had the disease affecting the whole spine, while only 5% had the disease limited to sacroiliac and lumbar region, table 3.

Among x-ray positive findings, the most frequently identified feature is sacroiliitis (90.6%) and the least frequent was dorsal kyphosis (54.1%). High grade sacroiliitis was identified in 94.7% of MRI exams and spondylitis was observed in 86.5% of MRI scans. A positive HLA-B27 was elicited in 55% of studied sample, table 4.

As shown in table 5, gender, Age, disease duration, Family history, HLA-B27 and extent of axial involvement had no important or statistically significant association with the probability of having ophthalmic problems. Subjects with peripheral arthritis had a significantly higher rate of eye involvement (36.4%) compared to those with absent peripheral arthritis (21.5%).

In addition those with enthesiopathy had an obviously higher rate of eye involvement (25.4%) compared to those with no enthesiopathy (16.1%), but the observed association failed to reach the level of statistical significance. A higher functional class (III and IV) is associated with a significantly higher rate of eye involvement (35.4%) compared to those with low functional class (21.5%). A severe disease activity is associated with an obviously higher rate of eye involvement (37%) compared to lower disease activities (20.7% and 23.6% for moderate and mild cases), the association however failed short of statistical significance.

As shown in table 6, females had a significantly higher disease activity compared to males. In addition those with peripheral arthritis had a significantly higher disease activity (95.5% of them had a severe form of disease) compared to those with no peripheral arthritis (only 1.5% of them had a severe form). The remaining tested variables had no important association with disease activity

Table 1: Frequency distribution of the study sample by gender and age.

	N	%
Gender		
Female	30	9.4
Male	288	90.6
Total	318	100.0
Age group (years)		
20-29	159	50.0
30-39	135	42.5
40-49	24	7.5
Total	318	100.0

N,number; %,percentile

Table 2: The relative frequency of selected clinical features in the total sample (n=318).

Positive clinical features (n=318)	N	%	95% CI
Peripheral arthritis			
Hip arthritis	20	6.3	
Knee arthritis	10	3.1	
Ankle arthritis	7	2.2	
Shoulder arthritis	7	2.2	
Any peripheral arthritis	44	13.8	(10 - 17.6)
Eye involvement			
Uveitis	60	18.9	
Conjunctivitis	11	3.5	
Dryness	5	1.6	
Any type of ophthalmic affection	75	23.6	(18.9 - 28.3)
Enthesopathy			
Achilles tendon	156	49.1	
Planter fascia	70	22.0	
Chondrocostal	20	6.3	
Iliac crest	10	3.1	
Enthesopathy of any type	256	80.5	(76.1 - 84.9)
Cardiac involvement			
Aortic incompetence	3	0.9	
Pericardial effusion(mild)	3	0.9	
Any type of cardiac involvement	6	1.9	(0.4 - 3.4)
Limitation of chest expansion	217	68.2	(63.1 - 73.3)
Family history of Ankylosing spondylitis	10	3.1	(1.2 - 5)

N, number; %, number; CI, confidence interval

Table 3: Frequency distribution of the study sample by functional class, activity score and extent of axial involvement.

Variables	N	%
Functional class at presentation		
Class-II	270	84.9
Class-III	45	14.2
Class-IV	3	0.9
Total	318	100.0
Activity score at presentation		
Mild	55	17.3
Moderate	217	68.2
Severe	46	14.5
Total	318	100.0
Extent of axial involvement		
Sacroiliac + Lumbar	16	5.0
Sacroiliac, Lumbar and Dorsal	85	26.7
Whole spine (Sacroiliac, Lumbar, Dorsal and Cervical)	217	68.2
Total	318	100.0

None had class-I, N, number; %, number

Table 4: Frequency distribution of the study sample by radiological features and HLA-B27 .

Variables	N	%
X-Ray findings		
Bambo spine	217	68.2
Dorsal kyphosis	172	54.1
Syndesmophytes	267	84.0
Squaring of vertebra	278	87.4
Plain sacroiliatis	288	90.6
Total	318	100.0
MRI		
Low grade sacroiliatis (I-II)	17	5.3
High grade sacroiliatis (III-IV)	301	94.7
Total	318	100.0
Spondylitis identified by MRI	275	86.5
Positive HLA-B27	175	55.0

None had isolated Sacroiliac area affected. MRI, magnetic resonance imaging; HLA, human leukocyte antigen

Table 5: The relative frequency of eye involvement by selected independent variables.

	Total		Eye involvement (any type)		P
	N	N	N	%	
Gender					0.63[NS]
Female	30	6	20.0		
Male	288	69	24.0		
Age group (years)					0.46[NS]
20-29	159	35	22.0		
30-39	135	36	26.7		
40-49	24	4	16.7		
Long disease duration (3+ years)					0.96[NS]
Short (<3)	25	6	24.0		
Long (3+)	293	69	23.5		
Family history of Ankylosing spondylitis					0.12[NS]
Negative	308	75	24.4		
Positive	10	0	0.0		
HLA-B27					0.38[NS]
Negative	143	37	25.9		
Positive	175	38	21.7		
Any peripheral arthritis					0.031
Negative	274	59	21.5		
Positive	44	16	36.4		
Enthesopathy (any type)					0.12[NS]
Negative	62	10	16.1		
Positive	256	65	25.4		
Extent of axial involvement					0.83[NS]
Sacroiliac + Lumbar	16	4	25.0		
Sacroiliac, Lumbar and Dorsal	85	18	21.2		
Whole spine (Sacroiliac, Lumbar, Dorsal and Cervical)	217	53	24.4		
Functional class at presentation					0.036
Class-I to II	270	58	21.5		
Class-III to IV	48	17	35.4		
Score activity at presentation					0.021
Mild to Moderate	272	58	21.3		
Severe	46	17	37.0		

NS, not significant; N, number; %, number, HLAB27, Human leukocyte antigen B27

Table 6: The activity score at presentation by selected independent variables

Variables	Score activity at presentation						Total		P
	Mild		Moderate		Severe		N	%	
	N	%	N	%	N	%	N	%	
Gender									0.008
Female	1	3.3	21	70.0	8	26.7	30	100.0	
Male	54	18.8	196	68.1	38	13.2	288	100.0	
Age group (years)									0.29[NS]
20-29	22	13.8	112	70.4	25	15.7	159	100.0	
30-39	27	20.0	90	66.7	18	13.3	135	100.0	
40-49	6	25.0	15	62.5	3	12.5	24	100.0	
Long disease duration (3+ years)									0.54[NS]
Short (<3)	5	20.0	14	56.0	6	24.0	25	100.0	
Long (3+)	50	17.1	203	69.3	40	13.7	293	100.0	
Family history of Ankylosing spondylitis									0.85[NS]
Negative	55	17.9	207	67.2	46	14.9	308	100.0	
Positive	0	0.0	10	100.0	0	0.0	10	100.0	
HLA-B27									0.69[NS]
Negative	25	17.5	95	66.4	23	16.1	143	100.0	
Positive	30	17.1	122	69.7	23	13.1	175	100.0	
Any peripheral arthritis									<0.001
Negative	55	20.1	215	78.5	4	1.5	274	100.0	
Positive	0	0.0	2	4.5	42	95.5	44	100.0	
Enthesopathy (any type)									0.43[NS]
Negative	10	16.1	47	75.8	5	8.1	62	100.0	
Positive	45	17.6	170	66.4	41	16.0	256	100.0	
Extent of axial involvement									0.24[NS]
Sacroiliac + Lumbar	4	25.0	9	56.3	3	18.8	16	100.0	
Sacroiliac, Lumbar and Dorsal	8	9.4	64	75.3	13	15.3	85	100.0	
Whole spine (Sacroiliac, Lumbar, Dorsal and Cervical)	43	19.8	144	66.4	30	13.8	217	100.0	

4. Discussion

To the best of our knowledge this study is the first in discussing the clinical , radiological features of AS in Iraq and its association with disease activity score as well as the eye involvement , and the 2nd study in discussing HLA –B 27 in Iraqi patients with AS.

A total of 318 Iraqi patients with AS were analyzed. The prevalence rate for recorded cases is 0.9 per 100000. Males were constituted 90.6% of the sample studied with a male to female ratio is 9:1.

This study was similar to the Mexican (13) and Indians(14) studied, but higher than that reported in Turkish and Iran in which their male predominance was (61.4 %)and (71.4%) with a sex ratio of(1.6:1) and (3:1) respectively (11,12) , this may be explained by ethnic groups , environmental factor , genetic , number of patients and disease duration .

Peripheral arthritis was observed in 13.8% of cases and the hip arthritis was the most frequent peripheral arthritis 6.3% and our results disagreement with others studied like Eskimos (15) result which included peripheral involvement very frequent and the difference attributed to genetic factors, environmental factors, number of cases , gender as well as disease duration. Enthesiopathy was observed in 80.5% of cases with Achilles tendon being the most affected part 49.1% followed by plantar fascia (22%) and this result is similar to that of India studied (16) .

Eye involvement was observed in 23.6% of cases with unilateral uveitis being the most frequent type 18.9% and this findings is lower than India findings (16) which was 26% . Only 3.1% of cases reported had positive family of AS and the result is lower than Iranian studied (12) which was 14.3% might due to genetic factor , number of patients and disease duration .

A positive HLA-B27 was elicited in 55% of studied sample which was higher than that of Kuwait(9) which showed only 25.7% positivity and lower than previous studied done in Iraqi by Al-Rawi et al and the result was 84% (7) and the explanation might due to the difference in number of patients and disease duration.

Two thirds of the cases 68.2% had the disease affecting the whole spine while only 5% had the disease the disease limited to sacroiliac and lumbar region with high grade of sacroiliac involvement was identified 94.7% of MRI findings and spondylitis was observed in 86.5 % of MRI findings this explained due to delay diagnosis because of the following factors plain x-ray of sacroiliac joints are normal in early disease ,disease is common in the male and the male has good tolerability for pain ,female patient has underestimated ,no specific clinical features as well as laboratory test for diagnosis AS ,wrong diagnosis by non –rheumatologist and HLA-B27 might be negative in some case.

Gender, age, disease duration, family history of AS, HLA-B27 and extent of axial involvement had no important or statistically significant association with the probability of having ophthalmic problem. This results showed patients with peripheral arthritis had high rate of eye involvement 36.4% compared to those with absent of peripheral arthritis 21.5%,high function class 3 and 4 associated with high rate of eye involvement 35.4% compared to those with low functional class 21.5%, and severe disease activity is associated with an obviously high rate of eye involvement 37% compared to low –moderate disease activity 21.3% and observed association have statistical significant ,this study was nearly similar to other studied of eye involvement (17).

Patients with enthesiopathy had obviously high rate of eye involvement 25.4% compared to those with no enthesiopathy 16% but the observed association failed to reach the statistical significant. Female has higher rate of disease activity with statistical significant(26.7% of them had severe form of disease) compared to male (only 13.2% of them had severe form of disease).Patients have peripheral arthritis significantly high rate of disease activity (95.5% of them had severe form of disease) compared to those without peripheral arthritis(only 1.5% of them had severe form),and the remaining tested variables had no important association with disease activity .

Cardiac involvement of cases in this study include 0.9% Aortic incompetence and 0.9% mild pericardial effusion and this result lower rate than another (18) which showed that the cardiac involvement 54%. The explanation might due to following reasons number of cases, disease duration, genetic, environmental factors and Doppler echocardiography (18). This study showed neither renal involvement nor neurological involvement

5. Conclusion

The prevalence rate of AS in the sample studied was 0.9 % , male was 90.6% with male to female ratio 9:1.The percentage of enthesiopathy was 80.5% ,whole spine (axial) was 68.2% and the peripheral arthritis was 13.8% .HLA-B27 was positive in 55%.Eye involvement was 23.6% and uveitis (all of the patients unilateral) 18.9% . There was significant correlation between eye manifestation with peripheral arthritis, high function class and severe disease activity but not with the sex, age, disease duration, family history of ankylosing spondylitis, HLA-B27 positive and extent axial involvement.

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References

1. Khan MA. Spondyloarthropathies. *Rheum Dis Clin North Am* 1992; 18(1):1-279.
2. Gouveia EB, Elmann D, Morales MS.. Ankylosing spondylitis and uveitis: overview. *Rev Bras Reumatol* 2012;52(5):742-756.
3. Gran JT, Husby G. The epidemiology of ankylosing spondylitis . *Semin Arthritis Rheum.* 1993;22:319-34.
4. Lau CS , Burgos-Vargas R,Louthrenoo W , et al. Features of spondylo arthritis around the world .*Rheum Dis Clin North Am.*1998;24:753-70.
5. El Maghraoui A, Extra-articular manifestation of ankylosing spondylitis: Prevalence, characteristic and therapeutic implication, *Eur J Int Med* (2011), doi:10.1016/j.ejim.2011.06.006.
6. Abdelrahman MH, Mahdy S, Khanjar IA,et al . Prevalence of HLA-B27 in patient with ankylosing spondylitis in Qatar .*Int J Rheumatol* 2012;8(6):213-6.
7. Al-Rawi ZS ,Al-Shakarchi HA ,Hassan F,et al .Ankylosing spondylitis and its association with the histocompatibility antigen HLA-B27 :an epidemiological and clinical study .*Rheumatol Rehabil* 1978;17(2):72-5.
8. Ahmet Inanir, Serbulent Yigit, Mustafa Akif sariyildiz et al. Outcome of Turkish Ankylosing Spondylitis Patients . *Eur J Gen Med* 2013; 10(3):145-149.

9. Tyrrell PNM, Davies AM, Evans N: Neurological disturbances in ankylosing spondylitis, *Ann Rheum Dis* 53:714–717, 1994.
10. Van der Linden SM , Valkenburg HA ,Cats A .Evaluation of the diagnostic criteria for ankylosing spondylitis :a proposal for modification of the New York criteria . *Arthritis Rheum* 1984 ;27:361 -368
11. Gunal EK , Sarvan FO, Kamali S, et al .Low frequency of HLA-B27 in ankylosing spondylitis patients from Turkey . *Jt Bone Spine* .2008;75:299-302.
12. Mohammad AN, Fariborz G,Hamid RH,Zahra H. Pattern of ankylosing spondilitis in an Iranian population of 98 patients . *Mod Rheumatol* 2009;19:309-315.Gabriel SE, Michaud K. Epidemiological studies in incidence, prevalence, mortality, and comorbidity of the rheumatic diseases. *Arthritis Res Ther* 2009;11:229.
13. Burqos-Vargas R, Naranjo A , Castillo J, Katona G , Ankylosing spondylitis in the Mexican mestizo :- Patterns of disease according to age at onset . *J Rheumatol* 1989;16:186-91.
14. Prakash S , Mehra NK , Bhargalla S, et al .Ankylosing spondylitis in North India : aclinical and immunogenetic study. *Ann Rheum Dis* 1984;43:381-5.
15. Boyer GS, Templin DW, Bowler A, Lawrence RC, et al. Spondyloarthropathy in the community :clinical syndromes and disease manifestation in Alaskan Eskimo populations . *J Rheumatol* .1999;26:1537-44.
16. Rohit Aggarwal , Anand N, Malaviya. Clinical characteristics of patients with ankylosing spondylitis in India . *Clinical Rheumatol* 2009 (28):1199-1205.
17. Zeboulon N, Dougados M, Gossec L. Prevalence and characteristics of uveitis in the spondyloarthropathies :a systemic literature review .*Ann Rheum Dis* 2008;67:955-9.
18. De Almedia FA,Albanesi Filho FM, De Albuquerque EM, et al. Echocardiography in seronegative spondylo-arthropathies *Medicina (B Aires)* 1995;55:231-6.

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