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HLA-B27 positivity and associated factors in spondyloarthritis patients from Turkiye: a single-center study

Zehra Özsoy[1], Yelda Öztürk[2], Zeynep Öztürk[1], Esin Beyan[3]

[1]*Department of Rheumatology, Ankara Atatürk Sanatorium Training and Research Hospital, University of Health Sciences, Ankara, Turkiye*
[2]*Department of Family Medicine, Ankara Atatürk Sanatorium Training and Research Hospital, University of Health Sciences, Ankara, Turkiye*
[3]*Department of Internal Medicine, Ankara Atatürk Sanatorium Training and Research Hospital, University of Health Sciences, Ankara, Turkiye*

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ABSTRACT

Aims: Spondyloarthropathies (SpA) constitute a category of multisystemic inflammatory seronegative arthritis. A genetic correlation exists between SpA and the human leukocyte antigen (HLA)-B27 gene. HLA-B27 positive is observed in roughly 90% of patients with ankylosing spondylitis. This study seeks to ascertain the prevalence of HLA-B27 positivity and its associated factors in SpA patients within the Turkish population, while also comparing the demographic, clinical, and radiological characteristics between HLA-B27 positive and negative groups, their utilization of bDMARDs, and the baseline and post-treatment disease activity metrics.

Methods: The study comprised 300 patients having accessible HLA-B27 findings. SpA patients were classified into two groups according to their HLA-B27 status: positive and negative. Demographic parameters, HLA-B27 results, disease activity scores, and the existence of radiographic abnormalities were documented in both groups.

Results: Of the 300 patients involved in the study, 224 (74.7%) tested positive for HLA-B27. The median age of all patients was 45 years, with HLA-B27 positive individuals being younger. The median age for symptom start was 35 years, while the median age for diagnosis was 39 years. Analysis of the radiographic features based on ASAS criteria indicated that the radiographic axial SpA group comprised the largest proportion of patients at 69.2%, followed by non-radiographic axial SpA at 23.4%, and peripheral SpA at 7.4%. Upon comparison of the two groups, the seropositive cohort exhibited a markedly elevated prevalence of familial history. Hypertension was the predominant comorbidity in both the HLA-B27 positive and negative cohorts. The prevalence of smokers was markedly greater in the HLA-B27 positive cohort. The frequencies of radiographic sacroiliitis, syndesmophytes, bamboo spine, and hip involvement were elevated in the positive group when compared. Uveitis exhibited greater prevalence in the positive cohort. Upon comparison of the two groups, the post-treatment reductions in BASDAI, BASFI, VAS Pain, ESR, and CRP levels were more pronounced in the positive group than in the negative group. In comparing the HLA-B27 positive and negative cohorts, no significant disparities were observed in the frequency of single or multiple treatment modifications. Nevertheless, the alteration of bDMARD treatment was less common in the HLA-B27 positive cohort than in the negative cohort.

Conclusion: HLA-B27-positive patients were younger, mostly male, experienced an earlier onset of disease, and demonstrated a more active disease progression. The treatment response was superior in the positive group relative to the negative group.

Keywords: HLA-B27, spondyloarthropathies, seropositive, seronegative

INTRODUCTION

Spondyloarthropathies (SpA) constitute a category of multisystemic inflammatory seronegative arthritis marked by inflammation of the vertebrae, peripheral joints, and periarticular tissues. The SpA group comprises ankylosing spondylitis (AS), reactive arthritis, psoriatic arthritis, and enteropathic arthritis.[1] A genetic correlation exists between SpA and the human leukocyte antigen (HLA)-B27 gene. HLA-B27 is a molecule encoded at the B locus of the major histocompatibility complex located on the short arm of chromosome 6. HLA-B27 positive is identified in around 90% of patients with AS.[2] The prevalence of HLA-B27 positive differs by race and ethnicity. HLA-B27 positive is observed in 90–95% of patients with AS in Northern European countries, with the highest prevalence documented among Native Americans.[3] A research in Turkey identified HLA-B27 positive in 70% of patients with AS.[4] The pathophysiology of AS and the precise function of HLA-B27 in disease progression remain inadequately elucidated.[5] Evidence indicates that HLA-B27 positive in AS patients may correlate with early illness onset, prompt diagnosis, familial predisposition, heightened

Corresponding Author: Zehra Özsoy, dr.zehraduman@hotmail.com

incidence of acute anterior uveitis, increased frequency of advanced-stage sacroiliitis, prolonged disease duration, and accelerated disease progression.[6]

This study seeks to ascertain the prevalence of HLA-B27 positivity and its associated factors in SpA patients within the Turkish population, while also comparing the demographic, clinical, and radiological characteristics of HLA-B27 positive and negative groups, their utilization of bDMARDs, and the baseline and post-treatment disease activity parameters.

METHODS

Ethics

Our study adhered to the 2013 modification of the Helsinki Declaration, and ethical approval was obtained from the Institutional Review Board of Health Sciences University Ankara Atatürk Sanatorium Training and Research Hospital (Date: 11.12.2024, Decision No: 2024-BÇEK/180).

Patient Selection

From December 1, 2023, to November 1, 2024, the records of SpA patients scheduled to receive or currently undergoing bDMARD medication were examined in the automation system. The study comprised 300 biologically naive participants with accessible HLA-B27 findings. This study was a single-center, retrospective, descriptive analysis. According to ASAS criteria, the SpA patient cohort was composed of individuals diagnosed with radiographic axial SpA (rAxSpA), non-radiographic axial SpA (nrAxSpA), and peripheral SpA (pSpA).

Study Parameters

The SpA patients involved in the study were classified into two groups according to their HLA-B27 status: positive and negative. The following variables were recorded in both groups: demographic characteristics, age at diagnosis, age at symptom onset, diagnostic delay, disease duration, family history of rheumatologic diseases, comorbidities, smoking status, peripheral joint involvement, extra-articular manifestations, HLA-B27 results, baseline (when the first biological treatment was started) and post-treatment (on the date of last biological treatment) erythrocyte sedimentation rate (ESR), C-reactive protein (CRP) levels, and disease activity scores (BASDAI: Bath Ankylosing Spondylitis Disease Activity Index, BASFI: Bath Ankylosing Spondylitis Functional Index, VAS: Visual Analogue Scale, VAS Pain, VAS Fatigue, VAS Global), as well as the number of bDMARD switches during follow-up. Furthermore, the presence of radiographic sacroiliitis, syndesmophytes in the lumbar, thoracic, and cervical vertebrae, bamboo spine, hip involvement, and sacroiliitis findings on magnetic resonance imaging (MRI) were documented. The prevalence and distribution of radiographic axial spondyloarthritis, non-radiographic axial spondyloarthritis, and peripheral spondyloarthritis were examined in accordance with ASAS criteria.

Statistical Analysis

The data analysis was conducted utilizing SPSS Statistics for Windows, Version 23.0 (IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp). The adherence of numerical variables to a normal distribution was assessed using both visual approaches (histograms and probability plots) and analytical techniques (Kolmogorov-Smirnov and Shapiro-Wilk tests). Continuous variables were represented as mean±SD in descriptive analyses, while categorical variables were represented as frequencies and percentages. In independent groups, categorical data and rates were compared using eligibility criteria, employing Chi-square or Fisher testing. The independent samples t-test analyzed the means of two independent groups for normally distributed variables. p values less than 0.05 were deemed statistically significant. The Mann-Whitney U test was employed to compare the medians of non-normally distributed data from separate groups. $p<0.05$ was deemed statistically significant.

RESULTS

Demographic Attributes and Axial, Articular, and Extra-Articular Observations of SpA

Of the 300 patients participating in the study, 224 (74.7%) tested positive for HLA-B27. Among the patients, 155 (51.7%) were male, with females predominating in the HLA-B27 negative group, while men predominated in the positive group [125 (55.8%) vs. 30 (39.5%), p=0.01]. The median age of all patients was 45 years (range 20–68), with HLA-B27 positive patients being younger [44 years (range 20–59) compared to 46 years (range 27–68), p=0.01]. The median age at symptom onset was 35 (10–49) years, the median age at diagnosis was 39 (19–53) years, the median diagnostic delay was 4 (0–21) years, and the median disease duration was 5 (0–20) years. The median (min-max) duration of biological treatment is 10 (6-11) months. The median (min-max) age at symptom onset was significantly younger in the positive group, with values of 34.5 (10–47) compared to 36 (16–49), p=0.03. Similarly, the median (min-max) age at diagnosis was also significantly younger in the positive group, recorded at 38.5 (19–53) against 41 (20–53), p=0.01. The median (min-max) diagnostic delay [4 (0–21) years vs. 4 (0–18) years, p=0.68] and median (min-max) illness duration [5 (0–19) years vs. 6 (0–20) years, p=0.5] were comparable between the groups.

Analysis of the radiographic features based on ASAS criteria indicated that the radiographic axial SpA group comprised the largest proportion of patients at 69.2%, followed by non-radiographic axial SpA at 23.4%, and peripheral SpA at 7.4%. A comparison between the HLA-B27 positive and negative cohorts indicated that radiographic axial SpA and peripheral SpA were markedly more prevalent in the positive cohort, while non-radiographic axial SpA was more common in the negative cohort (**Table 1**).

An assessment of the radiographic findings from the sacroiliac, hip, lumbar, thoracic, and cervical radiographs, together with sacroiliac MRI results, indicated that 69.3% of patients exhibited radiographic sacroiliitis, whereas 91.7% demonstrated sacroiliitis on MRI. **Table 1** presents the percentages of individuals exhibiting radiographic syndesmophytes, bamboo spine, hip involvement, and peripheral arthritis. The HLA-B27 positive group exhibited substantially higher rates of radiographic syndesmophyte, bamboo spine, hip involvement, and radiographic sacroiliitis

Table 1. Comparison of radiographic findings between HLA-B27 negative and positive groups

		HLA-B27			
		All patients n (%) 300 (100)	**Positive n (%) 224 (74.7)**	**Negative n (%) 76 (25.3)**	**p value**
SpA disease groups (according to ASAS)	Radiographic axial SpA, n (%)	208 (69.3)	163 (72.8)	45 (59.2)	0.02
	Non-radiographic axial SpA, n (%)	70 (23.3)	39 (17.4)	31 (40.8)	0.000
	Peripheral Spa, n (%)	22 (7.3)	22 (9.8)	0 (0)	0.005
Radiographic sacroiliitis, n (%)		208 (69.3)	163 (72.8)	45 (59.2)	0.02
Sacroiliitis on MRI, n (%)		275 (91.7)	202 (90.2)	73 (96.1)	0.1
Radiographic syndesmophyte, n (%)		72 (24)	60 (26.8)	12 (15.8)	0.05
Radiographic bamboo spine, n (%)		17 (5.7)	16 (7.1)	1 (1.3)	0.05
Radiographic hip involvement, n (%)		29 (9.7)	27 (12.1)	2 (2.6)	0.01
Peripheral arthritis, n (%)		88 (29.3)	73 (32.6)	15 (19.7)	0.03

SpA: Spondyloarthropathies, MRI: Magnetic resonance imaging, HLA-B27: Human leukocyte antigen B27

positivity when compared to the other groups. No substantial variation was noted in the incidence of sacroiliitis on MRI between the two cohorts (Table 1).

Concerning articular and extra-articular manifestations, uveitis was identified in 57 (19%) patients, psoriasis in 77 (25.7%), inflammatory bowel disease in 19 (6.3%), dactylitis in 15 (5%), and enthesitis in 69 (23%). A comparative analysis revealed that uveitis was significantly more prevalent in the positive group [49 (21.9%) vs. 8 (10.5%), p=0.02], while no significant differences were observed in the prevalence of psoriasis [60 (26.8%) vs. 17 (22.4%), p=0.44], inflammatory bowel disease [16 (7.1%) vs. 3 (3.9%), p=0.32], dactylitis [12 (5.4%) vs. 3 (3.9%), p=0.62], and enthesitis [54 (24.1%) vs. 15 (19.7%), p=0.43].

SpA Familial History and HLA-B27

In the family history of 122 patients (40.7%), there was a documented history of rheumatologic disease. Upon comparison of the two groups, the seropositive cohort exhibited a markedly elevated prevalence of familial history [99 (44.2%) vs. 23 (30.3%), p=0.03].

Comorbid Conditions

No significant differences in comorbidities were observed between the HLA-B27 positive and negative groups for asthma/COPD [40 (17.9%) vs. 9 (11.8%), p=0.22], hyperlipidemia [36 (16.1%) vs. 15 (19.7%), p=0.46], cardiovascular disease [32 (14.3%) vs. 10 (13.2%), p=0.8], or chronic kidney disease [14 (6.3%) vs. 3 (3.9%), p=0.45]. The positive group had a considerably greater prevalence of hypertension [78 (34.8%) vs. 16 (21.1%), p=0.02] and diabetes [46 (20.5%) vs. 6 (7.9%), p=0.01]. Hypertension was the predominant comorbidity in both the HLA-B27 positive and negative cohorts. The prevalence of smokers was markedly greater in the HLA-B27 positive cohort [74 (33%) compared to 14 (18.4%), p=0.01].

Baseline and Post-Treatment Disease Activity and Function with Biologic Disease-Modifying Antirheumatic Drugs (bDMARDs)

Table 2 summarizes the mean baseline and post-treatment disease activity levels (BASDAI, BASFI, VAS Global, VAS Fatigue, VAS Pain) along with the mean ESR and CRP data for all patients. Upon comparison of baseline disease activity between groups, the HLA-B27 positive cohort exhibited elevated BASDAI, BASFI, VAS Pain, and VAS Fatigue scores, whereas no significant difference was observed in VAS Global ratings. The baseline levels of ESR and CRP were elevated in the HLA-B27 positive cohort. Upon comparison of post-treatment disease activity metrics between groups, BASDAI, BASFI, and VAS Pain scores were markedly elevated in the HLA-B27 negative cohort. Nonetheless, disease activity metrics diminished in both cohorts following treatment. Upon comparison of the two groups, the post-treatment reductions in BASDAI, BASFI, VAS Pain, ESR, and CRP levels were more pronounced in the positive group than in the negative group (Table 2).

bDMARD Therapeutics and Results

Upon evaluating all SpA patients about their bDMARD selections throughout follow-up, Adalimumab emerged as the most commonly preferred drug, accounting for 111 individuals (37%). Subsequently, Certolizumab accounted for 84 cases (28%), Etanercept for 79 cases (26.3%), Golimumab for 43 cases (14.3%), Secukinumab for 38 cases (12.7%), and Infliximab for 15 cases (5%). In a cohort of HLA-B27+patients, Adalimumab was administered to 85 individuals (37.9%), Etanercept to 66 (29.5%), Certolizumab to 65 (29%), Secukinumab to 16 (21.1%), Golimumab to 33 (14.7%), and Infliximab to 12 (5.4%). Among HLA-B27 negative individuals, Adalimumab was selected by 26 (34.2%), Etanercept by 66 (29.5%), Certolizumab by 19 (25%), Golimumab by 10 (13.2%), Secukinumab by 22 (9.8%), and Infliximab by 12 (5.4%) people. In the comparison of groups, Secukinumab was more commonly favored in the negative group [16 (21.1%) vs. 22 (9.8%), p=0.01]. No statistically significant differences were seen between the two groups regarding additional bDMARDs.

In the assessment of bDMARD therapy alterations, 248 (82.7%) patients maintained their treatment, 34 (11.3%) underwent one treatment modification, and 18 (6%) experienced several treatment modifications. No significant differences were seen between the HLA-B27 positive and negative groups regarding the rate of single treatment modifications [27 (12.1%) vs. 7 (9.2%), p=0.49] or multiple treatment changes [16 (7.1%) vs. 2 (2.6%), p=0.15]. Nonetheless, the alteration of bDMARD

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Table 2. Comparison of change of disease activity parameters after treatment between HLA-B27 negative and positive groups

		HLA-B27			
		All patients	**Positive**	**Negative**	**p value**
Baseline sedimentation, mm/h		20 (2-110)	20.5 (2-110)	19 (2-60)	0.03
Baseline CRP, mg/dl		17 (1-76.9)	17.7 (1-75.1)	10.9 (1-76)	0.000
Recent Sedimentation, mm/h		4 (1-66)	4 (1-66)	5 (1-26)	0.02
Recent CRP, mg/dl		4 (0.9-25)	5 (0.9-25)	2 (1-20)	0.000
Baseline disease activity	BASDAI, (0-10)	7.5 (4.5-9.8)	7.5 (5-9.8)	7.2 (4.5-9.2)	0.02
	BASFI, (0-10)	7.5 (4.5-9.8)	7.7 (4.5-9.8)	7.2 (5.4-9.8)	0.05
	VAS global, (0-100)	76 (45-100)	77 (45-99)	75 (45-100)	0.88
	VAS pain, (0-100)	81 (45-100)	82.5 (45-100)	75 (45-98)	0.01
	VAS fatigue, (0-100)	65 (20-96)	66 (20-96)	62 (30-95)	0.01
After treatment disease activity	BASDAI, (0-10)	3.8 (2.2-6.5)	3.7 (2.2-5.8)	4 (2.5-6.5)	0.003
	BASFI, (0-10)	3.7 (1-7.9)	3.5 (1-7.9)	4.3 (1-7.8)	0.05
	VAS global, (0-100)	35 (5-89)	35 (8-89)	35 (5-75)	0.19
	VAS pain, (0-100)	45 (10-90)	45 (10-90)	54 (30-88)	0.02
	VAS fatigue, (0-100)	35 (5-80)	35 (5-80)	25.5 (5-78)	0.01
BASDAI change		-34 (-71.-6)	-37 (-71.-9)	-29 (-57.-6)	0.000
BASFI change		-33 (-80.-10)	-35 (-80.-10)	-30 (-60.-12)	0.000
VAS global change		-32 (-86.2)	-30 (-86.2)	-37 (-80.-9)	0.03
VAS pain change		-25 (-78.-5)	-27 (-78.-5)	-20 (-41.-5)	0.000
VAS fatigue change		-25 (-90.10)	-25 (-90.10)	-26 (-85.-5)	0.94
CRP change, mg/dl		-11 (-75.9)	-12 (-70. 9)	-6 (-75.1)	0.001
Sedimentation change, mm/h		-14 (-94.1)	-16.5 (-94.1)	-11 (-51.-1)	0.002

HLA-B27: Human leukocyte antigen B27, CRP: C-reactive protein, BASDAI: Bath Ankylosing Spondylitis Disease Activity Index, BASFI: Bath Ankylosing Spondylitis Functional Index, VAS: Visual Analogue Scale. All values are given as median (minimum-maximum).

treatment was less common in the HLA-B27 positive cohort compared to the negative cohort [181 (80.8%) vs. 67 (88.2%), p=0.14].

DISCUSSION

74.7% of the patients in our study were identified as HLA-B27 positive. Patients who tested positive for HLA-B27 were younger, and there was a notable male predominance in this cohort. This group exhibited an earlier start of symptoms and diagnosis, although the diagnostic delay was comparable across the groups. Upon comparison of the rates of radiographic sacroiliitis, syndesmophytes, bamboo spine, and hip involvement, the positive group exhibited a higher prevalence of these conditions. However, no distinction was observed between the two groups in terms of the frequency of MRI-detected sacroiliitis. Radiographic axial spondyloarthritis and peripheral spondyloarthritis were more prevalent in the positive group, while non-radiographic axial spondyloarthritis was more common in the negative group. Uveitis was more common in the positive group, however no differences were observed between the groups regarding psoriasis, inflammatory bowel disease, dactylitis, or enthesitis. There was a family history of rheumatologic disease in 40.7% of the patients, with a higher prevalence in the positive group. Moreover, diabetes, hypertension, and smoking were more prevalent in the positive group. Upon comparison of the two groups, the mean baseline values of BASDAI, BASFI, VAS Fatigue, VAS Pain, ESR, and CRP were elevated in the positive group relative to the negative group. Nonetheless, the post-treatment decrease in BASDAI, BASFI, VAS Pain, ESR, and CRP values was more pronounced in the positive group. No significant differences were seen in bDMARD treatment adjustments between HLA-B27 positive and negative groups concerning single or multiple medication alterations. Nevertheless, there were fewer therapy adjustments in the HLA-B27 positive cohort than in the negative cohort.

Despite the fact that the mechanism of HLA-B27 positivity in the pathogenesis of SpA is not completely understood, genetic predisposition is a well-established fact. In the journal Nature on March 9, 1973, Caffrey and James[7] first demonstrated the significant association between AS and HLA-B27. Schlosstein[8] subsequently corroborated this assertion. In addition, HLA-B27 has been identified as being associated with SpA in forms other than AS. It has been noted that homozygous individuals who are positive for HLA-B27 have a greater susceptibility to AS than heterozygous individuals. In Finland, this rate was 11%, whereas in Korea, it was 29.8%, compared to 0.87%.[9] The degree of HLA-B27 positivity is contingent upon one's ethnicity and race. Günal[4] and Alamanos[10] experienced lower positivity rates than other populations in an HLA-B27 analysis of Greek and Turkish populations, which are geographically similar. Our study established the HLA-B27 positive rate at 74.7%.

Although it is believed that AS is 2 to 5 times more prevalent in men, recent research suggests that the male-to-female ratio has been declining.[11] In two studies that focused on patients with predominantly HLA-B27-negative AS[12] and those that

included the full range of axial SpA[13], it was discovered that HLA-B27-positive patients were more likely to be male than their negative counterparts. In contrast, three additional investigations failed to detect any distinction.[10,14,15] Male dominance was observed among HLA-B27-positive patients in our investigation.

According to Feldtkeller et al.[11], the average age of AS onset was 25.1±8.5 years. This was reported as 23.5±8.9 years in a population-based study conducted in Turkey.[4] The literature presents contradictory findings concerning the age of disease onset in HLA-B27-positive versus negative patients. The tiny sample sizes of the studies can be a contributing factor to the inconsistencies.[16] In a comprehensive study that included 1080 AS patients, it was noted that HLA-B27-positive patients exhibited disease onset an average of three years earlier than their negative counterparts.[11] In contrast to a large study conducted in China that did not disclose a difference[12], subsequent studies have demonstrated a 5 to 9-year difference in the age at which the disease onset occurred between the two patient groups.[9,15] In a prospective, multicenter French cohort (DESIR) that included 708 patients with early axial SpA, HLA-B27-positive patients exhibited a younger disease onset.[13] In this SpA cohort, patients who were HLA-B27-positive experienced a shorter diagnostic delay than those who were negative. HLA-B27-negative AS patients are diagnosed at a later stage and experience prolonged diagnostic delays, as indicated by a multitude of studies in the literature.[5,11,13] HLA-B27-positive patients exhibited a younger age at symptom onset and diagnosis in our study, while the diagnostic delay periods were comparable.

Khan[16] conducted the initial comparison of the clinical characteristics of AS patients who were HLA-B27-positive and those who were negative in 1977. Consequently, numerous studies have assessed the prevalence of musculoskeletal manifestations of AS, such as hip arthritis, enthesitis, dactylitis, and peripheral arthritis. The majority of studies have emphasized that HLA-B27-positive AS patients have a substantially higher prevalence of these features than their negative counterparts. However, two studies did not find a significant difference.[14,17] It is widely acknowledged that hip arthritis is a reliable indicator of severe disease in AS.[18] In the positive group of our cohort, hip involvement was more prevalent. The literature has not generally shown a significant relationship between the occurrence of peripheral arthritis and HLA-B27 status, in contrast to our study.[6] In the DESIR cohort[13] and a Brazilian AS cohort[14], a substantially higher prevalence of enthesitis was observed in HLA-B27-positive AS patients; however, this finding was not reported in other studies.[9,12,15] There was no distinction in the frequency of enthesitis between the two groups in our investigation. Consistent with our research, two studies that documented dactylitis prevalence found no significant difference between HLA-B27-positive and negative AS patients.[12,13]

The prevalence of uveitis in our sample was markedly elevated in the HLA-B27-positive group, corroborating findings in the literature.[19,20] The initial report indicating that acute anterior uveitis is more prevalent in HLA-B27-positive AS patients compared to their negative counterparts was published in 1977.[16] HLA-B27-associated uveitis is alarming due to its high incidence, effect on relatively young individuals, frequently recurring inflammatory episodes, and potential for vision-threatening ocular consequences.[21] Acute anterior uveitis is the predominant kind, comprising almost 90% of all instances. Fifty percent of all acute anterior uveitis cases are positive for HLA-B27. About 50% of patients with HLA-B27-positive acute anterior uveitis acquire SpA during follow-up, whereas approximately 25% of those diagnosed with SpA suffer acute anterior uveitis.[22]

Research demonstrates that HLA-B27 is a significant genetic marker for psoriatic arthritis (PsA); nevertheless, the elevated prevalence of HLA-B27 among PsA patients (<20%) does not extend to psoriasis. Individuals with psoriasis demonstrate a prevalence of HLA-B27 positive comparable to that of the healthy population (4.5% versus 7.2%). Literature indicates a marginally reduced HLA-B27 prevalence in people with concurrent psoriasis compared to those without (80% vs. 90.5%).[23] Likewise, a separate study involving patients with AS[16] and another encompassing the entire axial SpA spectrum indicated a greater frequency of psoriasis among HLA-B27-negative patients.[13] Our investigation revealed no significant difference in psoriasis prevalence between the HLA-B27-positive and negative groups.

The prevalence of HLA-B27 in IBD patients has not risen relative to the general population.[24] Numerous research have indicated that IBD is more commonly found in HLA-B27-negative individuals. The incidence of IBD is approximated at 1% among HLA-B27-positive AS patients and 9% among HLA-B27-negative individuals.[14] A comprehensive assessment of 908 HLA-B27-positive and 90 HLA-B27-negative patients indicated IBD prevalences of 9% and 20%, respectively ($p<0.001$).[17] among the DESIR cohort examining early axial spondyloarthritis patients, a markedly elevated frequency of inflammatory bowel disease was seen among HLA-B27-negative individuals.[13] Our analysis revealed no significant difference in IBD prevalence between the HLA-B27-positive and negative groups.

In the axial SpA DESIR cohort, inflammatory and structural lesions in the spine or sacroiliac joints, identified using radiography and MRI, were more common in HLA-B27-positive individuals than in those who were negative.[13] A cross-sectional study in Belgium with 619 AS patients indicated a trend of increased HLA-B27 positive among those with spinal syndesmophytes (89%) and complete ankylosis (87%).[25] Conversely, a separate cross-sectional investigation of 398 patients identified no correlation between HLA-B27 positive and radiographic severity.[26] Our investigation revealed that the prevalence of radiographic sacroiliitis, syndesmophytes, and bamboo spine was greater in the HLA-B27-positive cohort.

The incidence of familial AS is elevated among persons possessing the HLA-B27 allele. Zhang et al.[27] conducted a study revealing that a family history was more prevalent among HLA-B27-positive people. Approximately 20% of HLA-B27-positive relatives of AS patients are reported to develop the condition, but only 1.3% of HLA-B27-positive persons in the general population have been diagnosed with the disease.[28] In

our study, 40.7% of HLA-B27-positive individuals exhibited a familial history of rheumatologic disease.

Although there is a prevalent belief that HLA-B27 correlates with disease severity in AS, its influence on structural development in the spine or sacroiliac joints remains unproven. Published cohort studies have indicated comparable BASDAI[29] and BASFI[9,15,29] scores in both HLA-B27-positive and negative individuals. The DESIR cohort indicated marginally inferior BASDAI and BASFI scores in the HLA-B27-negative patient demographic.[13] Our investigation revealed that, at baseline, disease activity indicators such as BASDAI, BASFI, VAS Fatigue, VAS Pain, ESR, and CRP levels were elevated in HLA-B27-positive patients compared to their negative counterparts. Post-treatment, the disease activity indicators, together with the mean ESR and CRP values, diminished in both cohorts. In the comparison of the two groups, the post-treatment decrease in BASDAI, BASFI, VAS Pain, ESR, and CRP values was more pronounced in the positive group than in the negative group.

No substantial difference was observed between single and multiple medication changes when comparing HLA-B27-positive and negative groups in our cohort for b-DMARD therapy modifications. A greater number of HLA-B27-positive individuals necessitated fewer modifications to b-DMARD treatment than the negative group. Two studies examining the impact of HLA-B27 on disease activity and treatment response in AS patients concluded that HLA-B27 status, whether positive or negative, did not affect treatment regimen decisions or alterations.[1,30] Treatment selection in clinical practice is determined by the patient's clinical presentation. The primary drawback of our study is its single-center, retrospective design.

CONCLUSION

In conclusion, HLA-B27 positive in the Turkish population was observed to be lower than in other ethnic groups. Patients who tested positive for HLA-B27 were younger, mostly male, experienced an earlier onset of disease, and demonstrated a more active disease progression. The treatment response was superior in the positive group relative to the negative group. Due to the strong correlation between HLA-B27 positive and uveitis, this aspect should be taken into account while formulating treatment plans. Moreover, the heightened incidence of rheumatologic disorders among the relatives of HLA-B27-positive individuals warrants attention.

ETHICAL DECLARATIONS

Ethics Committee Approval

Ethical approval was obtained from the Institutional Review Board of Health Sciences University Ankara Atatürk Sanatorium Training and Research Hospital (Date: 11.12.2024, Decision No: 2024-BÇEK/180).

Informed Consent

Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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