

Prevalence and Comparison of HLA-B27 among Ankylosing Spondylitis Patients in Palestine and Arab Population

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Abstract

Background: HLA-B27 antigen is genetic markers which have a strong risk association with ankylosing spondylitis (AS). Data about HLA-B27 prevalence among Palestinian populations are very limited and controversial when compared to Western population's esp. in Mediterranean countries.

Objective: To investigate the incidence and prevalence of HLA-B27 among Palestinian populations and its association with ankylosing spondylitis (AS). To compare data from Palestinian populations with other larger studies done among Arab and African populations.

Methods: HLA-B27 was studied among a total number of one hundred twelve patients with symptoms of AS referred for further HLA-B27 genetic testing with AS symptoms were referred for genetic testing during the time period between January 2013 and January 2014 and 39 controls. DNA was extracted from a 200 µl peripheral blood then genotyped for polymorphisms by real time polymerase chain reaction chain reaction system. Published studies of HLA-B27 were reviewed in Arab patients. We divided Arab populations into three parts: A) Levant which includes Jordan, Syria, Lebanon, and Palestine, B) Arabian Peninsula which includes Saudi Arabia, UAE, Kuwait, Qatar, C) North Africa which includes Egypt, and Morocco. We looked up all the articles from PubMed and Medline addressing HLA-B27 prevalence among all these areas on AS patients and healthy individuals. We also searched for large studies conducted on western populations over the last couple of years for comparison.

Results: We observed that the general prevalence of HLA-B27 among Palestinian was 20.5% in which 10 (43.4%) male 8 (34.7%). The prevalence of HLA-B27 among patients with AS is 71% in Jordan, 60% Syria, 23.6% Lebanon, 58.7% Egypt, 29.3% Morocco, 67% Saudi Arabia, 25.7% Kuwait, 74% in Qatar and 56% UAE.

Conclusion: To conclude our study, HLA-B27 is presented in about 20% percent of the Palestinian population. Further comprehensive-cooperative research would be helpful if including the 3 health sectors would be very helpful in establishing a more accurate and comprehensive estimate of the size of the problem in Palestine and to further provide an accurate profile of AS in Palestine.

Keywords: HLA-B27; Ankylosing spondylitis; Palestinians; Arabs; PCR-SSP

Introduction

Ankylosing spondylitis (AS) is a group of diseases which share some epidemiological, clinical, immunogenetic features [1]. The human leukocyte antigen (HLA-B27) is strongly associated with ankylosing spondylitis and other related Spondylo-Arthropathies (SpAs). It is present in only 8% of the general population worldwide [2].

HLA-B27 has the most important role in pathogenesis of AS and contributes to 20% to 30% of the genetic risk. HLA-B27 is positive in 90% to 95% of Caucasian AS patients [3].

AS occurs in up to 75% of monozygotic twins compared to 27% in the Middle East, lower figures were reported from Arab countries, that

is, United Arab Emirates (UAE) 0.5%, Saudi Arabia 2.6%, Kuwait 4%, Iraq 2.1%, Lebanon 1.4%, Tunisia 3.2%, and Syria 1.4% [4-10].

On the other hand, a remarkably higher percentage was found in Yemeni population (17%) [8]. HLA-B27 is present in 80-95% worldwide [11]. However, HLA-B27 in Arab world is generally lower than the worldwide figure, ranging from 56 to 84%: 84% in Iraq, 56% in UAE, 67% in Saudi Arabia, 58.6% in Egypt, 60% in Syria, and 73.4% in Iran [4,11,12].

However, the exact pathogenesis of AS and its relation to HLA-B27 is still remains poorly elucidated. This is the first study in Palestine to assess the prevalence of HLA-B27 among patients with AS who are residents in Palestine (locals and expatriates). The study further aims to investigate the distribution and the prevalence of human leukocyte antigen B27 (HLA-B27) among un healthy patient esp. among AS patients in a Palestine cohort which is not investigated.

Patients and Methods

The research was carried out in two stages:

- The laboratory and
- The literature review

Laboratory

A retrospective review of one hundred nineteen patients with symptoms of AS were referred for HLA-B27 genetic testing during the time period between January 2013 and January 2014. Palestine is an Arab country, in the Middle East with different locals and expatriates. The study was conducted in the Euro lab medical center in which all samples were referred by different outpatient clinics for further genetic analysis during the time period between January 2013 and January 2014. The study samples were composed of 112 unhealthy persons (63 males, 49 females) who were sending to Euro lab for further genetic investigations concerning HLA. About 2 mL aliquots of peripheral blood samples of these patients were collected and stored in EDTA tubes. DNA was extracted from a 200 µl peripheral blood then; DNA amount and DNA purity were quantified for each DNA sample by Nano-drop. Genotyping of polymorphisms of AS patients and controls were performed by real time polymerase chain reaction chain reaction system. Simple statistical methods (median, frequency and percentage) where used.

Literature review

Published studies of HLA-B27 were reviewed in Arab patients. We divided Arab populations into three parts:

- Levant which includes Jordan, Syria, Lebanon, and Palestine.
- Arabian Peninsula which includes Saudi Arabia, UAE, Kuwait, Qatar.
- North Africa which includes Egypt and Morocco.

We looked up all the articles from PubMed and Medline addressing HLA-B27 prevalence among all these areas on AS patients and healthy individuals. We also searched for large studies conducted on western populations over the last couple of years for comparison.

Results

It represented as +ve HLA-B27 distribution among patient with AS in Palestine in which a total of 112 cases and 39 controls of Palestinian populations were typed for HLA-B27 using PCR-SSP. Of all the individuals (112), 23 were HLA-B27 positive (20.5%) in Palestine. The result of the analysis is presented in Tables 1-3.

Country	Number of AS patient	Percentage of +ve HLA-B27 antigen among AS Patient (%)	References	Number of health Individual	Percentage of +ve HLA-B27 antigen among healthy individual (%)
Palestine	23	20.50	1	89	N/A
Jordan	70	71.00	2	2579	2.40
Syria	50	60.00	3	217	1.40

Lebanon	16	23.60	4	N/A	N/A
Egypt	34	58.70	5	N/A	N/A
Morocco	46	29.30	6	76	3.20
Saudi Arabia	12	67.00	7	N/A	N/A
Kuwait	35	25.70	8	544	4.00
Qatar	66	74.00	9	N/A	N/A
UAE	16	56.00	10	N/A	N/A
N/A: No Available Studies					

Table 1: Comparison of HLA-B27 among ankylosing spondylitis patients in Palestine and Arabs population.

+ve HLA-B27 (Total: 23 (21%))		-ve HLA-B27 (Total: 89 (79.40%))	
Male	Female	Male	Female
10 (43.4%)	8 (34.7%)	53 (59.5%)	41 (46%)

Table 2: HLA-B27 distribution according to gender among patient in Palestine.

Region	Number	+ve HLA-B27	-ve HLA-B27
Center 1	8	2	6
South	46	11	35
North	3	0	3
Center 2	3	2	1
Private Hospital 1	3	2	1
Private Lab 1	1	0	1
Private Lab 2	1	0	1
Private Lab 3	1	0	1
Private Lab 4	1	0	1
Private hospital 2	1	0	1
Private Lab 5	1	0	1
Private Lab 6	1	0	1
Private Lab 7	1	1	0
Private Lab 8	1	0	1
Private Lab 9	2	1	1
Private Lab 10	3	0	3
Private Lab 11	1	0	1
Private Lab 12	1	1	0
Private Lab 13	33	3	30

Table 3: HLA-B27 distribution among patient with AS in Palestine according to region.

Discussion

Ankylosing spondylitis, is known to be highly heritable, with >90% of the risk of developing the disease determined genetically [13,14]. Genetic factors have been strongly implicated in its etiology [2]. Despite the prominence of HLA-B27 in genetic susceptibility of AS, its contribution to overall genetic predisposition is 16% to 40%.

Human leucocyte antigen-B27 is a MHC class I molecule that is encoded on chromosome 6p. There is a wide range of variation in the frequency of HLA-B27 allele and the distribution of its subtypes across populations which has a significant impact on the prevalence of AS in different racial/ethnic groups [15].

To our knowledge this is the first study to investigate HLA-B27 in a large number of different genetic traits of Palestinian population. The study was conducted to assess the prevalence of HLA-B27 among unhealthy patients with AS in Palestine. The prevalence in Palestinian is lower than the prevalence reported in Jordan of 75% and 81% and in Iraq of 84% [16-18].

However, in a study done in Turkey there was no association found between AS and IL23R rs11209032 and rs1004819 polymorphisms in this Turkish AS cohort [19-21]. Data from other Arabian Gulf countries showed that the prevalence of HLA-B27 is lower as in UAE, a study found the percentage was 56% among Arabs and none of them were locals in addition to the study sample was small (28 pts.) [22].

In contrast, the percentage of HLA-B27 among Emirian Arabs is extremely low (0.5%) [5]. In Saudi Arabia, HLA-B27 was checked in 12/15 Arabs, locals comprised 6/15, and the percentage was only 67% [7]. In Kuwait, the percentage was higher (77.8%), but in Kuwaitis were only 9 out of 58 [23].

In our study the percentage in 18 Palestinian patients 10 (43.4%) male, 8 (34.7%) female, which was slightly lower than the findings in 2 Jordanian papers, 75% in the first paper with total of 20 patients tested and 81% in the second paper with total of 52 patients tested [17,19].

Conclusion

This is the first study to evaluate the prevalence of HLA-B27 in Palestine and in unhealthy patient with AS also living in Palestine. Results suggest the prevalence of HLA-B27 among Palestinian patients is low and with good agreement the prevalence in Lebanon 23.6% and Egypt 29.3% but the findings is in contrast to Jordan 71%, Saudi Arabia 67% and Kuwait 25.7%.

There is a lack of knowledge about the percentage of HLA-B27 in healthy Palestinian. However, we have a huge lack of data among Arabs in different regions in addition to that; the studies conducted are few with small number of subjects. No data was found related to Libya, Yemen or Sudan. Further studies with larger number of patients and studies that look at the prevalence of AS in Palestine and at the prevalence of HLA-B27 in healthy Palestinian are needed. More wide based population studies are needed to prevent delays in diagnosis and to start the treatment earlier for better disease outcome.

Conflict of Interest

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

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