

Prevalence of HLAB27 in Patients of Central Madhya Pradesh

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Abstract

Introduction: The human Leucocyte antigen (HLA) system is the locus of genes that encodes for protein on the surface of the cells that are responsible for regulating the human immune system. They play an important role in disease defense, are a major cause of rejection in organ transplant patients. The first association of HLA to inflammatory diseases was discovered in 1972 correlating it to ankylosing spondylitis. After that numerous studies have been conducted associating more than 100 diseases like ocular and systemic diseases to HLA-B27. Present retrospective study was conducted with the aim of establishing the prevalence of HLA-B27 positivity in patients coming to our diagnostic centre from January 2014 to May 2015. *Materials and Methods:* This was a retrospective study conducted on 700 patients coming to our diagnostic centre for HLA B27 testing for different clinical conditions from January 2014 to May 2015. Test was performed by flow cytometry and all positive tests were confirmed by PCR Microarray Biochip technology for allele specific disease association. *Results:* There were 305/700(43.5%) males and 395/700(56.5%) females. Male to female ratio was 0.76:1. Out of 700 patients included in the study, 82 patients were positive for HLAB27. The positivity rate was 11.7%. 54 were males (65.8%) and 28 (34%) were females. Out of 82 positive cases 56 patients had symptoms of arthritis (68.2%), 15 (18.2%) had IBD, 5 (6.0%) had ocular symptoms, 4(4.87%) had symptoms of backache, 1 each (1.21%) had nonspecific symptoms. *Conclusion:* The low rate of positivity of HLA B27 in our study population support the view that HLA B27 should not be used as a routine test. However a larger study involving larger population with different racial and ethnic groups of India is needed to establish the role of HLA B27 as a diagnostic and prognostic marker for arthritis, IBD, uveitis and other inflammatory diseases

Keywords: HLA B-27; MHC; IBD; AAU; Ankylosing Spondylitis.

Introduction

The human Leucocyte antigen (HLA) system is the locus of genes that encodes for protein on the surface of the cells that are responsible for regulating the human immune system.

The HLA genes reside on chromosome 6 and encodes the cell surface antigen presenting protein except RBCs [1]. HLA has many functions. HLA genes are a group of major histocompatibility (MHC) genes

that are found in vertebrates. They play an important role in disease defense, are a major cause of rejection in organ transplant patients. The first association of HLA to inflammatory diseases was discovered in 1972 correlating it to ankylosing spondylitis [2]. After that numerous studies have been conducted associating more than 100 diseases like ocular and systemic diseases to HLA-B27 [3]. These diseases include reactive arthritis (Reiter's syndrome), inflammatory bowel disease (IBD), psoriatic arthritis, acute anterior uveitis (AAU) and ankylosing spondylitis to name a few. HLA B27 occurs in 50-90% of patients of ankylosing spondylitis. 19-88% patients of AAU have HLA B27 phenotype [4]. Approximately 50-75% patients with spondylitis and IBD have HLAB27 [2] [2].

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Present retrospective study was conducted with the aim of establishing the prevalence of HLA-B27 positivity in patients coming to our diagnostic centre from January 2014 to May 2015.

Materials and Methods

This was a retrospective study conducted on 700 patients coming to our diagnostic centre for HLA B27 testing for different clinical conditions from January 2014 to May 2015.

For HLA B27 typing blood was collected in K₃EDTA. Test was performed by flow cytometry and all positive tests were confirmed by PCR Microarray Biochip technology for allele specific disease association. Patients were divided into 0-20, 21-40, 41-60, 61-80 and more than 80 years age group. There were 305/700(43.5%) males and 395/700(56.5%) females. Male to female ratio was 0.76:1 maximum patients 44.50%(312/700) were in 41-60 years of age group, followed by 280/700(40%) in 21 to 40 years age group. There was only one patient in more than 80 years age group. Table 1 shows the demographic data

of patient enrolled for the study. In the 41-60 years age group females were more than males (210/312). Similarly in 61 to 80 years age group females were more (41/61). In all the other age groups there was a male preponderance.

Results

Out of 700 patients included in the study, 82 patients were positive for HLAB27. The positivity rate was 11.7%. 54 were males (65.8%) and 28 (34%) were females (Table 2).

Out of 82 positive cases 56 patients had symptoms of arthritis (68.2%), 15 (18.2%) had 1BD, 5 (6.0%) had ocular symptoms, 4(4.87%) had symptoms of backache, 1 each (1.21%) had nonspecific symptoms. The 82 positive patients were further divided into 0-20, 21-40, 41-60, 61-80 and more than 80 years (Table 3).

Maximum patients 45 (54.8%) were in 21-40 years age group with M:F ratio of 2:1, followed by 22 patients (26.8%) in 41-60 years of age group. There was only one female patient (1.21%) in 61-80 years age group.

Table 1: Showing demographic data of patients

Age Years	Male	Female	Total	Percentage
0-20	32	14	46	6.57%
21-40	151	129	280	40%
41-60	102	210	312	44.50%
61-80	20	41	61	8.71%
> 80	0	1	1	0.14%
Total	305	395	700	
Percent	43.50%	56.50%	100%	

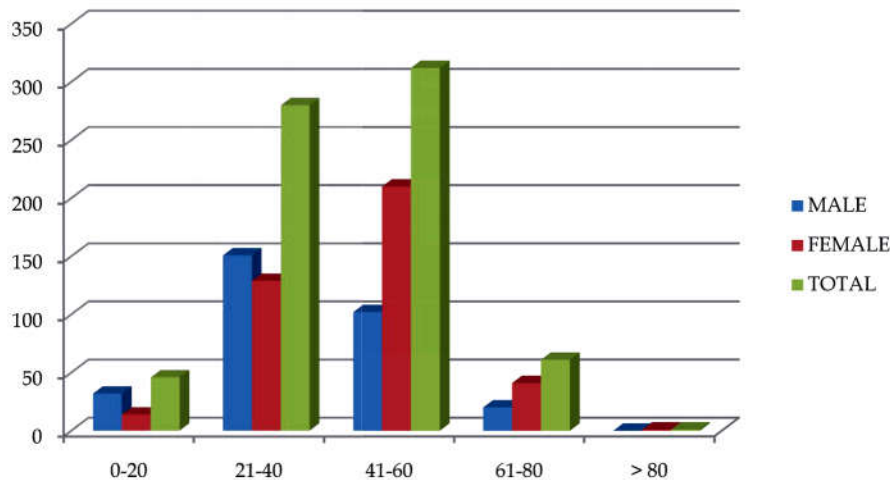


Fig. 1: Showing demographic data of patients

Table 2: Showing distribution of patients according to speciality

Speciality	Male	Female	Total	Percentage
Ortho	34	22	56	68.20%
Medicine	12	3	15	18.20%
Ophthal	5	0	5	6.00%
Neuro	3	1	4	4.87%
Gyanaec	0	1	1	1.21%
Rheumat	0	1	1	1.21%
Total	54	28	82	
Percent	65.80%	34.10%	100%	

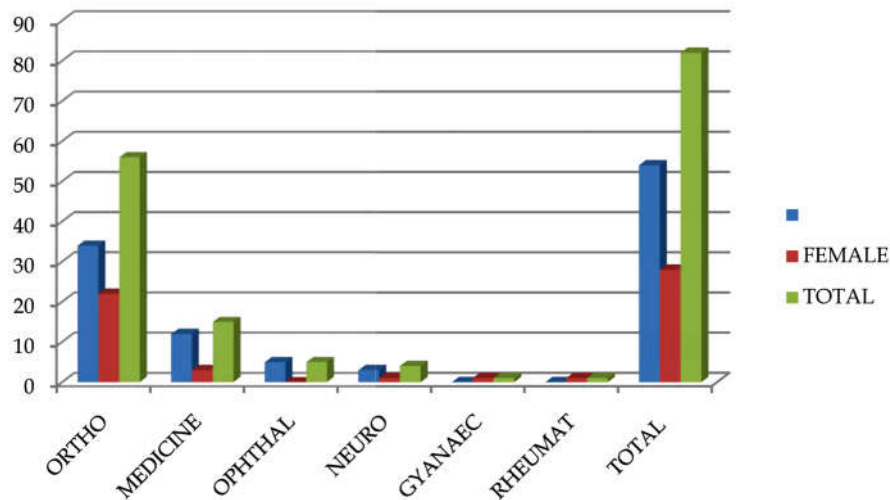


Fig. 2: Showing distribution of patients according to speciality

Table 3: Showing Demographic Data of HLA B27 Positive Patients

Age Yrs	Male	Female	Total	Percent
0-20	11	3	14	17%
21-40	30	15	45	54.80%
41-60	10	12	22	26.80%
61-80	0	1	1	1.21%
>80	0	0	0	0%
TOTAL	51	31	82	
PERCENT	62.10%	37.80%	100%	

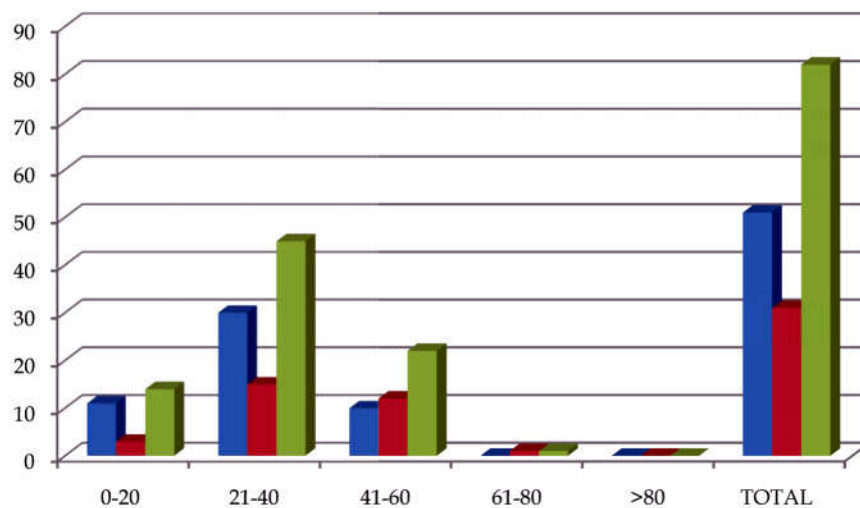


Fig. 3: C showing HLA b27 positive patients

Out of the overall positive patients 62.1% (51/82) were males and 37.8% (31/82) were females. The M:F ratio was 1.6:1 there was an overall male preponderance.

Discussion

The MHC system genetically encodes HLA system in humans which is found on chromosome 6. There are three classes of gene products which are encoded in the MHC. Class I MHC molecule include HLA -A, HLA-B and HLA-C and serve as antigen presenting platform for CD8 cells (T-suppressor cell) these molecules are present on all nucleated cells. T cell receptors have specific structural grooves in their tertiary structure where class I and class II molecules present their antigens. Mutations in these binding sites lead to inappropriate binding of these molecules resulting in autoimmune and inflammatory conditions. The actual role of HLA-B27 in the inflammatory response process is still not understood very well. Several theories like molecular mimicry, HLA-B27 misfolding hypothesis, heavy chain homodimer hypothesis etc. have tried to explain the potential pathological mechanism. HLA-B27 may be a simple marker locus, closely linked to a gene which triggers the true immune response causing inflammation [5]. HLA-B27 consists of at least 100 subtypes and is present in 1.4 to 8% of the general population [6,7].

Our study had 6% cases of uveitis showing HLA positivity with male preponderance. Our study correlates with the findings of Navin Mishra et al [8]. The incidence of uveitis in Asian population is 6-13% [9,10,11].

The positivity rate of HLA B27 in arthritis patients was 68.2% with a male preponderance (34/56). Our study correlates with the study by M.H. Abdel Rahman et al who demonstrated a positivity rate of 61% in Asian population [12]. The overall HLA B27 positivity rate in our population was 11.7% with male preponderance (65.8%). In the study by Roohi Rasul et al in Kashmir there was an overall 0.93% HLA B27 positivity [13].

HLA B27 can be helpful in patients complaining of low backache with signs of inflammation but absent radiological signs [14]. However, not only genetic factors are responsible for HLA B27 positivity as both reactive arthritis and ankylosing spondylitis have been seen in HLA-B27 negative patients also [15].

The discovery that there is a link between HLA - B27 and inflammatory diseases was one of the major advances in Rheumatology in the last century [16]. Later, its association with uveitis, IBD and other inflammatory diseases was identified.

Conclusion

The low rate of positivity of HLA B27 in our study population support the view that HLA B27 should not be used as a routine test. However a larger study involving larger population with different racial and ethnic groups of India is needed to establish the role of HLA B27 as a diagnostic and prognostic marker for arthritis, IBD, uveitis and other inflammatory diseases.

Conflict of Interest

none

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