Prevalence of HLA-B27 among donors and recipients for renal and bone marrow transplantation in Mauritius

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Accepted: 4 November 2003

ABSTRACT

In this study, the frequency of the tissue antigen HLA-B27 is studied in 494 donors and recipients for renal and bone marrow transplantation on the multi-ethnic island of Mauritius, the majority of the population of which is of Indian descent. Although results showed a prevalence rate of 4.3%, inter-racial variation was not observed between the major ethnic groups ($P>0.05$). These findings are comparable with the results of studies on HLA-B27 prevalence rate in India, and lend support to the argument that the HLA-B27 test should not be used on a routine basis to diagnose HLA-B27-related rheumatic disorders in Mauritius.

KEY WORDS: Ethnic groups.
HLA-B27 antigen.
Mauritius.

Introduction

The association of HLA-B27 with the spondylarthropathies remains one of the best examples of a disease association with a hereditary marker. HLA-B27 is recognised as representative of a spectrum of conditions, ranging from the majority of HLA-B27-positive individuals who are healthy, through those with isolated eye or skin involvement, to those with critical eye, heart and peripheral joint problems characteristic of full-blown ankylosing spondylitis (AS).

Initial observations of the association of HLA-B27 with AS were made in Caucasians from Europe and North America. Subsequent studies have established the presence of HLA-B27 in AS patients in almost every ethnic group, including Japanese, Chinese, Native Americans, Brazilians, Mexicans, African-Americans, Asian Indians, Iranians, Iraqis, Israelis, Lebanese, and Alaskan and Siberian Eskimos.

However, the prevalence of HLA-B27 varies among populations and ethnic groups worldwide. Prevalence of 50% among the Haida Indians (living on Queen Charlotte Islands of the Canadian province of British Columbia) to its virtual absence among the genetically 'pure' native populations of South America, Australia, and among equatorial and southern African Bantus and Sans (Bushmen) have been reported.[1-8]

Mauritius is an island with a population of 1.2 million people, comprising a range of ethnic groups including Indians (Hindus and Muslims), Creoles (African origin), Chinese and Caucasians. HLA-B27 typing has only been available on the island since 1996 and currently there is no data on the prevalence of this tissue antigen in the Mauritian population.

The Ministry of Health and Quality of Life introduced a register of HLA typing prior to renal and bone marrow transplantation for requests for suspected HLA-B27-related rheumatic disorders. This data formed the starting point for the present study, which was undertaken to establish the prevalence of HLA-B27 among donors and recipients for renal and bone marrow transplantation in Mauritius.

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Materials and methods

HLA-B27 status, sex and ethnic origin of 494 donors and recipients for renal and bone marrow transplantation were abstracted from the HLA registry at the Central Laboratory of the Victoria Hospital in Mauritius. The study population comprised 272 males and 222 females who underwent HLA tissue typing over the six-year period January 1996 to January 2002. Typing for the HLA-B27 antigen was performed using the NIH lymphocyte microcytotoxicity technique.[9] Approval was obtained from the Ministry of Health and Quality of Life to undertake this study.

Statistical analyses were performed by χ^2 or Fisher's exact test, as applicable. P values ≤ 0.05 were considered significant. SPSS (Version 10.0) was used as the statistical package.

Results

Of the 494 study participants, 116 were of African descent (23.5%), 15 were of Chinese descent (3%), 12 were of European descent (2.4 %) and 351 were of Indian origin (71.1 %). Demographic data and HLA-B27 frequency are presented in Table 1.

Results showed that HLA-B27 prevalence in the whole study population was 4.3% but data analysis failed to reveal any statistical significance in individual HLA-B27 prevalence among the different ethnic groups ($P>0.05$). Furthermore, there were no significant differences in HLA-B27 prevalence between males and females.

Table 1. HLA-B27 status, sex and ethnic origin of the study population ($n=494$).

Parameters		Number	%
HLA – B27	Positive	21	4.3
	Negative	473	95.7
Sex	Male	272	55.1
	Female	222	44.9
Origin	African	116	23.5
	Chinese	15	3.0
	European	12	2.4
	Indian	351	71.1

Discussion

A strong association between the tissue antigen HLA-B27 and the spondylarthropathies including AS is well established, but the strength of this association varies considerably between racial and ethnic groups.

This study showed that the prevalence of HLA-B27 in Mauritius is 4.3% in a population of ethnic diversity originating in Africa, China, Europe and India. The findings support other studies that have reported low rates in black Africans, communities in the north-west part of China, the United Arab Emirates, Pakistan and India.[1,10-13]

The prevalence rate in the present study was lower than that reported by Chopra *et al*.,[11] who found a rate of 8.3 % in healthy Indians in Pune (west India), but higher than the 1.7 % found in Indians in Bombay by Bale *et al*.[12] However, in Pakistanis, Zaffar *et al*.[13] reported a rate of 4.7 % among 985 prospective recipients or donors for renal transplantation in Karachi.

Analysis of the data from the various ethnic groups in the present study indicates an absence of inter-racial variation. This finding agrees with the lack of a statistically significant difference among major ethnic groups in the United Arabs Emirates reported by Al-Attia and Al-Amiri,[13] who compared a sample population based on nationality (mainly of Arab origin) and found an overall prevalence rate of 6.4%.

There has been much controversy about the clinical importance of HLA-B27 determination, and its value is questioned because of the relatively high cost of the procedure.[14] Thus, it could be argued that HLA typing should not be used as a routine diagnostic tool. □

In summary, the present study, which was the first of its kind to be undertaken in Mauritius from data available from the HLA-B27 registry, revealed a prevalence rate for this tissue antigen of 4.3% among donors in Mauritius. This suggests that the local risk of developing HLA-B27-associated diseases is low and lends support to the argument that HLA-B27 should not be used as a routine test to diagnose HLA-B27-related rheumatic disorders in Mauritius.

References

1 Khan MA, van der Linden SM. Ankylosing spondylitis and other spondylarthropathies. *Rheum Dis Clin North Am* 1990; **16**: 551–79.

2 Khan MA. HLA-B27 and its subtypes in world populations. *Curr Opin Rheumatol* 1995; **7**: 263–9.

3 Gran JT, Husby G. The epidemiology of ankylosing spondylitis. *Semin Arthritis Rheum* 1993; **22**: 319–34.

4 Braun J, Bollow M, Reminder G *et al*. Prevalence of spondylarthropathies in HLA-27 positive and negative blood donors. *Arthritis Rheum* 1998; **41**: 58–67.

5 Liu Y, Chen B, Helenius H, Granfors K. 2001, Familial aggregation of ankylosing spondylitis in Southern China. *J Rheumatol* 2001; **28**: 550–3.

6 Sampaio-Barros PD, Bertolo MB, Kraemer MSH, Neto JFM, Samara AM. Primary ankylosing spondylitis: patterns of disease in a Brazilian population of 147 patients. *J Rheumatol* 2001; **28**: 560–5.

7 Awada H, Abi-Karam G, Badadoura R, Okais J, Attoui S. Clinical, radiological, and laboratory findings in Lebanese spondylarthropathy patients according to HLA-B27 status. *Bone Spine* 2000; **67**: 194–8.

8 Mijiyawa M, Oniankitan O, Khan MA. Spondyloarthropathies in sub-Saharan Africa. *Curr Opin Rheumatol* 2000; **12**: 281–6.

9 Lymphocyte microcytotoxicity technique. In: Roy JG Jr, Pedersen PD, Kayhole DE *et al*., eds. *Manual of tissue typing techniques*. Bethesda: National Institutes of Health, 1974: 20–2.

10 Chang NC. Rheumatic diseases in China. *J Rheumatol* 1983; **10** (Suppl 10): 41–4.

11 Chopra A, Raghunath A, Singh A, Subramanian AR. The pattern of rheumatoid arthritis in the Indian population: a prospective study. *Br J Rheumatol* 1988; **27**: 454–6.

12 Bale UM, Mehta MM, Contractor NM, Bhatia HM, Tilve GH. HLA-B27. *Indian J Med Res* 1980; **71**: 96–100.

13 Al-Attia HM, Al-Amiri N. HLA-B27 in healthy adults in UAE. *Scand J Rheumatol* 1995; **24**: 225–7.

14 Linssen A, Feltkamp TE. B27-positive diseases versus B27-negative diseases. *Ann Rheum Dis* 1988; **47**: 431–9.