

HLA-A association with psoriasis in a south Indian population

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Abstract

Background: Psoriasis is a common skin disorder affecting around 3% of the population worldwide. HLA association with psoriasis is well established with very little information about Indian Population. **Aim:** To determine the HLA-A pattern and its association in psoriasis patients. **Materials and Methods:** 50 cases and 50 controls were enrolled in the study. HLA-A typing was done by PCR-SSP method and the results was analysed and interpreted. **Results:** The alleles that was found in higher frequency in the cases than in the controls – HLA-A*02(36%), HLA-A*11(32%), HLA-A*03 and HLA-A*24(30%). **Conclusion:** HLA-A*11 shows a strong association with psoriasis and HLA-A*01 shows decreased association with psoriasis in the present study.

Keywords: HLA-A, Psoriasis, Relative Risk, Association.

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Received Date: 20/03/2016 Revised Date: 14/04/2016 Accepted Date: 04/05/2016

Access this article online

Quick Response Code:



Website:

www.statperson.com

DOI: 06 May 2016

genetic component of Psoriasis is being supported by HLA association, embedded in the genes located within the major histocompatibility complex (MHC) on the short arm of the chromosome 6¹⁴. HLA system consists of class I (A, B and C), Class II (DQ, DP and DR) and class III antigens. Class I antigens are present on all nucleated cells and class II antigens are present on B lymphocytes, macrophages and monocytes.^{6,8} Studies on association of HLA with Psoriasis has been carried out since early 1970's. Russell *et al.*, and White *et al.*, were the first two independent investigators who showed HLA association in Psoriasis^{9,10}.

INTRODUCTION

Psoriasis is derived from the Greek word 'PSORA' meaning scale. The disease psoriasis was first described by Robert Willian in the early 19th Century¹. Psoriasis is an immune mediated disorder affecting the skin, nail and joints with genetic factors playing an important role in the etiology. The prevalence of psoriasis world-wide ranges from 1 to 11.8%^{2,5}. The prevalence rate reported in India is mostly from hospital based studies and it ranges between 0.5 to 2.8% with male preponderance twice as that of females. The association between HLA and Psoriasis is well established but studies showing these associations are mostly from the Western Population with very little information about the Indian population^{3,4}. The

MATERIALS AND METHODS

This study was conducted in the Department of Transfusion Medicine and Department of Human Genetics at a tertiary care University hospital during the period April 2014 to March 2016. 50 Psoriasis patients and 50 healthy controls were included in the study. This study was approved by the Institutional Ethics Committee and the samples were collected from the participants after obtaining informed consent.

Study Design: This was a prospective case control study in which participants were enrolled according to the inclusion and exclusion criteria.

Inclusion Criteria (Cases): All Psoriasis patients, Psoriasis with arthropathy.

Exclusion Criteria (Cases): Pregnant women, Guttate Psoriasis, Erythroderm Psoriasis.

Inclusion Criteria (Controls): Blood donors eligible for donation

Exclusion Criteria (Controls): Not willing for the study. 3 ml of blood samples (EDTA) were collected after obtaining informed consent. DNA isolation was done as per the Department SOP and the kit manufacturer’s instructions (Qiagen) and the isolated DNA was stored in the freezer at - 86°C. HLA typing for class I HLA-A was performed on the 50 cases and 50 controls as per the manufacturer’s instructions(BAG).PCR–SSP(Polymerase Chain Reaction – Sequence Specific Primers) method was used to perform the HLA- A typing and the amplified PCR product was subjected to agarose gel electrophoresis. HLA results were analysed and interpreted.

RESULTS

A total of 50 patients and 50 controls were included in the study. Among the 50 patients,18 were female and 32 were male. The age group of the patients was between 24-76 years. 8 patients had Psoriasis with Arthropathy. A total of 50 controls were included in the study of which 4 were female and 46 were male. The controls were in the age group 18 to 60 years.

HLA- A results

The HLA – A antigens which were found in increased frequency among 50 Psoriasis patients were – HLA – A*02 (36%), HLA-A*11(32%), HLA-A*03 (30%), HLA – A*24(30%). The HLA – A antigens which were found in increased frequency among 50 Controls – HLA – A*03 (36%). HLA – A*02 (30%), HLA – A*01 (30%), HLA – A* 24 (20%). Statistical analysis was done to determine their significance.

The significant findings of the study includes HLA - A*11 which was present in higher frequency in the cases when compared with the controls (HLA – A* 11 present in 16 cases and in only 6 controls). The odds ratio and the p value was calculated and found to be statistically significant (Odds ratio 3.45 and p value 0.02). HLA-A*01 was found in higher frequency in the controls than in the cases (15 controls and 8 cases). The odds ratio was 0.44 and p value for this particular allele was 0.15.

Table 1: HLA – A antigen distribution in Psoriasis patients

Sl.No.	Age / Sex	Cases
1	47 / M	HLA-A* 02,11
2	29 / M	HLA-A* 11,33
3	58 / M	HLA-A* 03,24
4	58 / M	HLA-A* 02,31
5	52 / F	HLA-A* 02,11
6	50 / F	HLA-A* 03,15

7	55 / F	HLA-A* 01,24
8	50 / F	HLA-A* 02,23
9	65 / F	HLA-A* 02,11
10	76 / M	HLA-A* 03,36
11	51 / F	HLA-A* 03,29,
12	59 / F	HLA-A* 03,24
13	32 / F	HLA-A* 02,11
14	47 / M	HLA-A* 01,24
15	59 / M	HLA-A* 03,36
16	47 / F	HLA-A* 03,11
17	26 / F	HLA-A* 02,24
18	54 / F	HLA-A* 02,23
19	61 / F	HLA-A* 02,23
20	55 / F	HLA-A* 26,30
21	50 / F	HLA-A* 01,03,
22	55 / M	HLA-A* 68,33
23	30 / M	HLA-A* 24,68
24	45 / M	HLA-A* 11,33
25	32 / M	HLA-A* 02, 11
26	42 / M	HLA-A* 03,24
27	45 / M	HLA-A* 02,23
28	58 / M	HLA-A* 02,11
29	62 / M	HLA-A* 03,36
30	28 / M	HLA-A* 01,24
31	24 / M	HLA-A* 24,33,
32	34 / M	HLA-A* 02,24,
33	36 / M	HLA-A* 23
34	40 / F	HLA-A* 03,32,
35	54 / F	HLA-A* 11,31,
36	28 / M	HLA-A* 02,31,
37	55 / M	HLA-A* 24,68,
38	50 / M	HLA-A* 02,11,
39	30 / M	HLA-A* 03,24,
40	45 / M	HLA-A* 01,24,
41	55 / M	HLA-A* 11,33,
42	40 / F	HLA-A* 01,24,
43	28 / M	HLA-A* 02, 23
44	30 / F	HLA-A* 03,36,
45	28 / M	HLA-A* 03,11,
46	56 / M	HLA-A* 01,03,
47	35 / M	HLA-A* 02,24,
48	25 / M	HLA-A* 02,11,
49	34 / M	HLA-A* 11,33,
50	50 / M	HLA-A* 01,11,

Table 2: HLA – A antigen distribution in healthy controls

Sl.No.	Age / Sex	Controls
1	35 / M	HLA – A* 01, 26
2	40 / F	HLA – A* 03,26
3	28 / M	HLA – A* 02, 03
4	30 / F	HLA – A* 03, 32
5	48 / M	HLA – A* 02
6	54 / M	HLA – A* 02, 33
7	35 / M	HLA – A* 03, 11
8	30 / M	HLA – A* 01
9	28 / F	HLA – A* 24
10	56 / F	HLA – A* 25, 32
11	35 / M	HLA – A* 01, 24

12	25 / M	HLA – A* 03, 33
13	30 / M	HLA – A* 01, 03
14	34 / M	HLA – A* 31, 68
15	21 / M	HLA – A* 02, 03
16	54 / M	HLA – A* 01,11
17	19 / M	HLA – A* 03, 11
18	25 / M	HLA – A* 02, 68
19	25 / M	HLA – A* 24, 30
20	24 / M	HLA – A* 03
21	19 / M	HLA – A* 03, 24
22	50 / M	HLA – A* 02, 03
23	25 / M	HLA – A* 03, 26
24	22 / M	HLA – A* 24, 68,
25	27 / M	HLA – A* 11, 68
26	28 / M	HLA – A* 26, 30
27	29 / M	HLA – A* 01, 02
28	44 / M	HLA – A* 02
29	34 / M	HLA – A* 01, 33
30	19 / M	HLA – A* 03
31	28 / M	HLA – A* 24, 30
32	29 / M	HLA – A* 01,02
33	21 / M	HLA – A* 02,26
34	20 / M	HLA – A* 02, 26
35	31 / M	HLA – A* 01, 74
36	19 / M	HLA – A* 02,31
37	24 / M	HLA – A* 02, 24
38	29 / M	HLA – A* 24, 31
39	19 / M	HLA – A* 02,31
40	21 / M	HLA – A* 01, 24
41	29 / M	HLA – A* 11,68
42	23 / M	HLA – A* 01,24
43	23 / M	HLA – A* 01,03
44	22 / M	HLA – A* 01,68
45	23 / M	HLA – A* 03,68
46	22 / M	HLA – A* 03,30
47	28 / M	HLA – A* 01,11
48	24 / M	HLA – A* 03
49	21 / M	HLA – A* 01,02
50	28 / M	HLA – A* 03

DISCUSSION

This study shows the strong association of HLA- A*11 with psoriasis contributing to its susceptibility. The other HLA alleles which were found in higher frequency were HLA – A* 02, HLA- A*03 and HLA- A*24 but these alleles were found to be in the control population also thereby implying not to have a strong association in the disease susceptibility. Comparing these results with a different ethnic population from India shows varying results as discussed below. A study from Western Indian population showed HLA- A*02 to have a stronger association with Psoriasis than in the controls (Odds Ratio-3.976, p value < 0.0001)¹⁵. The frequency of HLA- A*02 in this study was found to be 36% (18/50). The odds ratio was 1.31 and the p value for this allele was 0.54. Another study reports HLA- A*01 and HLA- A*02

to have a strong association with Psoriasis^{15,16,17}. In this study, HLA- A*01 was found in 16 % (8/50) patients with the odds ratio of 0.44% and p value of 0.15 implying that HLA- A*01 was significantly decreased in Psoriasis patients. Yet another study from India reports increased frequency of HLA-A *01 in psoriasis patients when compared to healthy controls.⁶The study showed HLA- A*01 to have a relative risk of 2.76 in developing psoriasis (p value 0.0025).Comparing it with our study, HLA-A*01 showed decreased association with psoriasis (HLA-A*01 Relative Risk -0.62). A study from North India reveals higher frequency of HLA-A*01,HLA-A*24,HLA-A*28,HLA-A*30 among psoriasis patients than controls^{11,12,13}. HLA-A*24 had a relative risk of 1.30 in our study and HLA-A*28 was not found in either of the cases and the control group. In our study, HLA-A*30 had a relative risk of 0.39 suggesting this allele shows a decreased association with psoriasis. HLA association however tends to differ between patients of various racial and ethnic backgrounds.

SUMMARY AND CONCLUSION

This study ascertains that certain HLA- A alleles have been found to have a stronger association with Psoriasis and differs between ethnic population. HLA- A*11 shows a strong association with Psoriasis and HLA- A*01 shows decreased association with Psoriasis in the present study.

ACKNOWLEDGEMENT

We express our sincere thanks to ICMR, New Delhi for funding the study.

REFERENCES

1. Enno Christopher and Ulrich Mrowietz.Psoriasis-Braun-Falco's Dermatology 506.
2. Kaur I, Kumar B, Sharma V.K., Kaur. S, Epidemiology of Psoriasis in a clinic from North India. Ind. J. Dermatol. Venerol. Leprol. 1986; 52:208-12.
3. Bedi.T.R,et al.Psoriasis in North India-geographical Variations.Dermatologia 1977;155:310-4.
4. Sunil Dogra,Savita Yadav,Psoriasis in India:Prevalance and Pattern.Ind J Dermatol Venerol Leprol 2010;76:595-601.
5. Gelfand J.M., Weinstein. R, Porter S.B., Berlin J.A., Margolis. D.J. Prevalence and treatment of Psoriasis in the U.K.: A population based study. Arch. Dermatol. 2005;141:1537-41.
6. Chablani U.A., Contractor N.M., Gadgil R.B.. HLA and complement C4 studies in Psoriasis Vulgaris. Natl. Med. J India. 1992;5:8-11.
7. Pictchappan et al. HLA B57 and DR7 association with psoriasis vulgaris in South India. Tissue Antigens 1989;34:133-7.
8. Rani R, Narayanan R, Fernandez M.A., Stastany. P. Role of HLA B and C alleles in the development of Psoriasis in

- patients from North India. *Tissue Antigens* 1998; 51:618-22.
9. Russel T.J., Schultes. L.M., Kuban D.J., HLA antigen associated with Psoriasis. *New Engl. J.Med.* 1972;287:737-40.
 10. White S.H., Mickey M.R., HLA antigen frequency in Psoriasis. *New Engl. J.Med* 1972;287:740-43.
 11. Tiwari JL,Terasaki PI.HLA and Disease Association.New York;Springer 1985;16:145-48.
 12. Sasazuki T,Mathushita S,Nakamizo V et al HLA and Psoriasis in Asian populations Joint Report In 1986;23:349-353.
 13. Singh S,SinghU,Singh S HLA in patients with psoriasis.*Ind J Dermatol Venerol Leprol* 2011;77:535-37.
 14. Bach F.H,Van Rood,The Major Histocompatibility Complex:Genetics and Biology.*New Engl J Med* 1976;295:806-813.
 15. Shankarkumar Umapathy,R Mitra,Arun Pawar,K Ghosh HLA –A and HLA-B alleles associated in psoriasis patients from Western India. *Ind J Dermatol Venerol Leprol* 2011;56(5):497-500.
 16. Ikaheimo,Silvennoinen-Kassinen S,Karvonen J.Immunogenetics profile of psoriasis vulgaris.*Arch Dermatol Res* 1996.288:63-67.
 17. Gonzaga HF,Torres EA Both psoriasis and benign migratory glossitis are associated with HLA.*Br J Dermatol* 1996;135:368-370.

Source of Support: None Declared
Conflict of Interest: None Declared