Association of HLA-A*3101 with Carbamazepine induced idiosyncratic drug reactions in patients diagnosed with epilepsy

Vivek Kumar Garg[1*], Manish Modi[1], Madhu Khullar[1], Bikash Medhi[1], Biman Saikia[1]

[1]Deaprtment of Neurology, Postgraduate Institute of Medical Education & Research, Chandigarh-160012, India

* Department of Medical Laboratory Technology, University Institute of Applied Health Sciences, Chandigarh University, Gharuan, Mohali 140413, Punjab, India

Background

Carbamazepine (CBZ) is commonly prescribed for trigeminal neuralgia, epilepsy, and several psychiatric disorders. It is first line antiepileptic drug used to treat partial and generalized tonic-clonic seizures (GTCS) but also induces both dose related and idiosyncratic drug reactions (IDRs). The most commonly linked pharmacogenomic variants to CBZ intoxication include those with in "human leukocyte antigen" (HLA) gene. So our main aim was to study the genetic associations of HLA-A*3101 in Carbamazepine induced IDRs.

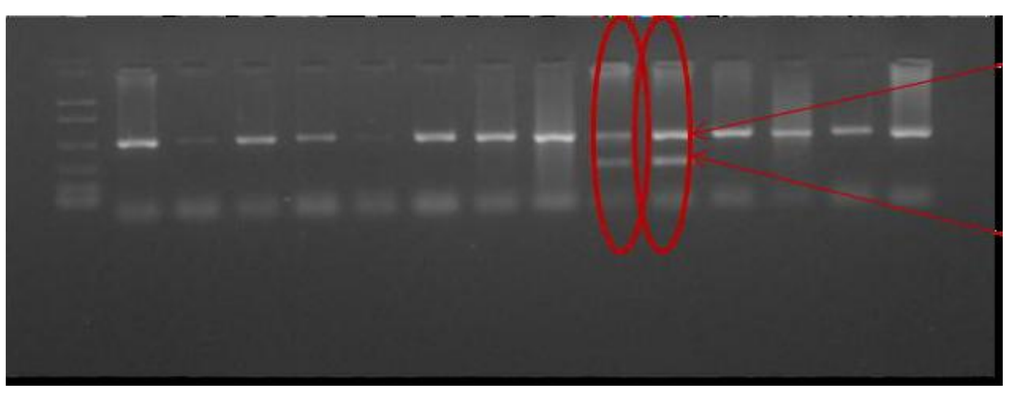
HLA-A*3101	Carbamazepine responsive patients, n=44 [genotype frequency (%age)]	Carbamazepine induced IDRs, n=41 [genotype frequency (%age)]	p-value
Positive	3 (6.8%)	3 (7.3%)	p= 0.93
Negative	41 (93.2%)	38 (92.7%)	

Association of HLA-A*3101 with Carbamazepine associated Idiosyncratic drug reactions (IDRs)

Materials and Methods

- The current study was a prospective observational case control study conducted at Department of Neurology, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh.
- The study was approved by Institute Ethics Committee vide Letter No Histo/14/135. A total of 85 patients diagnosed with epilepsy (41 with IDRs as cases and 44 without IDRs as controls) who presented to our OPD/emergency services and were administered with Carbamazepine were recruited in the study. Written informed consent was obtained from all the patients before enrollment in the study. HLA-A*3101 is said to be present when these 2 bands (430bp IC and 180bp) were positive in agarose gel electrophoresis

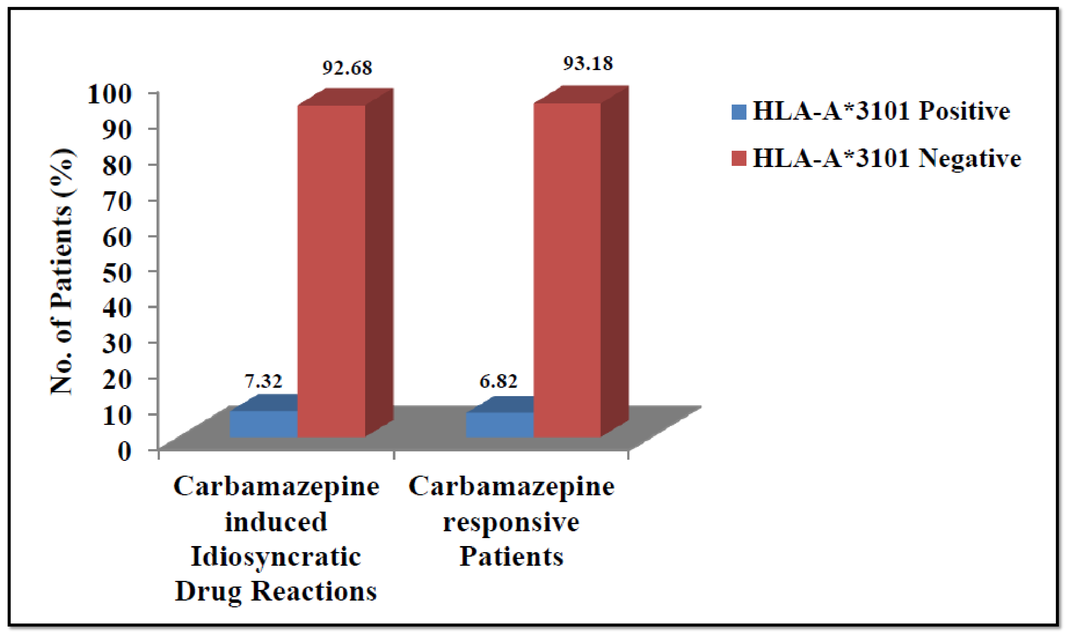
Gel images of HLA-A*3101. Red circles shows the patients with positive HLA-A*3101 allele



43 year old male with CBZ-induced Rash

Results

- 3 (7.3%) patients were positive and 38 (92.7%) were negative in cases and 3 (6.8%) patients were positive and 41 (93.2%) were negative in control. p-value was found to be 0.93 which was non-significant.



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Conclusion

HLA-A*3101 is not associated with CBZ-induced IDR. It may be due to inherent different in genetic profiles of different populations as many studies have shown that their significant association.

References

Amstutz U, Shear NH, Rieder MJ, Hwang S, Fung V, Nakamura H, Connolly MB, Ito S, Carleton BC; CPNDS clinical recommendation group. Recommendations for HLA-B*15:02 and HLA-A*31:01 genetic testing to reduce the risk of carbamazepine-induced hypersensitivity reactions. Epilepsia. 2014 Apr;55(4):496-506