7. SUMMARY

- To determine the incidence of HBV infection and other demographic characteristics among cases (HBV infected patient) and healthy controls. This case control study was designed and conducted in Chettinad Hospital and Research Institute which is a tertiary care hospital.
- The study was done in the department of microbiology over a period of 3 years (From August 2015 to July 2018).
- A total number of 53,374 blood samples were received from both inpatient departments (IPD) and outpatient departments (OPD).
- Total of 53,374 blood samples were screened for HBsAg antigen by rapid card method and later the seropositive samples were confirmed by ELISA method.
- Among them, 269 samples were reactive. The prevalence rate of seropositive of HBsAg in 3 year study was 0.62%.
- Among 269 seropositive patients, 182 patients were agreeable to take part in the study.
- The necessary data required for analysis of the demographic profile and clinical history relevant to the study was in the questionnaire form.
- Informed and written consent from each of the participants were documented.
- Majority of the seropositive patients were from General Surgery 50(27.5%), followed by Gastroenterology 40(22%), General Medicine 25(13.7%), Intensive Care Unit 22((12.1%), Obstetrics and Gynaecology 18(9.9%), Orthopaedics 14 (7.7%) and Ophthalmology 13(7.1%) department.
- Majority of the HBsAg seropositive participants (n= 182) were 32.4% among the age group 28-37 years (n=59)
- The selection of the healthy controls was matched 1:1 with subjects with HBV infection on the basis of age and sex.
- One hundred and eighty two controls were enrolled in this study for comparison with the HBV seropositive cases.
- There was no significant difference in the age, gender and place of living among case relative to controls.
- Statistically significant differences was observed in marital status and education between the cases and controls.
- Risk factors such as alcohol consumption (OR = 1.60, P= 0.05), tattooing (OR = 4.37, P= 0.003), a history of previous surgery (OR = 2.02, P= 0.012), family history of hepatitis infection (OR = 2.99, P =0.005) showed significant differences among the two groups.
- The frequency of other risk factors, such as history of blood transfusion (P= 0.132) and sharing nail clippers (P= 0.880) was seen higher in the patient group, no statistically significant difference were observed in the control group.
- In order to differentiate the stages of acute and chronic HBV infection in study participants, a test combination of the measurement of anti- HBe Total, anti- HBc IgM, HBeAg and anti-HBS were studied using an ELISA method.
- Patients who showed positive for HBsAg along with anti HBc IgM, anti-HBc Total, HBeAg and negative for Anti HBs serological markers indicates Acute hepatitis B (AHB) infection.
- Patients who are positive for HBsAg more than six months and also with history of early hepatitis infection showed positive for Anti-HBc Total, HBeAg and negative for Anti HBc IgM and AntiHBs serological marker indicates chronic hepatitis B (CHB) infection.
- Among the 182 study participants, 32 (17.6%) were found to be seropositive for Anti HBc IgM indicating the patient is suffering from acute infection.
- The remaining 150 of the patients were seronegative for Anti HBc IgM indicates that they are suffering from chronic infection.
- A seropositive for HBeAg specifies that the virus is replicating and the infected individual has high levels of the Hepatitis B virus.
- Among the 182 cases, 90 (49.5%) were found to be positive for HBeAg indicating that these patients were highly infectious. Out of 90 HBeAg seropositive cases, 18 (20%) were from acute infection and 72 (80%) were from chronic infection.
- The case group comprising of 32 AHB patients (positive HBsAg, AntiHBc Total, antiHBc IgM) and 150 CHB patients (positive HBsAg, anti HBc Total and negative antiHBc IgM) along with the control group (182) healthy donors (negative for all HBV seromarkers) were taken for the molecular analysis of HLA association.
- Among the 3 analyzed HLA class II alleles in the case group (n= 182), higher allele frequency was documented with DQB1*03:01 allele n= 86 (47.3%), followed by DRB1*07:01 allele n= 77(42.3%) and DPB1*09:01 n= 13 (7.1%) allele.
In the control group, higher allele frequency was documented with DRB1*07:01 allele n= 69 (37.9%), followed by DQB1*03:01 allele n= 36(19.8%) and DPB1*09:01 n= 16 (8.8%) allele

Allele frequency of HLA DRB1*07:01 in acute patients (65.6%) were markedly higher than those in the chronic hepatitis B group (37.3%), there was a significant correlation between them (Chi-square value= 8.649; P value 0.006; OR= 3.20). This findings suggest that HLA DRB1*07:01 is closely associated with the susceptibility to acute hepatitis B and may be the susceptible gene.

Allele frequency of HLA DQB1*03:01 in the chronic hepatitis B group (48.7%) were significantly higher than those in the normal control group (19.8%), there was a significant correlation between them (Chi-square value =31.1; P value 0.005; OR= 3.84). This findings suggest that HLA DQB1*03:01 is closely connected with the susceptibility to CHB and may be the susceptible gene.

The frequency of HLA DPB1*09:01 allele was higher in acute patients (15.6%) when compared to chronically infected patients (5.3%), significant correlation found between them. (Chi-square = 41.2; P value=0.000; OR=15.7).

HLA class II alleles (DQB1*03:01, DRB1*07:01, and DPB1*09:01) analysis stratified by gender revealed that the frequency of HLA DQB1*03:01 allele was higher among the case than the control group. There was a statistically gender wise significant correlation in HBV infected male (46.2% vs. 20.2%; OR= 3.40) and female (49.2% vs. 19%; OR= 4.11) than that of the control group.

HLA class II allele’s analysis stratified by age (≤ 36 years and ≥ 37 years) revealed that DQB1*03:01 allele was more common in HBV patients aged ≤ 36 years than the controls (46.8% vs. 20.3%; OR: 3.46).