CHAPTER 7
SUMMARY AND CONCLUSIONS

The current study was designed to shed light on many important aspects of HBV molecular epidemiology that are very much important for identifying the population at risk of acquiring HBV and developing severe disease, and also pose a risk of transmission through different modes.

Objective 1: Family screening based study of sero-prevalence of HBV in Northeast India.

- Overall data shows that males are more prone to HBV related chronic liver disease than women.
- Data from Manipur and Meghalaya showing the prevalence of chronic HBV related liver disease being almost uniform in both the sexes.
- The sero-prevalence of HBV in family contacts was found to be 14.48% (316/2182).
- A total of 172 cases (54.43%) out of the 316 sero-positive cases developed chronic hepatitis B infection.
- Majority of the patients who had chronic HBV infection based on family screening were females (59.88, 103/172), majorly wives of index patients (93.20, 96/103).
- Alternatively, it also indicates that other modes of spreading infection like earlier use of non-disposable glass syringes and needles as well as other unethical practices also contributes immensely in increasing the burden of chronic HBV infection.

Objective 2: Screening of the HBeAg status in the enrolled chronic HBV cases, and correlate with viral load, ALT and liver disease severity.

- After screening of the HBeAg and Anti-HBe screening, the patients could be categorized into 4 distinct groups, viz; e antigen positive, e antigen negative Anti-HBe positive, both e antigen and Anti-HBe negative, and both e antigen and Anti-HBe positive group.
- HBeAg positivity was found in a high percentage of cases of Northeast India, which is of significance as this subset of patients have high replication index of HBV and are more prone to progression of chronic liver disease to more advance liver disease.
- The high prevalence of e antigen negative Anti-Hbe negative cases in chronic HBV group (9.54%, 58/608) is of immense significance because screening and treatment of these subset of cases is critical and problematic.
The mean viral load in chronic HBV infected patients was found to be more than 4.5 folds higher compared to mean viral load in cirrhosis patients.

Our data showed that high viral load was significantly associated with e antigen positive status (p<0.001) in both the chronic HBV and cirrhosis groups.

When correlated with the biochemical profile, HBeAg positivity (p=0.016) and high viral load was associated with higher SGPT levels in chronic HBV cases. The SAP levels were also found to be significantly elevated in both chronic hepatitis (p=0.004) and cirrhosis cases (p=0.022) in e antigen positive groups compared to others.

**Objective 3:** Study the prevalence of different HBV genotypes associated with chronic HBV cases from Northeast India, and study their association with liver disease susceptibility.

- HBV genotyping was studied by multiplex-PCR and/or PCR-direct sequencing method. The overall picture showed that HBV genotype D is the most prevalent genotype (62.30%) in Northeast India.
- Mixed genotype infection of A+D was also found especially from Assam (8.83%), along with C+D cases (1.29%) cumulatively.
- Cases from Manipur, Arunachal Pradesh showed high prevalence of HBV genotype C along with genotype D.
- Cases with HBV genotype C are associated with higher viral load (p=0.018), and e antigen positivity (p=0.043).
- HBV genotype C (OR=1.67) and D (OR=0.762) was found to be associated with increased and decreased cirrhosis risk respectively, compared to chronic HBV cases.
- In the HBeAg positive cases, the HBV genotype A [OR= 2.570, p=0.043] and genotype C [OR=2.039, p=0.087] increased the risk of cirrhosis; while Genotype D was found to be associated with significantly reduced risk of cirrhosis development [OR=0.465 (0.237-0.912) at 95%CI, p=0.023].
To conclude, our results suggest that:

- Family contacts are prone to infection with HBV and development of Chronic HBV.

- As majority of the patients of CHBV and cirrhosis groups were HBeAg positive, it may be inferred that a majority of HBV related liver disease cases in Northeast India belong to a high risk group with a predisposition to chronic HBV related advanced liver diseases like cirrhosis and HCC. Moreover, presence of e negative and anti-HBe negative cases needs special attention, as this type of underlying chronic infection is hard to treat.

- Although HBV genotype D is the most prevalent genotype, the presence of different genotypes including genotype C and mixed genotypes in the ethnically distinct population of north-eastern India is unique. The existence of multiple genotypes is of significance as differences in HBV genotypes significantly influence the heterogeneity in clinical manifestations and even response to antiviral therapy.