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**DETECTION OF HEPATITIS B VIRUS GENOTYPES F AND G ASSOCIATED  
WITH LIVER DISEASE IN TERTIARY HOSPITAL**

**By**

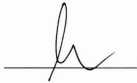
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## **DECLARATION**

I hereby declare that this thesis is my original work and has not been submitted previously or currently for any other degree at UiTM or any other institutions.

A handwritten signature in black ink, consisting of a large loop followed by a series of smaller, connected strokes, positioned above a horizontal line.

(Nabilah Mohd Noor)

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## **ABSTRACT**

### **Detection Of Hepatitis B Genotype F and G Associated With Liver Disease In a Tertiary Hospital**

Hepatitis B virus infection can trigger development of liver disease from acute to chronic hepatitis. Hepatitis B virus genotype is one of the factors that contribute to development of HBV-liver related disease. Ten HBV genotypes have been found which are genotype A through genotype J, with genotype B and C are predominant genotypes in Malaysia. This study was done to identify the hepatitis B genotype F and genotype G in patients with liver disease in a tertiary hospital, and describe the correlation of demographic data as risk factors for hepatitis B virus infection and liver disease. Real-time PCR assay was used in this study to detect presence of HBV genotype F and G in 35 HBV positive serum samples obtained from Kuala Lumpur General Hospital. Among 35 HBV positive samples, 13 samples were positive for genotype F, five samples were positive genotype G, eight samples were positive genotype F and G. Twenty males and 15 females were infected by HBV. In term of ethnic compositions, 17 were Chinese, 11 Malay, one Indian and six from others ethnics in Malaysia. Samples according to age groups, showed the highest infection case reported among patients age between 41 to 60 with frequency 16 out of 35 patients. In conclusion, hepatitis B genotype F was the highest genotype that detected among patient liver disease in tertiary hospital compared to genotype G. This study gives a new insight for the presence of other genotype of HBV among Malaysian. Further investigation should be done with more specific and sensitive method.

**Keywords:** hepatitis B virus, liver disease, genotype, real-time PCR, ethnic

## CHAPTER 1

### INTRODUCTION

#### 1.1 Study background

Hepatitis B virus (HBV) is a family of hepadnaviridae. This virus has a small genome, circular and partially double stranded DNA (Murray *et al.*, 2013). Hepatitis B virus (HBV) can infect human and chimpanzee (Seeger & Mason, 2015). There are 3 types of antigenic components of HBV which are Hepatitis B surface antigen (HBsAg), Hepatitis B core antigen (HBcAg) and Hepatitis B e antigen (HBeAg) (Murray *et al.*, 2013). The main serological marker to determine whether patients are having acute or chronic HBV infection is HBsAg. Hepatitis B e antigen (HBeAg) is a serological marker indicating high viral replication activity (Shepard *et al.*, 2006). Eight genotypes of HBV have been identified through comparison of complete HBV genomes (Alvarado Mora *et al.*, 2011). Genotyping system for HBV is introduced by Okamoto *et al.* Okamoto *et al.* has introduced 4 genotypes groups which are genotype A, B, C and D. Later other researchers have found genotype E, F, G and H (Chee *et al.*, 2006). Recently genotype I as a new genotype has been found using phylogenetic and distance analyses (Alvarado Mora *et al.*, 2011). Studies have reported that genotype A has seven subgenotypes from A1 to A7 (Alvarado Mora *et al.*, 2011). On the other hand, genotypes B, C and D can be divided into 5 subgenotypes which are HBV B1-B5, HBV C1-C5 and HBV D1-D5. As for genotype F, this genotype only has four subgenotypes which are F1-F4 (Jonas & Stoll, 2014).

Hepatitis B virus (HBV) is a virus that will replicate in hepatocytes. Replication in hepatocytes causes disruption to liver function. During replication of the virus, the immune system will activate and specific immune system will attack the infectious agent and as a consequence the liver becomes inflamed (World Health Organization, 2015). Transmission of the HBV can occur through sexual exposure, perinatal, percutaneous and also from close contact between people. Hepatitis B virus (HBV)