MOLECULAR ANALYSIS OF WEAK D TYPE IN CHINESE BLOOD DONOR FROM NATIONAL BLOOD CENTER, MALAYSIA

By

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TABLE OF CONTENTS

ABSTRACT

Molecular Analysis of Weak D Type in Chinese Blood Donor from National Blood Center, Malaysia

Most of studies on molecular basis of weak D have been conducted in Europe, Africa and several countries in Asia. Prevalent of weak D types varies among countries and also populations. Weak D type 15 was predominant in Chinese population in China. Meanwhile, there is limited data regarding weak D type in Chinese population in Malaysia. Therefore, present study was conducted to determine the weak D type in Chinese blood donors from National Blood Centre (NBC), Malaysia by molecular technique of polymerase chain reaction with specific sequence primer (PCR-SSP). A total of nine D-negative blood samples of Chinese blood donors collected from NBC were tested for Rh phenotypes, weak D phenotypes and weak D allele by using molecular technique of PCR-SSP. Rh phenotypes consist of of 4 (45%) of ce, 1 (11%) of Ce, 3 (33%) of Cce and 1 (11%) of cEe. Out of nine D-negative blood samples, two were positive for weak D phenotype. Weak D type 15 was identified from both samples that positive for weak D phenotypes. Cce and cEe were the Rh phenotypes that present with weak D type 15 samples. As a conclusion, weak D type 15 was identified from Chinese blood donors and it is the first type of weak D that observed in Malaysian Chinese.

Keywords: Malaysian Chinese, polymerase chain reaction with specific sequence primers (PCR-SSP), Rh phenotype, Weak D type

CHAPTER 1

INTRODUCTION

1.1 Background of Study

In transfusion medicine, Rh blood group system is clinically important next to ABO because it also causes alloimmunization followed by hemolytic transfusion reaction and hemolytic disease in newborn. Levine et al. (1941) have described the appearance of Rh blood group system through the production of anti-D in pregnant mother caused by transfusion from the husband which resulted in the delivery of a child with erythroblastosis fetalis. Besides, Landsteiner and Wiener have been rewarded for their discovery of Rh antigen of human red cell that reacted with rabbit serum which immunized with red cells of Rhesus monkey.

Rh blood group system is the most complex blood group system because it consists of more than 45 antigens (Avent and Reid, 2000). Rh blood group antigen is encoded by two highly homologous genes, *RHD* and *RHCE* that located in Chromosome 1p36.1 of Rh locus (Cherif-Zahar et al., 1990). D antigen is encoded by *RHD* gene while C or c and E or e are encoded by *RHCE* gene. Normal D antigen or D positive is determined by the presence of a functional and completely normal *RHD* gene (Flegel and Wagner, 2002). While D negative or absence of D antigen is caused by a deletion of *RHD* gene which occurred in most Caucasian, and insertion occurred in exon 4 resulting *RHD* pseudogene (*RHD*Ψ) and hybrid *RHD-CE-D* gene that occurred highly in African (Singleton et al., 2000).