

# DNA SEQUENCE ANALYSIS OF HB-EGF AND CD9 GENES IN DIPHTHERIA CARRIERS AND PATIENTS IN INDONESIA

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**Abstract.** Diphtheria infection is a serious health problem in Indonesia. There is little data regarding the role of human genetic variability on the diphtheria infection. There is also limited information in the literature regarding the comparison between diphtheria patients and carrier state. We aimed to compare the deoxyribonucleic acid (DNA) sequences of heparin binding-epidermal growth factor (HB-EGF) and cluster of differentiation 9 (CD 9) genes between diphtheria carriers and those infected with diphtheria. We searched the databases of the East Java Provincial Health Office and the Main Health Laboratory to identify diphtheria infection patients and carriers aged  $\leq 18$  years during 1 January 2012-30 August 2015. Each study participant was interviewed, had anthropometrical measurements obtained and blood was drawn for DNA sequencing of 2 genes coding for receptors and co-receptors of the diphtheria toxin, HB-EGF and CD9, and antibody titers against *Corynebacterium diphtheriae*. A total of 28 carriers and 97 patients with a history of diphtheria infection during the study period were included in the study. Silent mutations of codon 91 of exon 3 of the HB-EGF gene were found in 5 diphtheria carriers and 21 diphtheria cases, and of codons 171 and 173 of exon 6 of the CD9 gene in 1 carrier and 2 cases. We also found silent mutation of intron 5, position 35719 of the CD9 gene in 16 carriers and 39 cases. Statistical analysis showed no significant differences in the frequencies of mutations of exon 3 of the HB-EGF gene and exons 5 and 6 of the CD9 gene between carriers and cases. However, significantly more carriers had the mutation of intron 5 of the CD9 gene than cases. We concluded the genetic variability of the DT receptors in human was limited.

**Keywords:** diphtheria, carriers and patients, DNA sequence, HB-EGF and CD9 genes, Indonesia

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