

Distribution of HLA-DQA1 and HLA-DQB1 Alleles in Thais: Genetics Database Insight for COVID-19 Severity

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Abstract : Coronavirus, also referred to as COVID-19, is a virus caused by the SARS-Cov-2 virus. The pandemic has caused over 10 million cases and 500,000 deaths worldwide through the end of June 2020. In a previous study, HLA-DQA1*01:02 allele was associated with COVID-19 disease (p-value = 0.0121). Furthermore, there was a statistical significance between HLA-DQB1*06:02 and COVID-19 in the Italian population by Bonferroni's correction (p-value = 0.0016). Nevertheless, there is no data describing the distribution of HLA alleles as a valid marker for prediction of COVID-19 in the Thai population. We want to investigate the prevalence of HLA-DQA1*01:02 and HLA-DQB1*06:02 alleles that are associated with severe COVID-19 in the Thai population. In this study, we recruited 200 healthy Thai individuals. Genomic DNA samples were isolated from EDTA blood using Genomic DNA Mini Kit. HLA genotyping was conducted using the Lifecodes HLA SSO typing kits (Immucor, West Avenue, Stamford, USA). The frequency of HLA-DQA1 alleles in Thai population, consisting of HLA-DQA1*01:01 (27.75%), HLA-DQA1*01:02 (24.50%), HLA-DQA1*03:03 (13.00%), HLA-DQA1*06:01 (10.25%) and HLA-DQA1*02:01 (6.75%). Furthermore, the distributions of HLA-DQB1 alleles were HLA-DQB1*05:02 (21.50%), HLA-DQB1*03:01 (15.75%), HLA-DQB1*05:01 (14.50%), HLA-DQB1*03:03 (11.00%) and HLA-DQB1*02:02 (8.25%). Particularly, HLA-DQA1*01:02 (29.00%) allele was the highest frequency in the NorthEast group, but there was not significant difference when compared with the other regions in Thais (p-value = 0.4202). HLA-DQB1*06:02 allele was similarly distributed in Thai population and there was no significant difference between Thais and China (3.8%) and South Korea (6.4%) and Japan (8.2%) with p-value > 0.05. Whereas, South Africa (15.7%) has a significance with Thais by p-value of 0.0013. This study supports the specific genotyping of the HLA-DQA1*01:02 and HLA-DQB1*06:02 alleles to screen severe COVID-19 in Thai and many populations.

Keywords : HLA-DQA1*01:02, HLA-DQB1*06:02, Asian, Thai population

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