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**Analisis Hubungan Karakteristik Sosiodemografi, Profil Genotipe, Ekspresi Protein Toll-Like Receptor
3 dan Toll-Like Receptor 7 serta Respon IFN-alfa dengan Infeksi Dengue**
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ABSTRAK

Latar belakang: Beberapa penelitian menunjukkan hubungan variasi genetik dari gen terkait sistem imun dengan suseptibilitas pada dengue, salah satunya adalah TLR. Variasi genetik pada TLR dapat mempengaruhi perannya dalam memicu sistem imun untuk mengatasi dengue. Selain faktor genetik, terdapat juga faktor lain yang dapat mempengaruhi dengue yaitu faktor sosiodemografi.

Tujuan: Penelitian ini dilakukan untuk mengetahui profil genotipe, ekspresi protein TLR 3 dan TLR7 serta melihat pengaruhnya pada respon inang terhadap infeksi dengue. Respon inang yang dilihat adalah ekspresi IFN-α. Selain itu akan dipelajari pengaruh faktor sosiodemografi terhadap terjadinya infeksi dengue.

Metode: Penelitian menggunakan desain *case control*. Analisis faktor sosiodemografi didapat dengan pemberian kuesioner. Analisis faktor genotipe dilakukan dengan metode Taqman SNP *genotyping assay*. Analisis protein TLR3, TLR7 dan IFN-α dilakukan dengan metode ELISA.

Hasil: Pada kasus dan kontrol terdapat perbedaan signifikan untuk variabel BMI, pendapatan tingkat pendidikan dan pekerjaan. Frekuensi genotipe TLR 3 rs3775290, TLR3 rs3775291 dan TLR7 rs3853839 tidak berbeda secara signifikan antara kelompok kasus dan kontrol. Frekuensi genotipe TLR3 rs3775291 berbeda antara penderita DF dan DHF pada model genetik codominan dan overdominan Ekspresi protein TLR3 dan TLR7 secara signifikan lebih tinggi pada kasus dibandingkan kontrol. Ekspresi protein TLR3 dan TLR7 berhubungan secara positif dengan ekspresi IFN-α.

Kesimpulan: Karakteristik sosiodemografi berhubungan dengan terjadinya infeksi Dengue**.** Perbedaan profil genotipe ditemukan pada TLR3 rs3775291 antara kelompok DF dan DHF pada model genetik codominan dan overdominan. Ekspresi protein TLR3 dan TLR7 berbeda antara penderita dengue dengan kontrol**.** Ekspresi protein TLR3 dan TLR7 berhubungan dengan ekspresi IFN-α sebagai respon inang terhadap infeksi dengue.

Kata kunci: infeksi dengue, variasi genetik, TLR 3, TLR7, IFN-α

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ABSTRACT

Introduction: Numerous studies have established a connection between genetic variations in immune system-related genes and susceptibility to dengue, particularly regarding Toll-like receptors (TLRs). These genetic variations in TLR may affect how the immune system is activated to combat dengue infection. In addition to genetic factors, sociodemographic factors can also play a role in influencing dengue susceptibility.

Objective: This study aimed to determine the genotype profiles and the expression of TLR3 and TLR7 proteins, as well as to examine their impact on the host's response to dengue infection, particularly regarding the expression of IFN-α. Additionally, the research investigates how sociodemographic factors influence the occurrence of dengue infections.

Methods: The study utilized a case-control design. Sociodemographic factors were analyzed through questionnaires. We conducted genotype analysis using the TaqMan SNP genotyping assay. Levels of TLR3, TLR7 and IFN-α proteins were measured by ELISA.

Result: Significant differences were observed between the case and control groups in term of body mass index (BMI), income, education level and occupation. However, the genotype frequencies for TLR3 rs3775290, TLR3 rs3775291 and TLR7 rs3853839 did not show any significant differences between these groups. Notably, the genotype frequency of TLR3 rs3775291 varied between patients with dengue fever (DF) and those with dengue hemorrhagic fever (DHF) under both codominant and overdominant genetic models. Additionally, the protein expression levels of TLR3 and TLR7 were significantly higher in the case group compared to the controls. There was also a positive correlation between the expression levels of TLR3 and TLR7 and the expression of IFN-α.

Conclusion: Sociodemographic characteristics are associated with the occurrence of dengue infection. Differences in TLR3 rs3775291genotype profiles were observed between the Dengue Fever (DF) and Dengue Hemmorhagic Fever (DHF) groups, based on both codominant and overdominant genetic models. Additionally, the expression of TLR3 and TLR7 proteins varied between dengue patients and healthy controls. The expression levels of TLR3 and TLR 7 proteins are associated with the production of IFN-α, which is a host response to dengue infection.

Keywords: dengue infection, genetic variation, TLR3, TLR7, IFN-α.