Studi polimorfisme gen pengkode Plasmodium vivax Duffy Binding Protein II (PvDBP II) dari subjek penderita malaria vivax di Kabupaten Mimika, Papua

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Abstrak

Invasi Plasmodium vivax (Grassi & Filetti, 1889) ke dalam retikulosit ditentukan oleh adanya interaksi antara ligan PvDBP II dan reseptor Duffy Antigen Receptor for Chemokines (DARC) pada permukaan sel darah merah. Penelitian bertujuan mengkarakterisasi polimorfisme pada gen pengkode PvDBP II dari isolat P. vivax di Kabupaten Mimika, Papua dan menentukan asam amino yang conserved. Gen pengkode PvDBP II diamplifikasi dari 12. Hasil amplifikasi gen pengkode PvDBP II kemudian diklona dan dilakukan sequencing pada 43 klona yang positif. Mutasi synonymous ditemukan pada 15 kodon asam amino (20%), sedangkan mutasi nonsynonymous terjadi pada 58 kodon asam amino (77,3%). Sebagian besar mutasi (78,6%) terletak pada critical binding motif PvDBP II. Rekonstruksi pohon filogenetik menggunakan metode Bayesian, memperlihatkan adanya hubungan kekerabatan antara isolat Indonesia dan isolat dari negara lain. Kesimpulan dari penelitian adalah polimorfisme pada isolat Indonesia sangat tinggi (81,4%) dan asam amino sistein adalah asam amino yang conserved (83,3%).

.....The interaction between PvDBP II and its receptor, the Duffy antigen receptor for chemokines (DARC) is essential for the merozoite invasion into the reticulocytes. This study aimed to characterize the genetic polymorphisms of the gene encoding the PvDBP II in isolates from Mimika district, Papua. The gene encoding the PvDBP II from 12 isolates was subjected to PCR amplification and the patterns of polymorphisms were characterized using DNA cloning. Fourty three clones were further examined by sequencing. Fifteen synonymous (20%) and 58 nonsynonymous (77,3%) mutations were identified. The highest frequency of polymorphisms (78,6%) was found in critical binding motif of PvDBP II. Phylogenetic analysis of DNA sequences using Bayesian methods demonstrated that P. vivax (Grassi & Filetti, 1889) isolates from Indonesia were related with other isolates from different geographical regions. The conclusions of this study are the level of polymorphisms in Indonesian isolates is high (81,4%) and cysteine residues are conserved (83,3%).