ABSTRAK

Latar belakang: Protein permukaan merozoit (MSP1-19) dikaitkan dengan invasi sel darah merah dan memicu respons imun seluler dan humoral. Data respon imun berhubungan dengan manifestasi klinis, reinfeksi dan kepadatan parasit masih terbatas di Indonesia. Penelitian ini bertujuan untuk mengetahui apakah antigen rekombinan PfMSP1-19 dan PvMSP1-19 yang diekspresikan oleh *Bombyx mori* dapat mendeteksi IgG anti PfMSP1-19 dan IgG anti PvMSP1-19 serta hubungan IgG anti PfMSP1-19 dan IgG anti PvMSP1 dengan kepadatan parasit, manifestasi klinis malaria falciparum di Pulau Sumba Propinsi Nusa Tenggara Timur yang merupakan daerah endemik malaria.
Metode: Tiga ratus tujuh puluh satu pasien suspek malaria diamati dan dikonfirmasi secara mikroskopis sebagai *P. falciparum* (299), *P. vivax* (57), *P. malariae* (7), campuran *P. falciparum* + *P. vivax* (6), dan negatif (2). Selanjutnya pemeriksaan mikroskopis pada minggu ke 12, 24, 36 dan reinfeksi dilakukan terhadap 38, 30, dan 28 responden vivax dan 95, 83, dan 46 responden falciparum. Pemeriksaan serologis pada H0, minggu ke 12, 24 dan 36 serta saat reinfeksi masing-masing dilakukan terhadap 55, 28, 28, 28 sampel serum vivax dan 24, 14, 14, 14 serum falciparum. Hanya sampel serum monoinfeksi falciparum dan vivax (dikonfirmasi secara mikroskopis) diuji serologis. Kriteria eksklusi yaitu malaria campuran, ovale dan malariae, kehamilan, terapi DHP yang tidak adekuat, tidak ada tes darah paska terapi malaria, pindah domisili dan sampel yang dikumpulkan tidak lengkap (kurang dari 36 minggu). Kepadatan parasit dihitung dalam slide darah tebal. Titer IgG anti PfMSP1-19 dan IgG anti PvMSP1-19 diukur dengan ELISA. Kemampuan antigen rekombinan PfMSP1-19 dan PvMSP1-19 deteksi IgG anti PfMSP1-19 dan IgG anti PvMSP1-19 dilakukan uji aglutinasi, optimasi dengan *checkerboard* dan pengukuran *cut off.* Kinetika titer IgG anti PfMSP1-19 dan IgG anti PvMSP1-19 selama 36 minggu, dianalisis secara deskriptif. Hubungan titer IgG anti PfMSP1-19 dan IgG anti PfMSP1-19 dengan manifestasi klinis dianalisis dengan regresi logistik. Hubungan titer IgG anti MSP1-19 dengan reinfeksi dianalisis dengan *chi-square* dan korelasi titer IgG anti MSP1-19 dengan kepadatan parasit dianalisis dengan uji Spearman.
Hasil: Antigen rekombinan PfMSP1-19 dan PvMSP1-19 yang diekspresikan pada *B. mori* mampu mendeteksi IgG anti PfMSP1-19 dan IgG anti PvMSP1-19. Titer IgG anti PvMSP1-19 bertahan pada minggu ke-12 selanjutnya menurun hingga akhir pengamatan, sedangkan titer IgG anti-PfMSP1-19 menurun hingga akhir pengamatan. Titer IgG anti-PvMSP1-19 yang tinggi berhubungan dengan manifestasi klinis ringan, tetapi berbeda pada titer IgG anti-PfMSP1-19 tidak berhubungan dengan manifestasi klinis. Titer IgG anti PvMSP1-19 dan IgG anti PfMSP1-19 tidak berhubungan dengan kepadatan parasit dan reinfeksi.
Kesimpulan: Ada hubungan IgG anti PvMSP1-19 dengan manifestasi klinis namun pada IgG anti PfMSP1-19 tidak ada hubungan.

Kata kunci: rekombinan PfMSP1-19 dan PvMSP1-19, malaria, manifestasi klinis, kepadatan parasit, reinfeksi

ABSTRACT

Background: Merozoite surface protein (MSP1-19) is associated with red blood cell invasion and triggers cellular and humoral immune responses. Data on immune responses associated with clinical manifestations, reinfection and parasite density were limited in Indonesia. This study aims to investigate whether recombinant antigens PfMSP1-19 and PvMSP1-19 expressed by Bombyx mori can detect IgG anti PfMSP1-19 and IgG anti PvMSP1-19 and the association of IgG anti PfMSP1-19 and IgG anti PvMSP1 with parasite density, clinical manifestations of falciparum malaria in Sumba Island, East Nusa Tenggara Province which is a malaria endemic area. **Methods:** Three hundred and seventy-one suspected malaria cases were observed and microscopically confirmed as P. falciparum (299), P. vivax (57), P. malariae (7), mixed P. falciparum + P. vivax (6) and negative (2). In addition, microscopic examinations were performed at weeks 12, 24, 36 and reinfection in 38, 30 and 28 vivax and 95, 83 and 46 falciparum subjects, respectively. Serological examinations at the time of illness, weeks 12, 24 and 36 and reinfection were performed on 55, 28, 28, 28 vivax and 24, 14, 14, 14 falciparum serum samples, respectively. Only monoinfected (microscopically confirmed) falciparum and vivax serum samples were serologically tested. Exclusion criteria were mixed malaria, ovale and malariae, pregnancy, inadequate DHP therapy, no post-treatment blood test, moving and incomplete sample collection (less than 36 weeks). Parasite densities were calculated in thick blood smears. Anti-PfMSP1-19 IgG and anti-PvMSP1-19 IgG titres were measured by ELISA. Agglutination tests, checkerboard optimisation and cut-off measurements were performed to determine the ability of recombinant PfMSP1-19 and PvMSP1-19 antigens to detect anti-PfMSP1-19 Ig and anti-PvMSP1-19 IgG. Descriptive analysis was performed on the titer kinetics of anti PfMSP1-19 IgG and anti PvMSP1-19 IgG over 36 weeks. Logistic regression was used to analyse the association of anti-PfMSP1-19 IgG and anti-PvMSP1-19 IgG titres with clinical manifestation. Chi-Square test was used to analyse the association of anti-PfMSP1-19 IgG and anti-PvMSP1-19 IgG titres with reinfection, and Spearman's test was used to analyse the correlation of anti-PfMSP1-19 IgG and PvMSP1-19 titres with parasite density. **Results:** Recombinant MSP1-19 antigens expressed on *Bombyx. mori* was able to detect anti-MSP1-19 IgG. Anti-PvMSP1-19 IgG titer persisted until the 12th week and then decreased until the end of the observation period, whereas anti-PfMSP1-19 IgG titer decreased until the end of the observation period. High anti-PvMSP1-19 IgG titer was associated with mild clinical manifestations, whereas anti-PfMSP1-19 IgG titer was not. Anti-PvMSP1-19 IgG and anti-PfMSP1-19 IgG titres were not associated with parasite density and reinfection. **Conclusion**: There is an association of IgG anti PvMSP1-19 with clinical manifestations, but no association with IgG anti PfMSP1-19.

Keywords: recombinant antigen, PfMSP1-19, PvMSP1-19, malaria, clinical manifestations, parasite density, reinfection