Kinetika Respons Imun Humoral Pasca Pemberian Vaksin COVID-19 Platform Virus Utuh dan Vektor Virus: Studi Longitudinal pada Orang Dewasa = Kinetics of Humoral Immune Response After COVID-19 Vaccination with Inactivated and Viral Vector Platforms: A Longitudinal Study in Adults

Khariri, author

Abstrak

Pandemi COVID-19 telah menimbulkan tantangan global dalam menghadapi penyebaran virus SARS-CoV-2. Vaksinasi menjadi strategi efektif dalam mengurangi penyebaran virus dan dampak COVID-19 pada kesehatan masyarakat. Platform vaksin yang banyak diberikan di Indonesia antara lain platform virus utuh dan vektor virus. Penelitian ini bertujuan menganalisis imunitas humoral pasca vaksinasi COVID-19 platform virus utuh dan vektor virus pada orang dewasa. Desain penelitian ini adalah longitudinal dengan pengambilan sampel secara berkala sebanyak 6 kali sebelum dan setelah vaksinasi. Penelitian dilakukan pada tahun 2021 sampai 2023 di Kota Bogor dan Kabupaten Sleman. Jumlah subjek yang terlibat sebanyak 150 orang pada setiap kelompok. Pengumpulan data dilakukan melalui wawancara dan pengambilan sampel serum. Serum diperiksa untuk binding antibody menggunakan CMIA, antibodi netralisasi menggunakan SvNT, subkelas IgG menggunakan ELISA, dan mediator imunitas seluler menggunakan multipleks ELISA. Dari hasil pemeriksaan laboratorium pada sampel TP1 didapatkan sebanyak 42% subjek vaksin virus utuh dan 81% subjek vaksin vektor virus positif antibodi SARS-CoV-2. Di antara subjek yang positif mempunyai riwayat gejala sesak napas (100%), demam (89%) dan pilek (82%). Subjek vaksin vektor virus mempunyai tren respons antibodi lebih tinggi dibanding virus utuh. Proporsi subjek positif pada pengukuran antibodi netralisasi selalu lebih tinggi dibanding binding antibody. Berdasarkan imunosenescence, secara umum tidak berbeda bermakna di antara kelompok usia tersebut. Faktor yang secara signifikan memengaruhi respons imun dalam adalah platform vaksin. Respons antibodi tidak berbeda bermakna pada subjek yang mendapatkan vaksin 2 dan 3 dosis, baik pada hasil pengukuran TP1 positif maupun negatif. Pemberian dosis 3 heterolog menimbulkan respons antibodi yang lebih tinggi dibandingkan dengan homolog. Analisis statistik pada kedua kelompok penerima vaksin menunjukkan tidak berbeda bermakna pada semua subkelas IgG. Kadar IFN gamma, IL-2, IL-6, IL-10 dan TNF alpha pada virus utuh lebih rendah dibandingkan vektor virus Hasil penelitian menunjukkan bahwa kedua platform vaksin mampu menginduksi respons antibodi yang signifikan. Namun, terdapat perbedaan dalam pola dan durasi respons imun antara kedua jenis vaksin. .....The COVID-19 pandemic has become a global challenge with the spread of SARS-CoV-2. Vaccination is an effective strategy to reduce the spread of the virus and the impact of COVID-19 on public health. The research aims to analyse humoral immunity following vaccination with COVID-19 viral platforms and viral vectors in adults. The study design is longitudinal, with samples taken periodically up to 6 times before and after vaccination. The study will be conducted between 2021 and 2023 in Bogor City and Sleman District. The number of subjects involved is 150 people in each group. Data will be collected through interviews and serum sampling. Serum was tested for antibody binding using CMIA, antibody neutralisation using SvNT, subclass IgG using ELISA, and cellular immunity mediators using ELISA multiplex. Laboratory testing of the TP1 sample showed that 42% of the whole inactivated vaccine subjects and 81% of the viral vector

subjects were positive for SARS-CoV-2 antibodies. Those who were positive had a history of shortness of breath (100%), fever (89%) and colds (82%). The proportion of positive subjects in the neutralised antibody measurement is always higher than the antibody binding. Based on immunosenescence, there is generally no difference in significance between these age groups. The factor that significantly affects the immune response within the vaccine is the vaccine platform. The antibody response was not significantly different in subjects who received 2 and 3 doses of the vaccine, both in positive and negative TP1 measurements. The administration of 3 heterologous doses results in a higher antibody response compared to homologous doses. Statistical analysis in both groups showed no significant difference in all IgG subclasses. IFN gamma, IL-2, IL-6, IL-10 and TNF-alpha levels were lower in the whole inactivated vaccine than in in the viral vector. However, there are differences in the pattern and duration of immune responses between the two vaccines.