MINIMAL LEUKOCYTES PHENOTYPING PANEL IN PATIENTS WITH COVID-19

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SARS-CoV-2 causes dysregulation of immune response associated with unpredictable clinical course. Multiparameter flowcytometry is the most accessible method for immune monitoring.

Aim. Evaluation of minimal flow cytometry panel for monitoring of SARS-CoV-2 infection, including the major T lymphocyte populations and activated subsets.

Material and methods. Blood samples from COVID-19 patients (n=69) aged 50 (18-80) years were studied. The absolute numbers (AC) and percentages of lymphocyte subpopulations were determined by flow cytometry using CD3/CD8/CD45/CD4, CD8/CD38/CD3/HLA-DR and standard TRUCount tubes (BD Biosciences, FACSCanto II). Specific IgA and IgG antibodies were determined by Anti-SARS-CoV-2 ELISA (Euroimmun).

Results. 42 men and 27 women with mild/moderate symptoms were tested 6±4 days after the positive PCR. Men were significantly younger (mean 46 vs. 57y respectively, $p<0.05$). The AC and percentage of total T (CD3+CD19-), Th (CD3+CD4+), Tc (CD3+CD8+) as well as the CD4/CD8 index did not differ significantly from the reference values. CD38+, HLA-DR+, CD38+/HLA-DR+CD4 or CD8T shares were significantly increased: 22.5vs.14.8, 3.7vs.1.7, 2.1vs.0.7 and 6.8vs.2.8, 3.1vs.1.0, 2.0vs.0.4, ($p<0.05$ for all). The percentage of CD38+CD4 and CD38+CD8T decreased after the 14th day (24.7vs.19.7, $p<0.038$; 9.7vs.5.2,$p<0.05$). HLA-DR+CD8+T correlated with IgG levels ($R=0.55$, $p<0.001$). Patients <50y of age were characterized with higher proportion and AC of CD8T (25vs.19%, $p<0.01$; 430vs.299cells/µl, $p<0.05$), lower CD4/CD8 ratio (1.9vs.2.6, $p<0.01$), and a higher share of CD38+CD4 and CD8T (25vs.20% and 11vs.6.0%, $p<0.01$ for both) regardless of the infection duration. In younger patients, the share of CD38+CD4 and CD8T correlated inversely with SARS-CoV-2IgA ($R=-0.50$, $p<0.05$, for both).

Conclusions. CD38+/HLA-DR+CD4 and CD8T are sensitive age-related parameters for immune monitoring of COVID-19. The pathogenetic significance of each activated subset needs to be clarified, especially in the context of the published data on the suppressive effect of a CD38+CD8T.