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DECREASED EXPRESSION OF CD4$^+$CD25$^+$ TREG ON PERIPHERAL BLOOD MONONUCLEAR CELLS IN PATIENTS WITH ACUTE CORONARY SYNDROME

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Objectives To investigate the expression and function of CD4$^+$CD25$^+$ Treg on PBMCs in patients with acute coronary syndrome (ACS).

Methods There were 48 patients with ACS and 12 control subjects. Patients were classified into ST-segment elevation myocardial infarction (STEMI) patients (n=20), non-ST-segment elevation myocardial infarction (NSTEMI) patients (n=15), and unstable angina (UA) patients (n=13). Peripheral blood were collected from all subjects in a fasting state. PBMCs were prepared by Ficoll density gradient for analysis of flow cytometry (FCM). Serum was obtained after centrifugation and stored at −80°C until further use. For the analysis of Treg cells, cells surface staining was performed by the use of CD4-prep, CD25-FITC, foxp3-APC, and CTLA4-PE. Stained cells were assessed by FCM. The frequency of Treg (CD4$^+$CD25$^+$, CD4$^+$CD25$^+$Foxp3$^+$ and CD4$^+$CD25$^+$ CTLA4$^+$) cells was expressed as a percentage of CD4$^+$ T cells by sequential gating on lymphocytes and CD4$^+$ T cells. The levels of TGF-β1 in serum were examined by ELISA. Values were expressed as the mean±SD. Data were analysed by using SPSS 11.0. Statistical significance for the difference in the groups was assessed by one-way analysis of variance (ANOVA). $p<0.05$ was considered to be statistically significant.

Results There were no significant differences in age, gender, hypertension, diabetes mellitus, smoking rate, obesity among STEMI, NSTEMI, UA patients and the control. The frequencies of Treg cells were significantly lower in STEMI, NSTEMI, and UA patients than in the control [CD4$^+$CD25$^+$/CD4$^+$: 2.5±0.7 (%), 3.3±0.6, 3.5±0.5, 5.8 ±0.6 (all $p<0.05$ vs control); CD4$^+$CD25$^+$Foxp3$^+$/CD4$^+$: 1.7±0.5, 2.5±0.4, 3.2±0.4, 3.9±0.5 (all $p<0.05$ vs control); CD4$^+$CD25$^+$CTLA4$^+$/CD4$^+$: 0.9±0.3, 1.5±0.3, 1.6±0.4, 2.3±0.5 (all $p<0.05$ vs control)]. These in the STEMI patients were also markedly lower than in the NSTEMI, and UA patients (all $p<0.05$). The levels of TGF-β1 were significantly lower in in STEMI, NSTEMI, and UA patients than in the control [6.8±1.8 (pg/ml), 14.9±1.5, 15.1±2.2, 25.3±3.4 (all $p<0.05$ vs control)]. These in the STEMI patients were also markedly lower than in the NSTEMI, and UA patients (all $p<0.05$).

Conclusions The peripheral CD4$^+$CD25$^+$, the frequency of Foxp3, CTLA4 on CD4$^+$CD25$^+$ Treg cells, and serum concentration of TGF-β1 in patients with ACS were decreased. It suggested that the fall of expression and function of CD4$^+$CD25$^+$ Treg may contribute to the occurrence of ACS.