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Clinical implications of high Qa/CO in hemodialysis patients

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Objectives: The clinical implication for high access flow(Qa)/ cardiac output(CO) is not well known in patient with hemodialysis (HD). The purpose of this study was to analyze clinical implications by comparing the characteristics of Qa/CO at baseline and 1 year later.

Methods: We performed an observational study of prevelant HD patients. Patients were divided into two groups according to Qa/CO of 0.3. We measured CO, Qa, brachial artery flow, and volume status. In addition, we analyzed and compared changes in Qa/CO and related parameters after 1 year later.

Results: The number of patients with a Qa/CO value of 0.3 or higher was 27 out of 133(20.3%) patients. Qa (2.00 ±0.51 vs. 0.95±0.34 L/min, $p < 0.001$), diastolic blood pressure(DBP) (74.2 ±15.6 vs. 67.0±14.4 mmHg, $p = 0.023$), end diastolic velocity (EDV) (137.0±48.2 vs. 99.8±42.1 cm/s, $p < 0.001$) and diameter (0.60±0.13 vs. 0.53±0.10 mm, $p = 0.002$) of brachial artery were higher, but CO (4.99±1.25 vs. 5.85±1.58 L/min, $p = 0.01$) were significantly lower than those of group with Qa/CO less than 0.3. There was a significant higher Qa/CO in patients with non-diabetes($p=0.037$) and upper access($p < 0.001$). In the multivariate analysis, upper access (odds ratio [OR], 3.882; 95% confidence interval [CI] 1.301−11.579) DBP (OR, 1.048; 95% CI 1.010−1.088), and EDV (OR, 1.020; 95% CI, 1.008−1.033) were independent risk factors for high Qa/CO. The Qa decreased (2.00 ±0.51 vs. 1.66±0.63 L/min, $p = 0.002$) but CO (5.80±1.52 vs. 6.23±2.64 L/min, $p = 0.013$) increased significantly in the group with higher Qa/CO patients.

Conclusions: Patients with high Qa/CO had lower CO than that of normal Qa/CO. The upper access, DBP and EDV are significant risk factors for high Qa/CO. The Qa decreased but CO increased after one year later. More research is needed to find out the clinical significance of changes in Qa and CO.