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The relationship of residual renal function with cardiovascular morbidity in hemodialysis patients and the potential role of monocyte chemoattractant protein-1

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Background: Residual renal function (RRF) provides several benefits to patients in dialysis. Monocyte chemoattractant protein-1 (MCP-1) plays an important role on atherosclerotic lesions. We considered the relationship between residual renal function and cardiovascular morbidity and the significant role of MCP-1 serum concentrations in hemodiafiltration patients.

Methods: We enclosed 76 patients in on-line hemodiafiltration. RRF was defined by interdialytic urine output and we studied the patients in two groups according to the preservation or not of urine output. MCP-1 levels were measured using ELISA. Chi-square tests were applied for the association between RRF and left ventricular hypertrophy (LVH), coronary artery disease (CAD), peripheral arterial disease (PAD), systolic and diastolic cardiac dysfunction. We built an adjusted model using logistic regression analysis for the factors which could impact on the loss of urine output.

Results: Chi-square tests showed significant association between the loss of urine output and LVH, diastolic dysfunction and PAD ($\chi^2=7.4$, $p=0.007$, $\chi^2=14.3$, $p=0.001$, $\chi^2=4.2$, $p=0.03$ respectively), although the association with CAD and systolic dysfunction was found non-significant. The patients without RRF had significantly higher MCP-1 and the urine volume was inversely associated with MCP-1 ($r=-0.465$, $p=0.03$). In the built adjusted model the elevated MCP-1 was found to be a significant predictor for the loss of residual renal function.

Conclusion: The loss of residual renal function was significantly associated with left ventricular hypertrophy, diastolic dysfunction and peripheral arterial disease in hemodiafiltration patients. The affected by the lack of urine increased MCP-1 may act as an additional underlying factor on this relationship reflecting a progressive inflammation/oxidative stress condition.

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