MCP-1 INTRAPERITONEAL PRODUCTION IS ASSOCIATED WITH THE PERITONEAL DIALYSIS ADEQUACY AND IT`S SURVIVAL

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OBJECTIVES

Nowadays, technical innovations have significantly increased the duration of peritoneal dialysis (PD) treatment. However, peritoneal membrane function is impaired according to the peritoneal fibrosis (PF) progression in PD patients, that leads to ultrafiltration and technique failure. Recent clinical and experimental studies have demonstrated the crucial role of monocyte chemoattractant protein -1 (MCP-1) high production in the PF. But, the relationship problem of the intraperitoneal production of MCP-1 to PD adequacy has never been investigated before.

The present study was undertaken to investigate the peritoneal dialysis effluent (PDE) level of MCP-1 and its potential effects on PD adequacy and technical survival.

METHODS

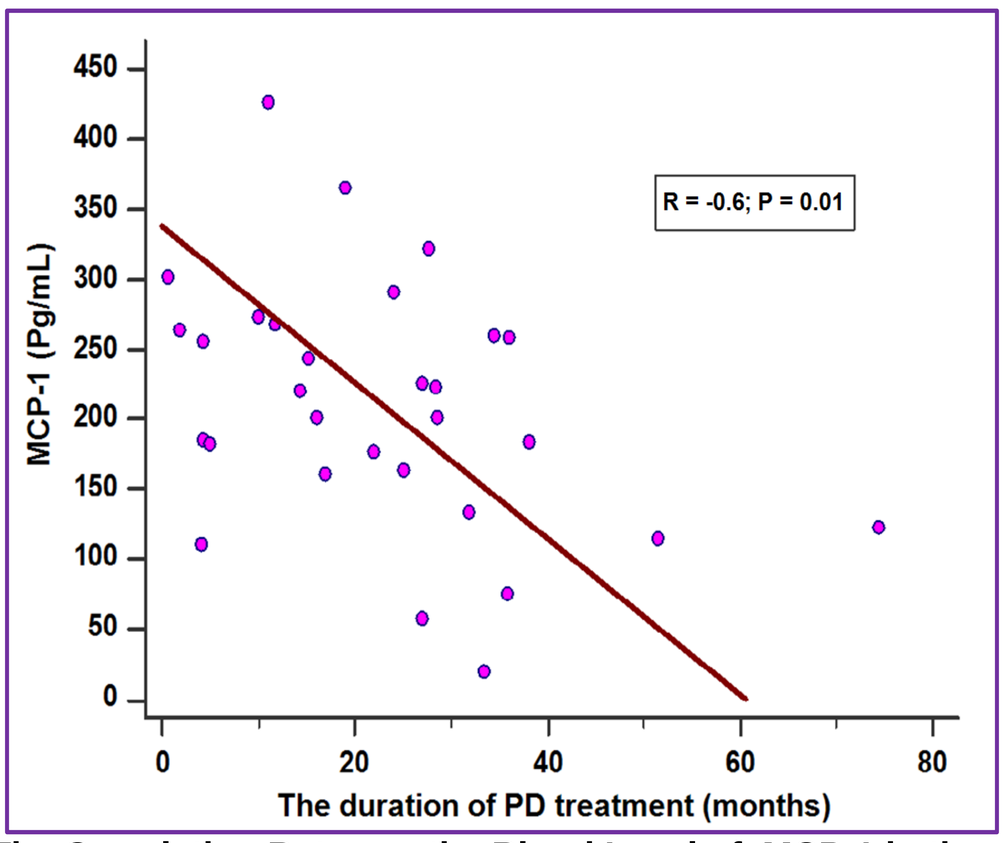
In this prospective observational study, the associations between the intraperitoneal production of MCP-1 and the indicators of dialysis adequacy in 18 non-diabetic PD patients (average age 50.8 ± 12.5) were analysed. All the patients had been undergoing continuous ambulatory PD (CAPD) for more than 3 months. They were observed during a period of 36 months to determine the impact of MCP-1 on the dialysis adequacy. The concentration of MCP-1in PDE was analyzed using ELISA.

The adequacy of dialysis was determined by measuring the total weekly creatinine clearance (CrCl) (which was normalized to 1.73 m2 of the body surface area) and total weekly urea clearance (Kt/V) using the Watson formula for body water. Peritoneal Kt/V and renal Kt/V were estimated separately. The dialysate/plasma creatinine ratio (D/P) was calculated from the concentrations of creatinine in the 24-h dialysate and the plasma. For the statistical analysis, we used the Student's t-test, nonparametric (U-test) Mann-Whitney and Pearson's rank correlation test. The average values (M) and standard deviation (SD) or the median (Me) and interquartile ranges [Q25; Q75] were calculated according to a normal distribution. PD technique failure was defined as discontinuation of PD due to uncontrolled volume overload with 2.5% dextrose solution or decrease of total weekly Kt/V less than 1.7. Univariate Cox regression models were used to determine the association between PDE levels of MCP-1 and time to PD technique failure. All the statistical analyses were performed using MedCalc.

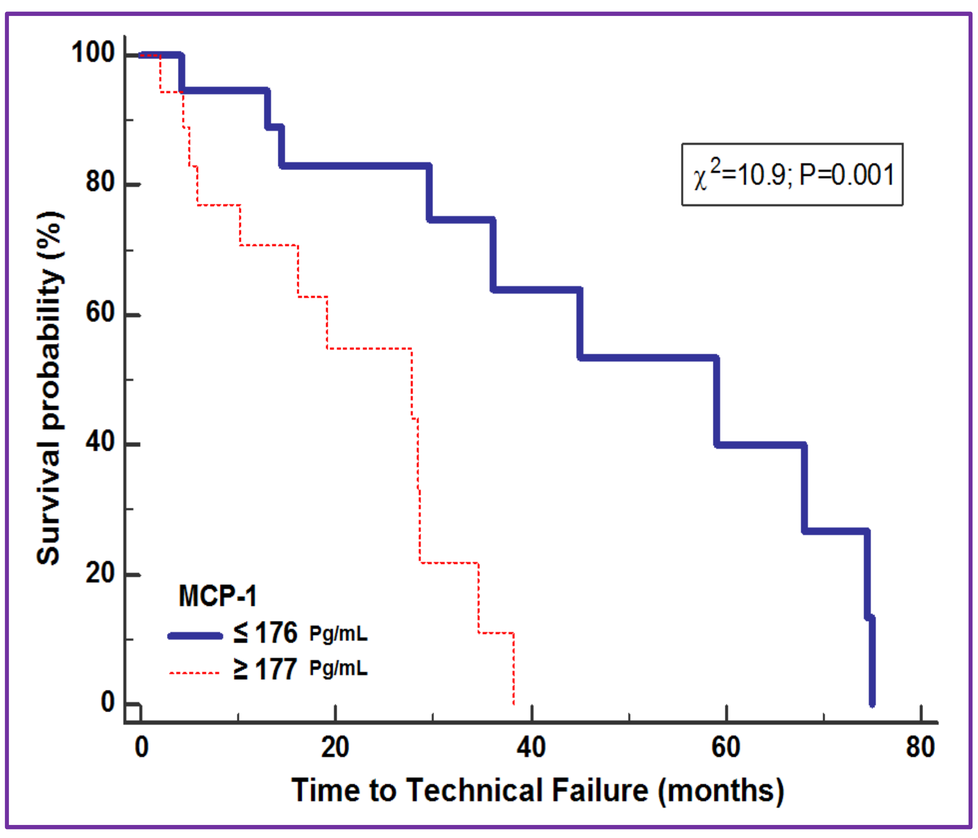
RESULTS

The PDE levels of MCP-1 among the patients with total weekly Kt/V≤1.7 were significantly higher compared to the patients with adequate PD (Kt/V ≥ 1.7: 31.3 [23.1-37.8] vs 14.6 [12-25.6] pg/ml (P=0.008). PDE levels of MCP-1 were directly correlated with D/P creatinine ratio (r = 0.89, p < 0.0001) and inversely correlated with renal Kt/V (r = −0.5, p = 0.05), total weekly Kt/V (r = −0.72, p = 0.001), ultrafiltration volume (r = −0.52, p = 0.03), and duration on PD (r = −0.6, p = 0.01).

Patients with MCP-1 levels above the median had lower technique survival than patients with levels below the median (hazard ratios 7.7, p = 0.02) in univariate Cox regression analysis (log-rank test: $\chi 2 = 10.9$, P = 0.001).



The Correlation Between the Blood Level of MCP-1 in the PD-patients and the Duration of Dialysis Treatment



Kaplan–Meier Technique Survival Curves in PD-patients Dichotomized According to the Serum MCP-1 Level

CONCLUSIONS

The results of this study have provided the preliminary evidence that the PDE level of MCP-1 is significantly associated with PD adequacy and technique survival, and can serve as surrogate marker of peritoneal deterioration. But, further, well-designed clinical trials are required to establish the impact of dialysate MCP-1 on the PD adequacy and technical survival.

References

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