Middle molecular uremic substances retention itself might influence the bioincompatibility of PD solution

To the Editor: It was demonstrated that a higher peritoneal membrane solute transport rate is associated with a higher mortality risk and a trend to higher technique failure. It has been suggested that the bioincompatible nature of conventional peritoneal dialysis (PD) solutions contributes to the structural peritoneal membrane changes that lead to deterioration in solute transport characteristics and loss of ultrafiltration.

However, Fan et al. reported that the clinical outcomes (residual kidney function, peritoneal membrane function, technique survival, and peritonitis rates) were the same, irrespective of standard or biocompatible PD solutions. In the HEMO dialysis study, it became apparent that serum \( \beta_2 \) microglobulin (\( \beta_2M \)) levels, not \( K_t/V \), were the strong predictors of mortality. It was reported that the clearance of \( \beta_2M \) by hemodialysis (when high-flux membranes were used) was higher than that by PD.

We stained peritoneal tissue from continuous ambulatory peritoneal dialysis (CAPD) patients \( (n = 19) \) for \( \beta_2M \) (rabbit anti-human \( \beta_2M \); DAKO, Glostrup, Denmark). In almost all the patients, deposits of \( \beta_2M \) were found in the compact zone (Figure 1). We previously investigated the associations of predictors of mortality. It was reported that the clearance of \( \beta_2M \) by hemodialysis was higher than that by PD.

Even though no difference was observed in the total daily \( \beta_2M \) clearance. We also reported that \( \beta_2M \) is useful as a screening test for the onset of encapsulating peritoneal sclerosis and that the accumulation of both \( \beta_2M \) and middle molecular uremic substances may be related to the pathophysiology of encapsulating peritoneal sclerosis.

\( \beta_2 \) Microglobulin may have a pathogenic role, which is unproven; however still, if middle molecular uremic substance retention itself influences the bioincompatibility of PD solution, it might be worthwhile to attempt combined continuous ambulatory peritoneal dialysis and hemodialysis treatment in patients with high \( \beta_2M \) levels for whom sufficient clearance cannot be maintained with continuous ambulatory peritoneal dialysis alone, but this also requires further study. We should not pay attention only to PD solution but also to middle molecular uremic substance retention.

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Figure 1 | \( \beta_2M \) staining in peritoneal tissue from CAPD patients.

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