Elevation of Interleukin 6 in the Dialysate Reflects Peritoneal Stimuli and Deterioration of Peritoneal Function

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Dear Sir,

Deterioration of peritoneal function, in which inadequate ultrafiltration is usually present, is a serious complication of long-term CAPD patients. At present, however, no simple means to evaluate peritoneal function have been established. Interleukin 6 (IL-6) is secreted in vitro by peritoneal mesothelial cells [1], and a very high EL-6 concentration in the CAPD effluent was associated with increased permeability of the peritoneum [2]. Therefore, we measured dialysate IL-6 and discussed the relationship between IL-6 and peritoneal function. Peritoneal function was evaluated by peritoneal function

index (PFI), which was the ratio of ultrafiltration volume (ml) to dialysate osmotic pressure (mosm) [3]. As shown in figure 1, a negative correlation between PFI and dialysate IL-6 concentration was observed. Then, we examined the effects of dialysate glucose on effluent IL-6, since high concentrations of the dialysate glucose appear to be one of the causative factors of deterioration of peritoneal function. As shown in figure 2, dialysate glucose dose-dependently increased IL-6 concentration.

Although it is not known whether IL-6 is secreted by peritoneal mesothelial cells or other cell types such as fibroblasts, T cells, or endothelial cells, IL-6 could be a marker for peritoneal function and possibly histological injuries of the peritoneum. Many of the long-term CAPD patients have problems of inadequate ultrafiltration. They might drop out of the CAPD treatment or would be treated under hemodialysis until peritoneal function recovered. Therefore, measurement of effluent IL-6 might help to decide whether or not CAPD should be interrupted or discontinued. In addition, effluent IL-6 might also indicate the appropriate time to resume CAPD treatment.

Fig. 1. Correlation between IL-6 and PFI. The relationship between the PFI and dialysate IL-6 was studied in 19 patients without apparent peritoneal malfunction. The patients consisted of 11 males and 8 females, with average age of 52.4 years (38-71) and average CAPD duration

of 45.3 months (6-97). Samples for IL-6 determination were collected 6 h after liters of 2.5% glucose PD-2 was infused. IL-6 was determined by enzyme-linked immunosorbent assay. When PFI was studied, dialysate glucose concentration was 2.5% (396 mosm), infused volume of dialysate, 2 liters and dwell time, 6 h.

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Fig. 2. Dose-dependent effect of dialysate glucose on IL-6. Dialysate IL-6 was measured in 4 patients without apparent peritoneal malfunction. Dialysate glucose concentrations were 1.5% (1.5% PD-2), 2.5% (2.5% PD-2), and 4.25% (4.25% PD-2). After 2 liters of the dialysate was infused, it was drained completely, samples were collected, and then reinfused every 60 min. The means and SD are shown.

Time (h)

High concentrations of dialysate glucose, glucose degradation products, and/or lactate are involved in the factors of the harmful peritoneal stimuli, which may cause deterioration of peritoneal function. Since dialysate glucose dose-dependently increased IL-6, dialysate IL-6 might also be a marker for peritoneal stimuli. To prevent dropouts of CAPD treatment, a number of investigators are now working on biocompatibility of the peritoneal dialysate. IL-6 could be a useful tool when seeking for more biocompatible dialysate.

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