CYTOKINES: A POSSIBLE INDICES OF PERITONEAL ADEQUANCY

Ilaria Tantillo 1,2, Sabrina Milan Manani 1,2, Grazia Maria Virzì 1,2, Alessandra Brocca 1,2, Massimo de Cal 1,2, Lorena Ferrando1,2, Carlo Crepaldi 1,2 and Claudio Ronco1,2

1Department of Nephrology, St Bortolo Hospital, Vicenza, Italy; 2International Renal Research Institute Vicenza

OBJECTIVES

The Inflammation is highly prevalent in chronic kidney disease (CKD) patients. Renal replacement therapy itself may also promotes inflammation and long-term peritoneal dialysis (PD) is related to chronic inflammatory response. Systemic and local inflammatory mediators induce histopathological alterations in the peritoneal membrane. Furthermore, the most important problem during long-term PD is the preservation of peritoneal membrane function. PD adequacy is monitored primarily by indices of small solute clearance, Kt/Vurea and creatinine clearance.

Several systemic and local inflammation-related biomarkers have been associated with membrane failure and mortality in PD patients. Inflammation often coexists with malnutrition and there is a relationship between nutritional indices, as serum Albumin (Alb), and mortality. C-Reactive Protein (CRP) is an index of inflammatory activity. IL-6 and IL-1β are proinflammatory cytokines and modulate inflammation.

METHODS

We enrolled 46 PD patients (25M/21 F, age 61.5±16.4 years) with CKD undergoing maintenance PD for a minimum of 3 months were enrolled in this study. Patients were in a stable condition and free from intercurrent illness and infection for at last 3 months. 31/46 PD patients were treated with CAPD and 15 with APD.

The average length of treatment was 21 months and the range was: minimum: 3.6 – maximum: 132.9 months. Plasma levels of Alb (g/dL), CRP (mg/dL) and cytokines (IL-6 and IL-1β, pg/mL) were measured in these patients. Quantitative determination of cytokines (IL-1β and IL-6) in plasma were performed by Human Instant ELISA kit (eBioscience, San Diego, CA, USA) according to manufacturer's instructions. Optical density was read by using a VICTORX4 Multilabel Plate Reader (PerkinElmer Life Sciences, Waltham, MA, USA) at 450 nm.

We used weekly Kt/Vurea and Creatinine Clearance (wCc) as estimates of PD adequacy.

Statistical analysis was performed by STATA Software. A $p<0.05$ was considered statistically significant.

RESULTS

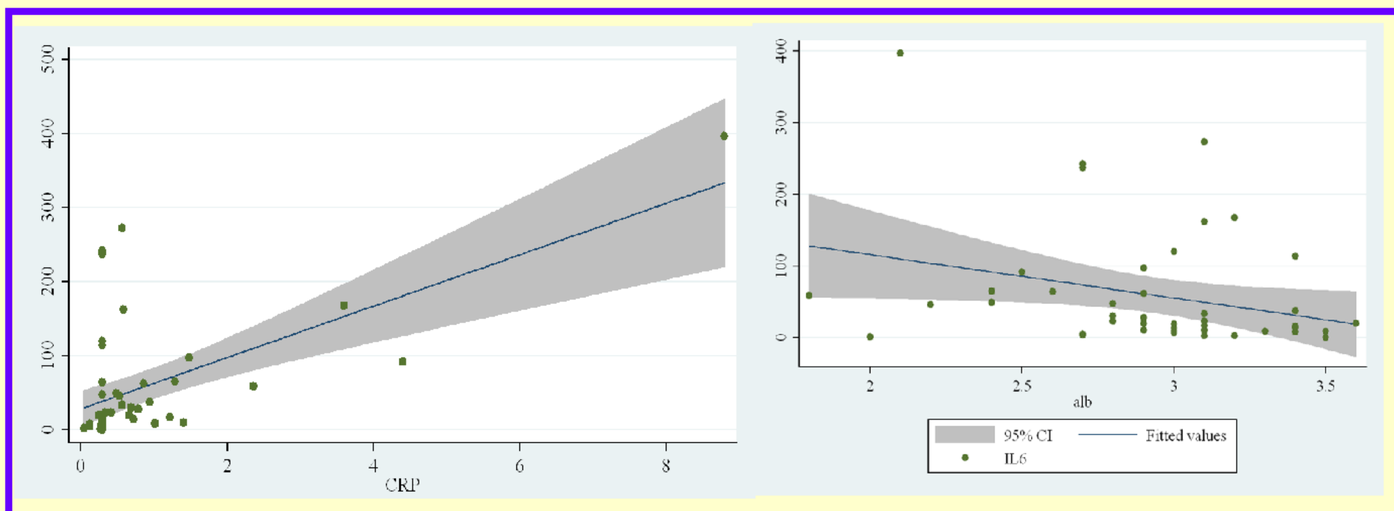

Figure 1. Correlation IL-6 and CRP and Alb

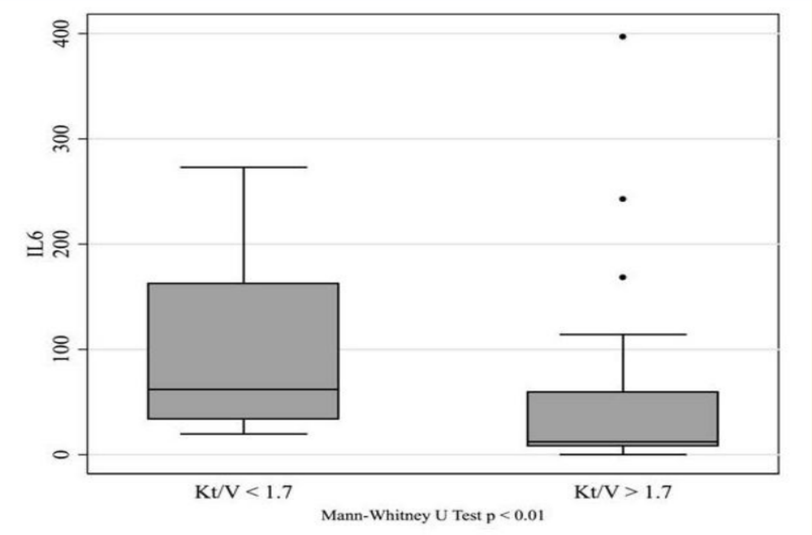

Figure 2.

The median values of Alb, CPR, IL-6 and IL-1β showed no significant differences between CAPD and APD patients. IL-6 levels showed a positive correlation with CPR ($p<0.001$) and it correlated negatively with Alb ($p=0.01$) (figure 1). There is no s statistically significant relationship between IL-1β and CRP or Alb. Subsequently, PD patients were divided into 2 groups based on Kt/Vurea value: 1.7 was the cut-off value as recommended by K/DOQI guidelines. PD patients with Kt/V <1.7 had significantly higher IL-6 compared to PD patients with Kt/V>1.7($p=0.015$) (Figure 2). The median value of IL-6 in PD patients with Kt/V<1.7 was 62 ng/ml (IQR 33-162). The median value of IL-6 in PD patients with Kt/V>1.7 was 12 ng/ml (IQR 8-59). No statistically significant relationship between IL-6 and the wCc was observed. There is no difference in IL-1β levels in PD patients with Kt/V <1.7 and with Kt/V<1.7 [.82 (0.88-5.2) *versus* 1.82 (0.95-2.7)].

CONCLUSIONS

In conclusion, we observed the correlation between IL-6 and inflammation and nutritional markers. We reported a lower levels of IL-6 in patients with better peritoneal dialysis adequacy indices, but no difference in IL-1β levels. This study suggested that, unlikely from IL-1β, IL-6, as a marker of inflammation state, may be considered a specific index of PD adequacy.

It is necessary to increase the sample size of PD subjects enrolled to validate our hypothesis.

References

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M) Dialysis. M2) Peritoneal dialysis.

sabrina milan manani

DOI: 10.3252/pso.eu.51era.2014

Poster presented at: 51 ERA-EDTA CONGRESS AMSTERDAM 2014

PosterSessionOnline.com