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Dialysis

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Survival among patients with ESRD in low versus high serum FLC levels

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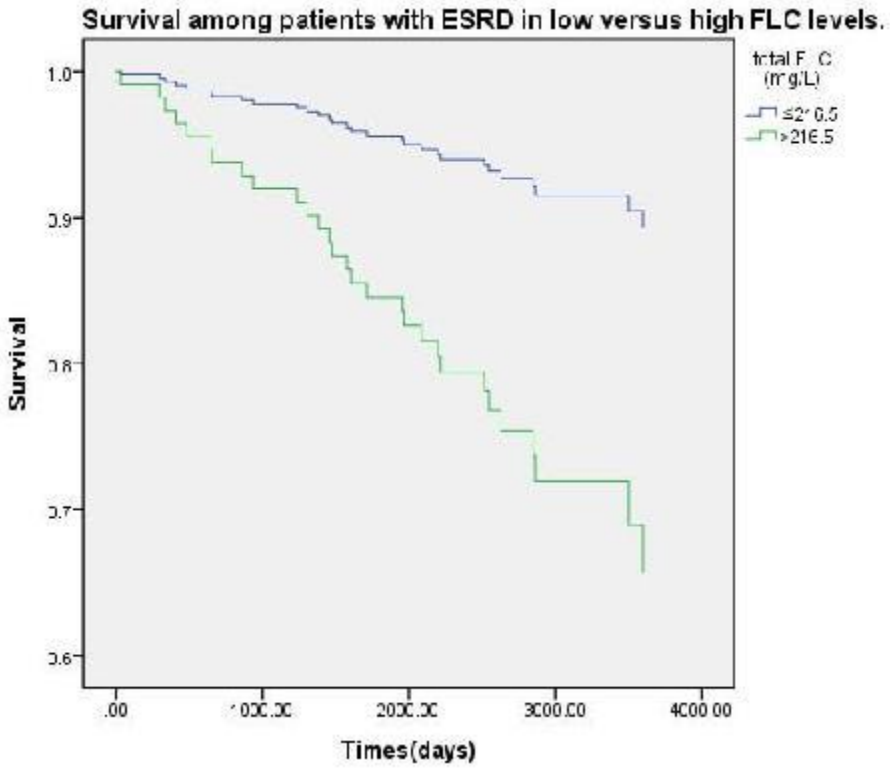
Background: Approximately 500 mg/day polyclonal free light chain (FLC) is released into the blood in chronic inflammatory disease. Serum polyclonal FLC levels may reflect the activity of the adaptive immune system. Compared to the half-life of immunoglobulin (1-2 days), the half-life of FLC is remarkably shorter (2-4 hours) as it is cleared by the kidney and reticuloendothelial system. Because the kidney plays an important role in FLC removal, FLC levels can be a marker for chronic kidney disease (CKD). The reticular system also contributes to FLC removal; therefore, polyclonal FLC levels can be used as an indicator of the activity of the reticuloendothelial system and the severity of chronic inflammatory disease. Moreover, some recent studies reported an association between polyclonal FLC level and mortality rate in CKD patients. This study was designed to determine whether polyclonal FLC level correlated with mortality rate in end-stage renal disease (ESRD) patients undergoing dialysis.

Methods: Initially, 432 ESRD patients who started hemodialysis after 2005 were enrolled. The levels of serum total FLC, FLC kappa, FLC lambda were determined at the start of dialysis. Of the 432 patients, only 300 patients whose status, whether alive or dead, was available in the data from Korean Society of Nephrology were included in this study.

Results: Of the 300 patients, 75 were dead and 225 were alive at the start of this study. Mean total FLC level was 273.5mg/L. Patient's survival status had no significant influence on the mean FLC levels. Furthermore, the levels of FLC as well as other serum parameters, including hemoglobin, phosphate, calcium, albumin, cholesterol, and PTH, showed no correlation with survival rate. Therefore, for subgroup analysis, the patients were assigned to one of two groups based on age: ≤60 years and above 60 years. In the ≤60 years group, significant difference was observed in the mean FLC levels of surviving and non-surviving patients. In cox regression analysis, elevated total FLC levels were significantly correlated with overall mortality when stratified according to the five-fold upper limit(216.5) of reference values(9.3-43.3) (P = 0.015, OR 3.7). FLC lambda showed significant positive correlation with mortality in the ≤60 years group when stratified according to the mean value, (P = 0.009, OR 2.874). FLC kappa levels showed no significant association with adjustment of compounding factors.

Conclusion: FLC levels were positively correlated with mortality in young patients (<60 years old). This finding highlights the importance of FLC level measurement for hemodialysis patients.

Figures:



Keywords: dialysis, ESRD, FLC, free light chain, kappa light chain , lambda light chain, mortality