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Fecal calprotectin correlates with serum albumin and total protein levels in patients with chronic kidney disease

Yura Chae, Jongho Son, Sungjin Chung, Eun Sil Koh
Department of Internal Medicine-Nephrology, The Catholic University of Korea, Yeouido St. Mary's Hospital, Korea, Republic of

Objectives: Persistent inflammation, a characteristic feature in chronic kidney disease, contributes to decreased serum albumin levels and plays a central role in the Malnutrition, Inflammation and Atherosclerosis (MIA) syndrome, which is associated with poor clinical outcomes. Altered bowel habit is also a highly frequent status among patients with chronic kidney disease potentially due to their low fiber and fluid intake, medications, multiple comorbidities and dysbiosis of the gut microbiota. In this study, we have explored whether measurement of fecal calprotectin, a commonly used marker for increased neutrophil migration and local inflammation in gastrointestinal diseases, could reflect a state of low serum albumin in patients with chronic kidney disease.

Methods: Clinical and biochemical data including stool samples for calprotectin were collected from 129 chronic kidney disease patients with no history of inflammatory bowel disease.

Results: Fecal calprotectin was not different according to estimated glomerular filtration rate, degree of proteinuria and medication of polystyrene sulfonate and ferrous sulfate. However, it was significantly and negatively correlated with serum albumin and total protein concentrations in patients with chronic kidney disease (r=-0.260, p=0.003 and r=-0.250, p=0.004, respectively). Patients with higher tertile of fecal calprotectin were older and likely to have lower hematocrit and serum total protein levels. Multivariable linear regression analysis showed that fecal calprotectin was significantly correlated with serum albumin (β=-0.268, P=0.012). In adjusted multivariable linear regression, serum albumin and total protein levels were independently correlated with fecal calprotectin (β=-0.229, P=0.012 and β=-0.227, P=0.025, respectively).

Conclusions: These observations that serum albumin and total protein were significantly correlated with fecal calprotectin in patients with chronic kidney disease, suggest that the bowel inflammatory response may be another contributing factor.