ZONULIN, INFLAMMATION AND IRON STATUS IN PATIENTS WITH EARLY STAGES OF CHRONIC KIDNEY DISEASE

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BACKGROUND

Chronic kidney disease (CKD) is commonly accompanied by inflammation, which contributes to iron homeostasis and is responsible for impaired iron distribution despite adequate iron stores in the body. Iron absorption takes place in small intestines, where the only known modulator of intracellular tight junction is zonulin that is also considered as a potential inflammatory marker.

The aim of the study was to investigate zonulin levels in patients with early stages of CKD and its relations with inflammation, anemia and iron status.

METHODS

88 patients with CKD were enrolled in the study and divided into two groups – with and without subclinical inflammation according to hsCRP measurements. Serum hemoglobin, creatinine, iron, TIBC and ferritin levels were obtained using standard laboratory methods in certified local central laboratory. Commercially available kits were used to measure zonulin, hsCRP, hepcidin-25, Il-6, soluble transferrin receptor (sTfR). Analyses of the correlation of each parameter were performed using Pearson or Spearman correlation coefficients.

RESULTS

There were no statistically significant differences in zonulin concentration between patients with and without inflammation as well as anemic and non-anemic patients with CKD. However, zonulin was significantly correlated with hepcidin (r= - 0,37, p<0.05) only in patients with inflammation defined as elevated hsCRP > 10 mg/dl. Hepcidin was correlated with TSAT (r= 0,49, p<0.05), ferritin (r = 0.73, p<0.05) and sTfR (r = -0.41, p <0.05) in both groups as well as in independent analysis.

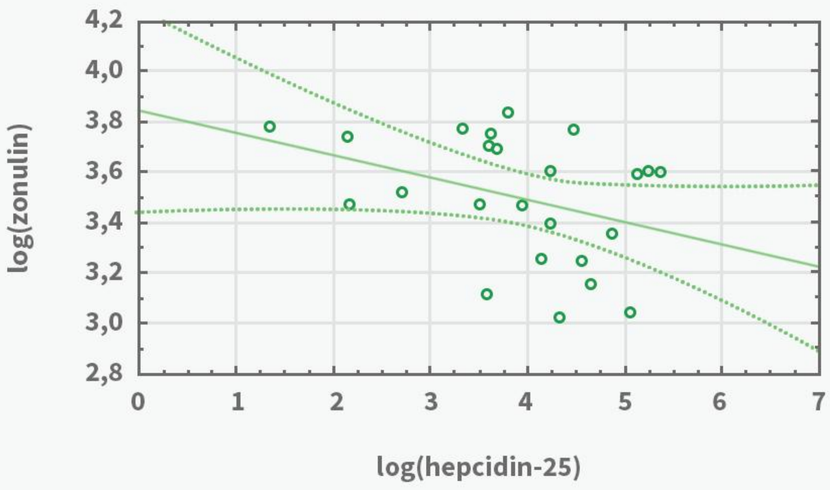

Fig. 1 Correlation between zonuluin and hepcidin in patients with inflammation, r=-0.37

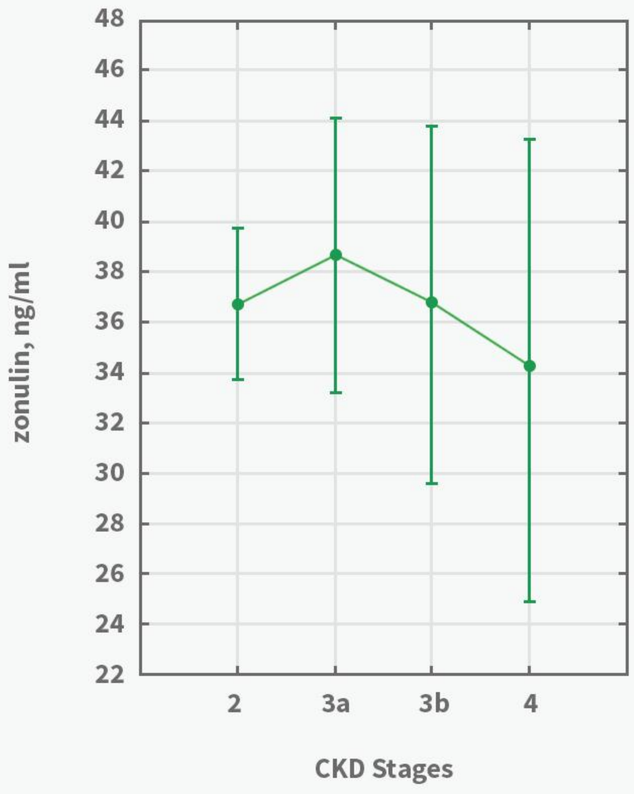

Fig. 2 One-way ANOVA, F(3, 84)=0.62 p=0.85

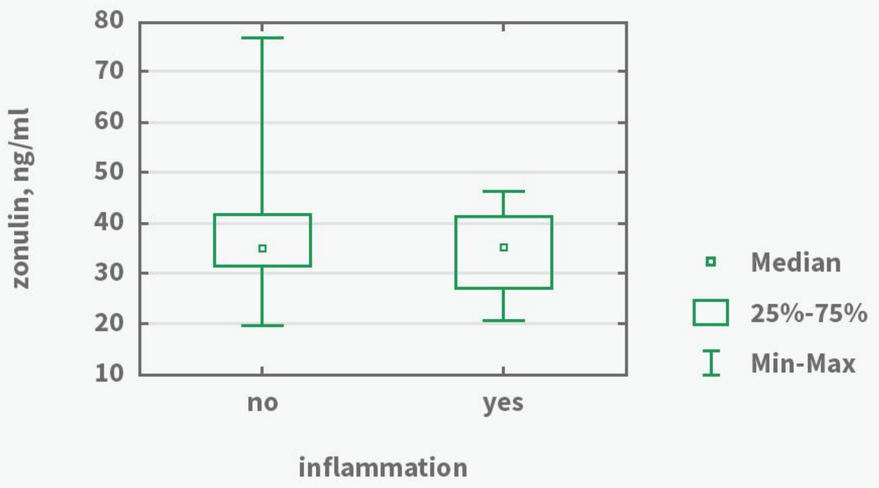

Fig. 3 Zonulin concentration in CKD with and without inflammation

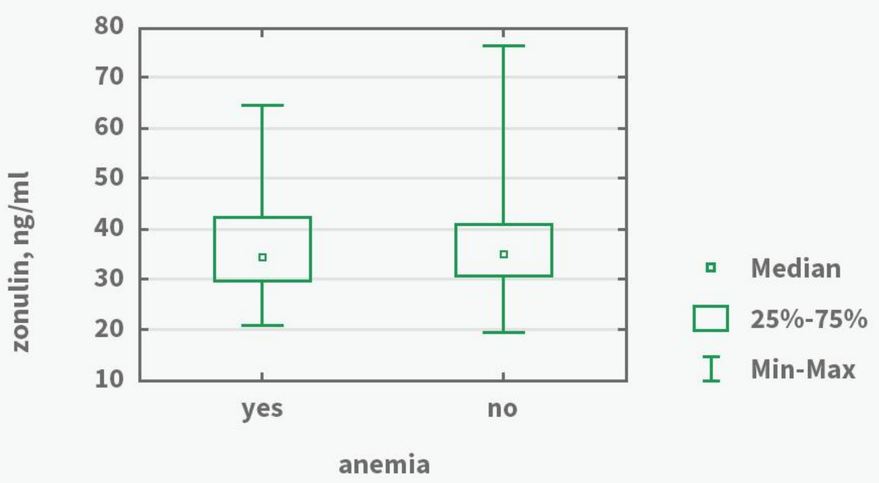

Fig. 4 Zonulin concentration in CKD with and without anemia

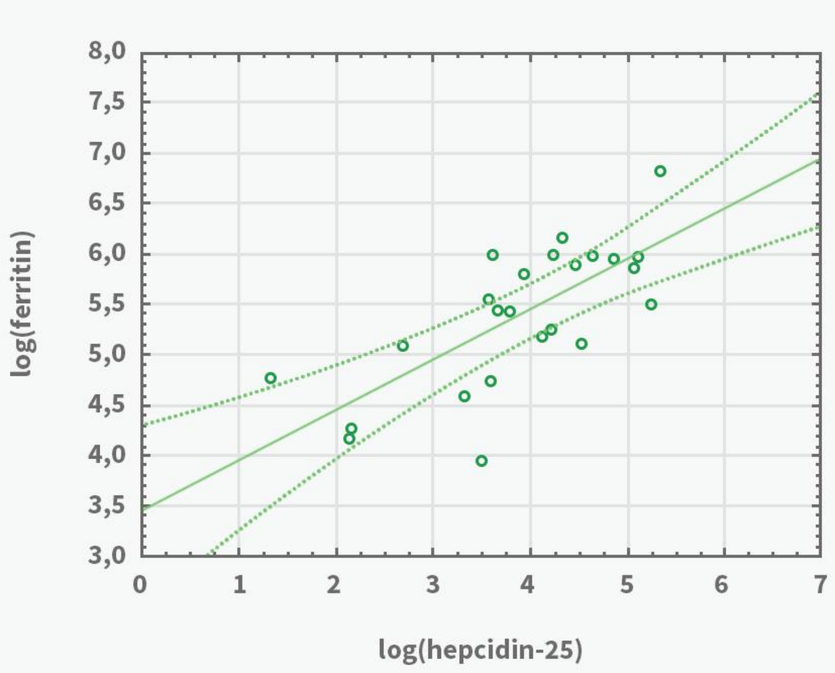

Fig. 5 Correlation between ferritin and hepcidin-25 in patients with inflammation, r=0.71

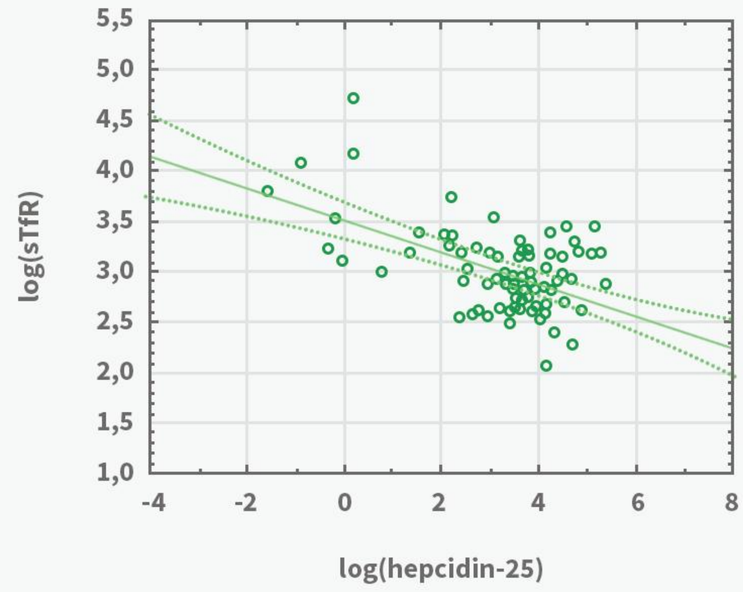

Fig. 6 Correlation between hepcidin-25 and sTfR in all patients, r=-0.41

CONCLUSIONS

Patients with CKD and inflammation have significanly impaired iron status. The important role is played by hepcidin, however, zonulin might be considered as a new marker of subclinical inflammation and thereby contribute to iron homeostasis in chronic diseases.

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