YKL-40: a new uraemic toxin?

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INTRODUCTION AND AIM

In the last few years there has been a growing number of publications concerning YKL-40, a 40 Kd glycoprotein mainly produced by inflammatory and cancer cells. YKL-40 regulates vascular endothelial growth factor and has a role in inflammation, angiogenesis, cell proliferation and differentiation. Recently has been established that serum YKL-40 has a prognostic impact on all-cause mortality in patients with hearth failure and has been introduced as a marker of inflammation in different clinical situations, also in chronic kidney disease.

The aim of this study was to investigate serum YKL-40 concentrations in chronic renal failure patients (CKD5) in conservative therapy and in dialysis therapy compared to healthy subjects and to explore its relationships with interleukin-6 (IL-6), C-reactive protein (CRP), and Hepcidin (HEP). Furthermore we investigated if YKL-40 serum levels are influenced by different dialysis techniques.

METHODS

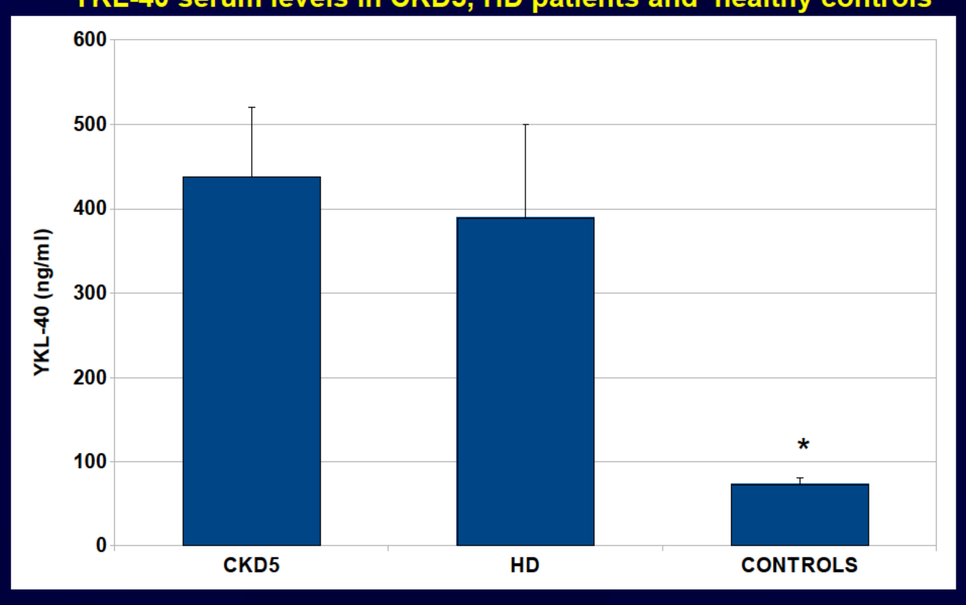
The study population included low inflamed hemodialytic patients (N =13), CKD5 patients not receiving dialysis (N=6) and healthy subjects (N = 6).

HD patients were treated in bicarbonate hemodialysis (BHD) with low flux polysulphone (PS) membrane group for six months. At the end they were shifted in On-line hemodiafiltration (OL-HDF) group with high flux PS membranes and exchange volume > 20 litres.

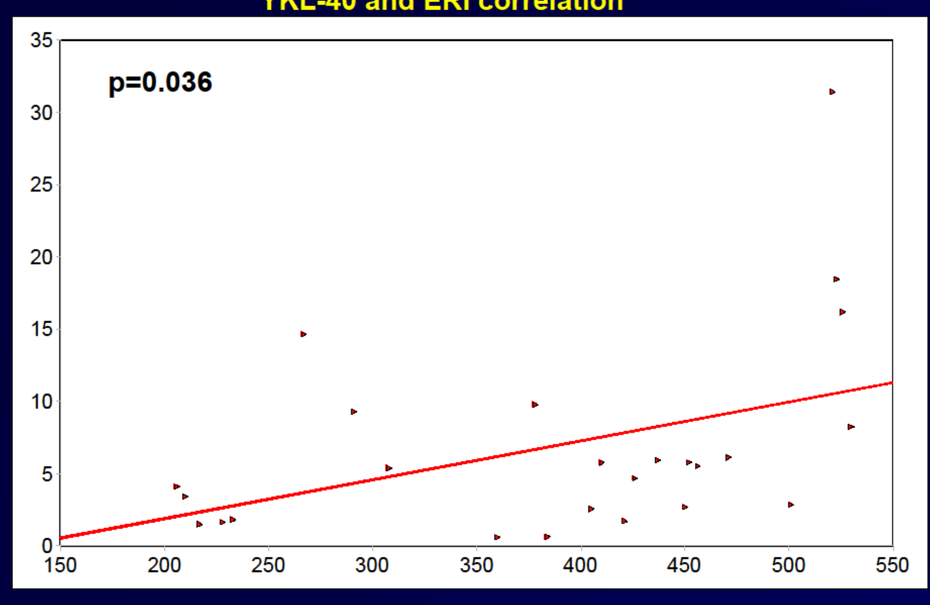
Serum was collected at the end of each treatment period. Routine laboratory analysis, IL-6 and CRP levels were determined by local laboratory, instead hepcidin (HEP) and YKL-40 serum concentration was centrally determined by ELISA kit (DRG Instruments GmbH, Germany and Quidel Corporation San Diego, USA, respectively). Resistance to EPO was determined as ERI (weekly ESA dose/Kg/Hemoglobin). Data were analyzed using X^2 Test e Mann-Whitney test and Spearman's correlation coefficient. The null-hypothesis was rejected when $p<0.05$

RESULTS

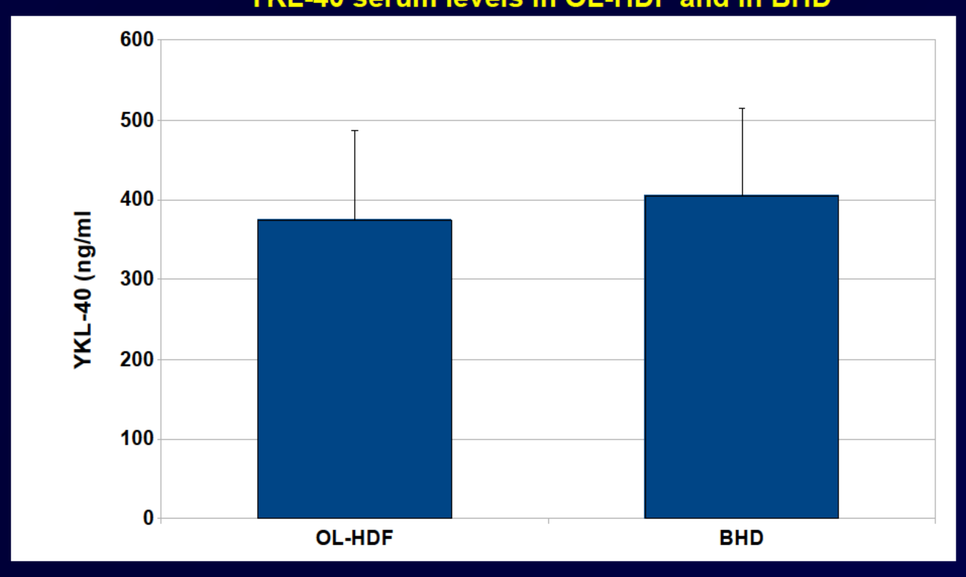
YKL-40 serum levels in CKD5, HD patients and healthy controls



YKL-40 and ERI correlation



YKL-40 serum levels in OL-HDF and in BHD



YKL-40 serum levels were significantly higher in CKD5 and HD patients respect to healthy controls ($p<0.01$). Difference between CKD5 and HD was not statistically significant. Moreover, YKL-40 levels were lower in OL-HDF (374.25±112.6 ng/ml) than in BHD (404.7±110.23 ng/ml) but the difference was not statistically significant ($p=0.20$). In HD patients YKL-40 was significantly related ($p=0.036$) with ERI but not with CRP, IL-6, and Hepcidin.

CONCLUSIONS

YKL-40 serum levels were increased in patients affected by chronic renal failure. In low inflamed HD patients YKL-40 was not related to CRP and IL-6, but demonstrated a positive relation with ERI. This data suggest that YKL-40 in HD was enhanced also by a mechanism independent by inflammation and may act as an uremic toxin

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M) Dialysis. M9) Protein-energy wasting, inflammation and oxidative stress in CKD 5D.

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