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## INTRODUCTION AND AIMS

Chronic kidney disease-mineral bone disorder (CKD-MBD) is one of the most frequent complications of end-stage renal disease (ESRD). Abnormal bone metabolism leads to osteoporosis with a reduction of bone mineral density (BMD) and associated with bone fractures, increase of morbidity and mortality. The CKD-MBD could be associated with chronic subclinical inflammation which is frequently observed in hemodialysis (HD) patients. The aim of this study was to evaluate the relationship between bone mineral density reduction and chronic subclinical inflammation in HD patients.

## METHODS

18 adult HD patients (mean age 58.8±12.27 years, 47% male, mean HD vintage 64.8±55.3 months) have been included in the observational study. During the 12 months, biochemical markers of mineral and bone metabolism, such as Ca, P, alkaline phosphatase, parathyroid hormone were examined monthly. Also every two months level of c-reactive protein (CRP) was measured, and once in the end of study indicators of the immune status such as IL-2, IL-4, IL-6, IL-10, TNF-alpha was examined. At the end of the study period x-ray densitometry of femur bone was performed, Total BMD (g/cm<sup>2</sup>), Wards BMD (g/cm<sup>2</sup>), Total T-score, Wards Z-score and Wards T-score were evaluated.

## RESULTS

In assessing the relationship of the inflammation indicators and immune status with changes in the bone mineral density we have found inverse correlation between the serum CRP levels and Wards Z-score ( $r=-0.68$ ,  $p<0.05$ , Fig. 1) and Wards BMD ( $r=-0.61$ ,  $p<0.05$ , Fig. 2). Also we revealed an inverse correlation between the serum IL-10 levels and Wards Z-score ( $r=-0.67$ ,  $p<0.05$ , Fig. 3) and Wards BMD ( $r=-0.71$ ,  $p<0.05$ , Fig. 4). By separating the patients into two groups on the basis of the severity of bone deficiency (Group 1 - normal bone mass, or osteopenia initial, Group 2 - osteopenia or osteoporosis) significantly higher levels of CRP in patients with osteoporosis was revealed (Group 1 CRP=9.2±3.5 g/l, Group 2 CRP=18±5.1 g/l;  $p<0.001$ , Fig.5)

Fig. 1. Correlation between serum CRP levels and Wards Z-score

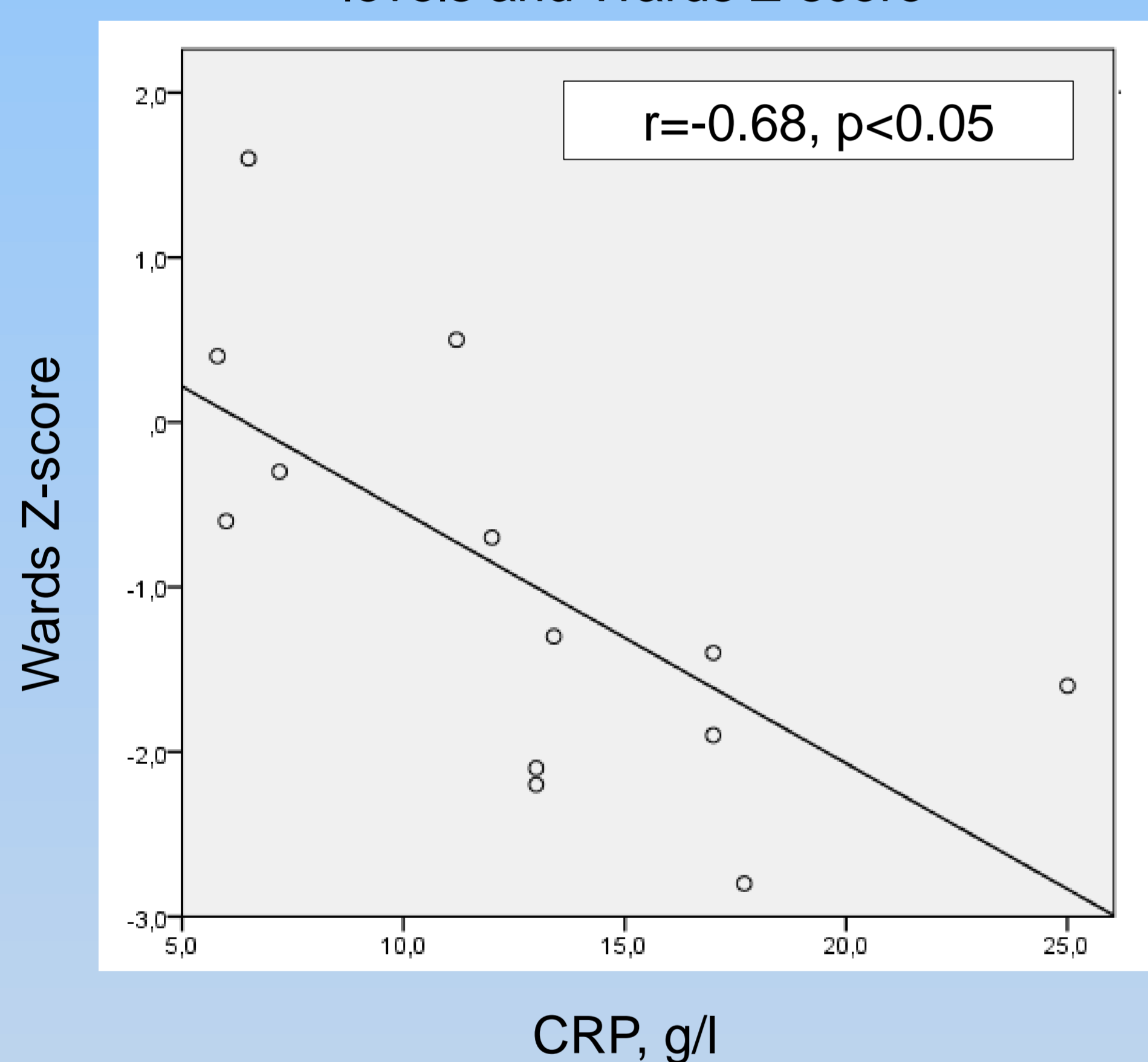


Fig. 2. Correlation between serum CRP levels and Wards BMD

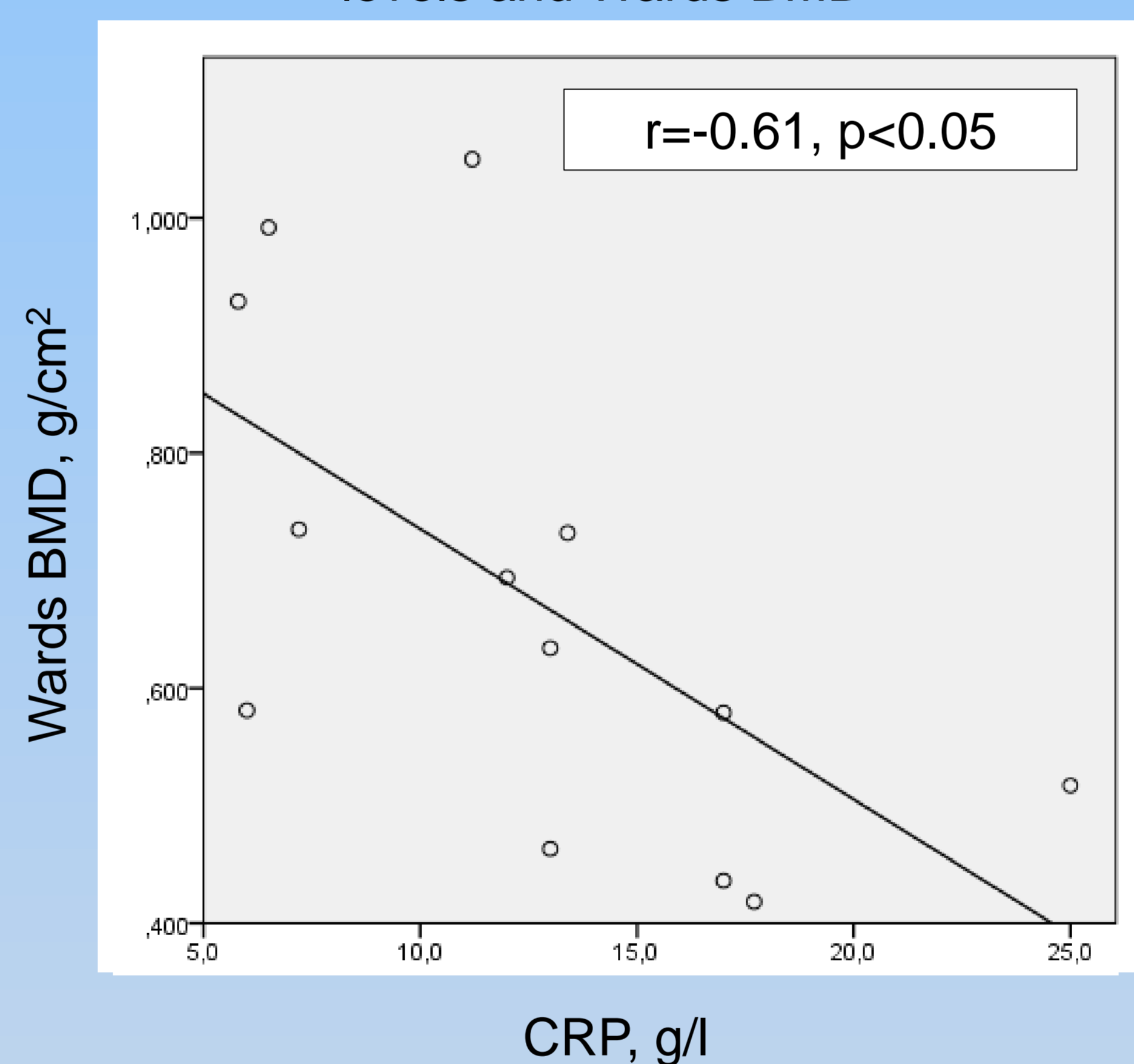


Fig. 3. Correlation between serum IL-10 levels and Wards Z-score

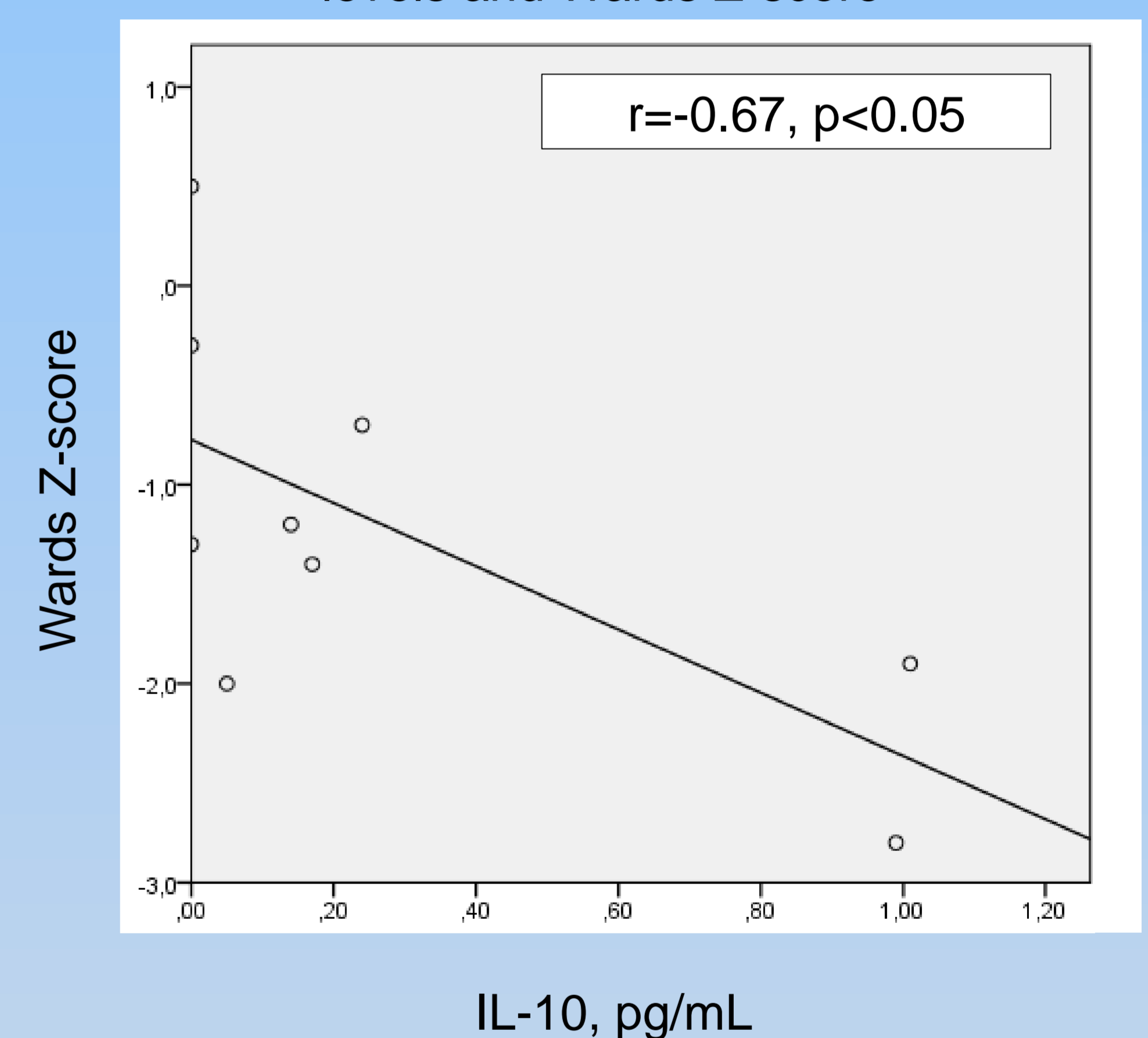


Fig. 4. Correlation between serum IL-10 levels and Wards BMD

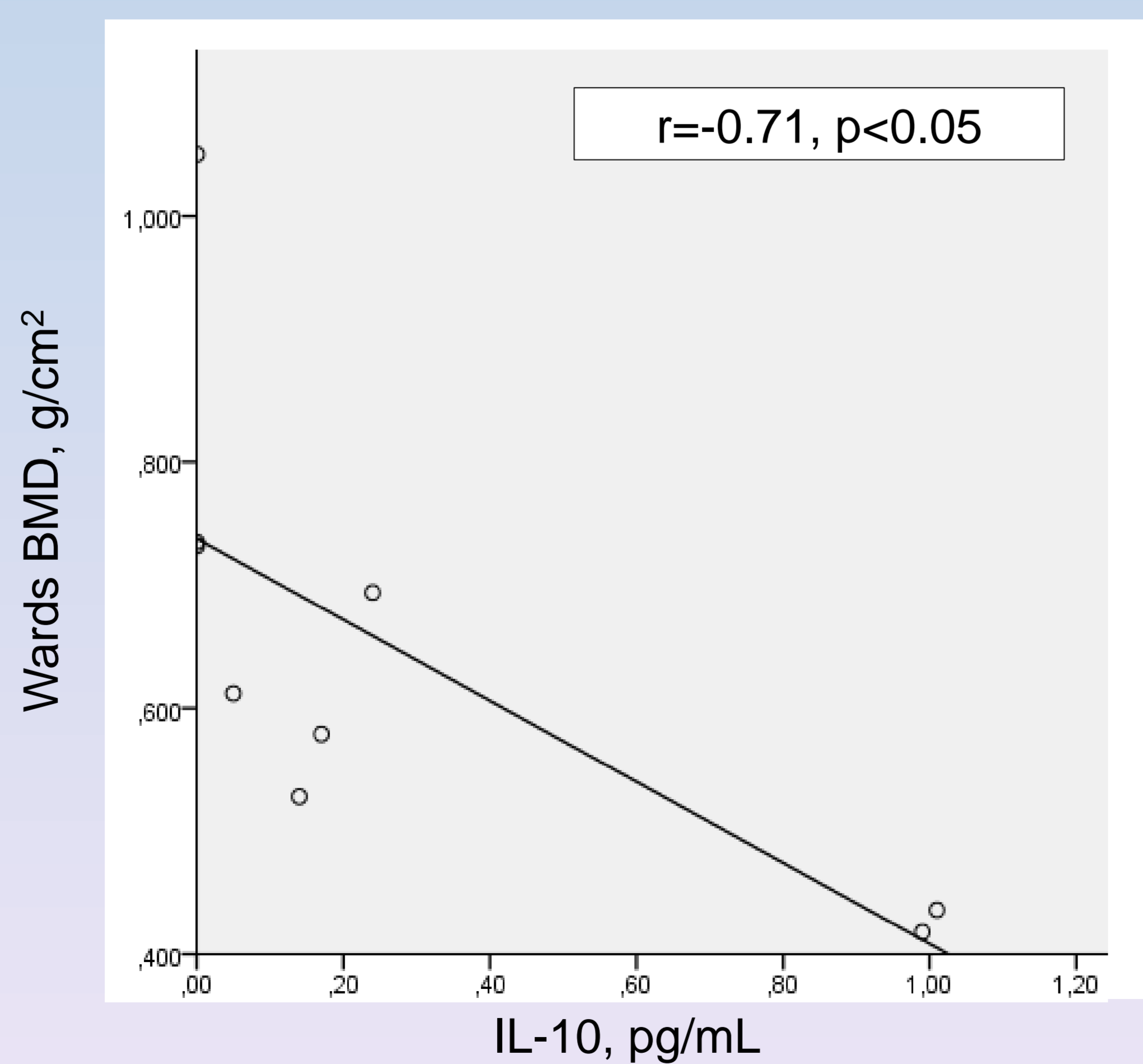
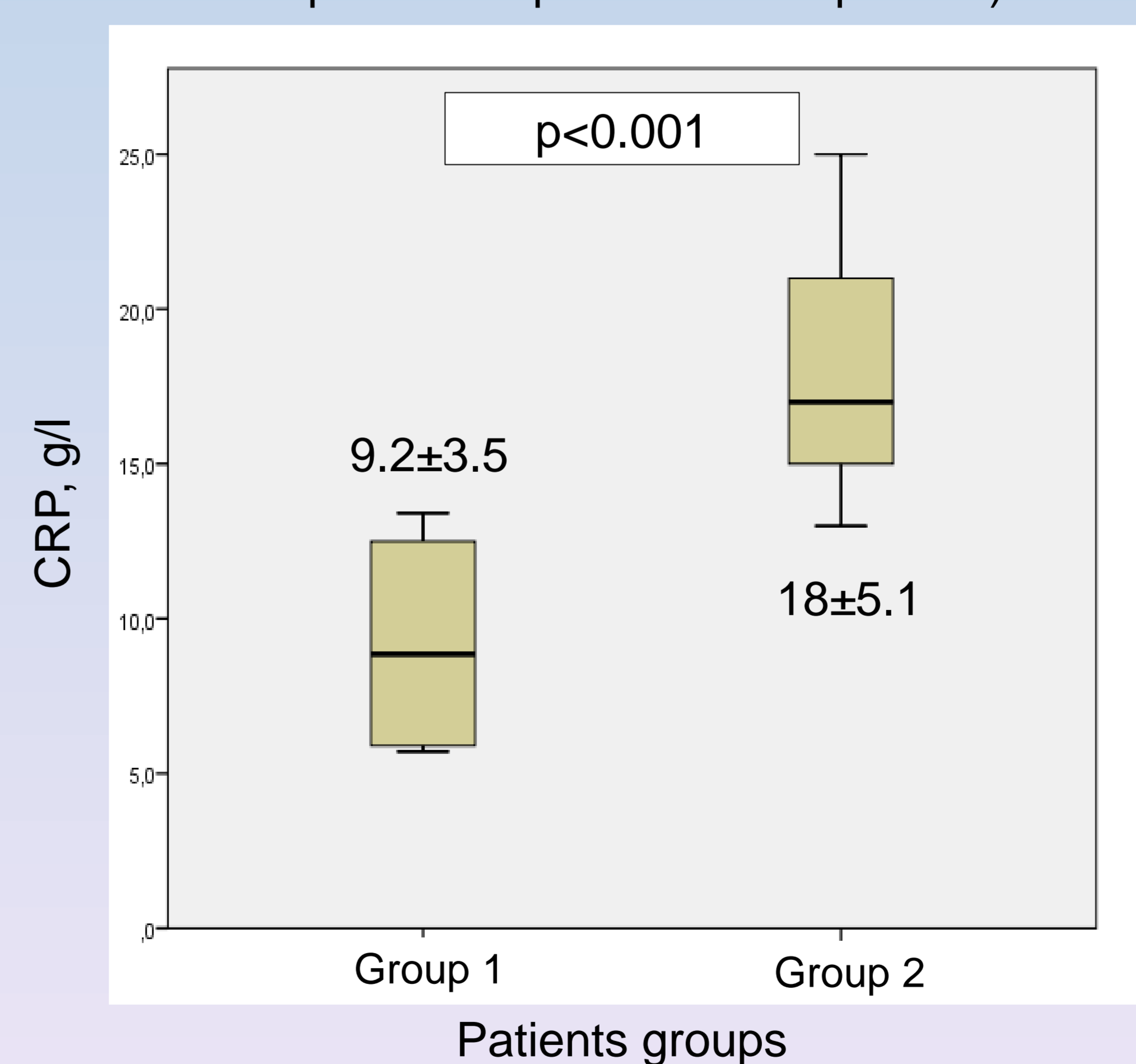


Fig. 5. Patients groups by severity of bone deficiency (Group 1 - normal bone mass, or osteopenia initial, Group 2 - osteopenia or osteoporosis)



## CONCLUSIONS

The study demonstrated relationship between chronic inflammation and loss of bone density in HD patients. The data are requiring further study for identification of the cause-and-effect relationship between chronic inflammation and impaired bone mineral density in HD patients.