

# Vitamin D levels in autoimmune thyroiditis and a control group among the Polish population.

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## Background

Vitamin D, primarily known for its role in calcium-phosphorus homeostasis, is also a significant immunomodulatory factor. Vitamin D deficiency has been reported in some autoimmune disorders. Recently, vitamin D level in autoimmune thyroiditis (Hashimoto's thyroiditis – HT) has become the subject of interest, considered as one of the potential environmental risk factors.

## Objective

This study aims to assess vitamin 25-OH-D3 level in HT patients in comparison to a control group in the Polish population. This would be the first attempt conducted in this poor sunlight exposure region.

## Patients

The group consisted of 62 subjects diagnosed with HT (mean age  $49.15 \pm 15.51$ , female to male ratio 56/6) and 32 healthy controls matched with age and sex (mean age  $46.09 \pm 14.32$ , female to male ratio 28/4). All the patients studied have an atrophic form of autoimmune thyroiditis and were euthyroid (the majority due to levothyroxine substitution), with a mean of TSH 1.2 mIU/L. In both the HT group and control group, subjects with autoimmune disorders other than HT, any neoplasms, metabolic bone disorders (osteopenia, osteoporosis), renal or liver dysfunctions or with recent vitamin D supplementation were excluded.

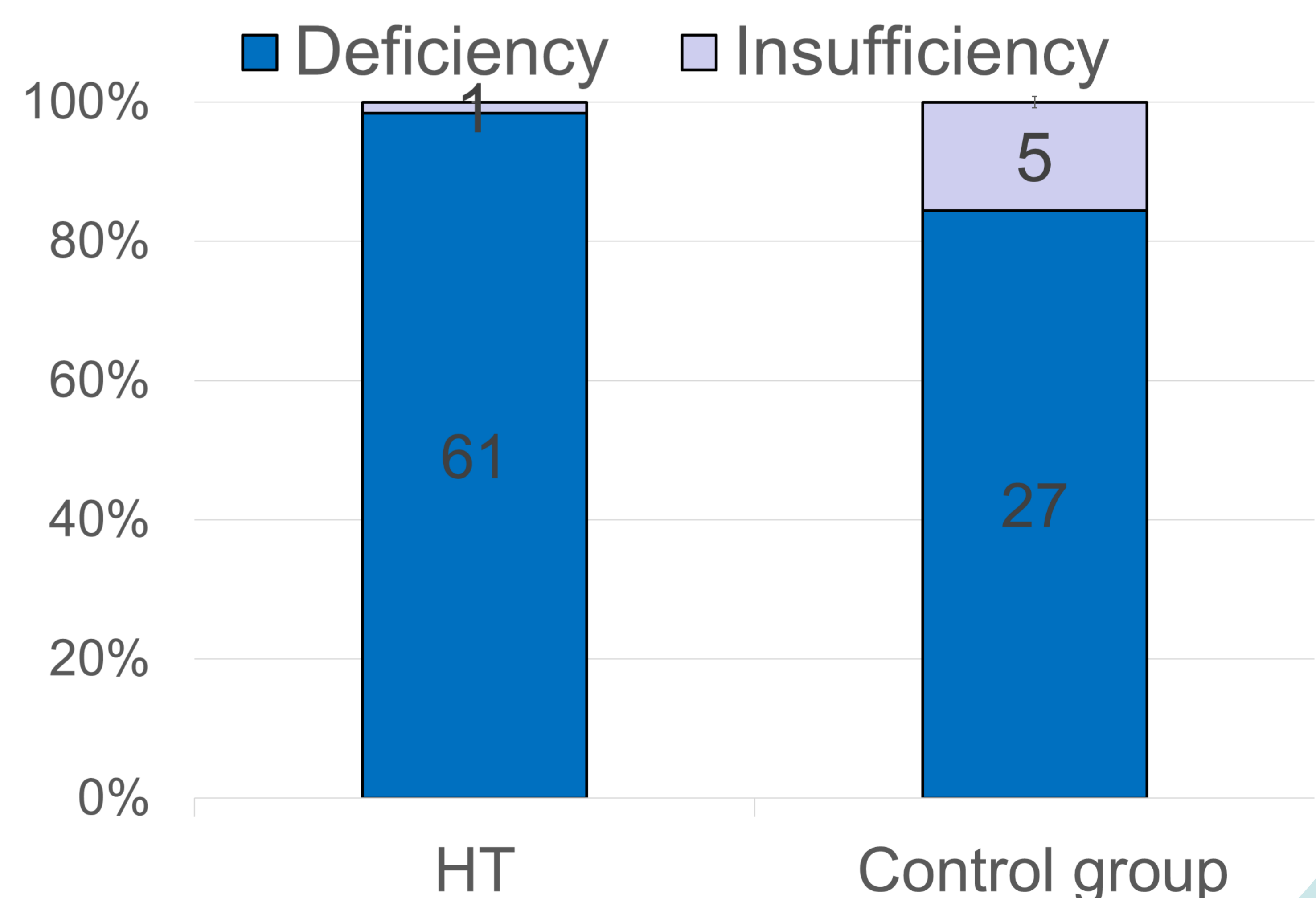
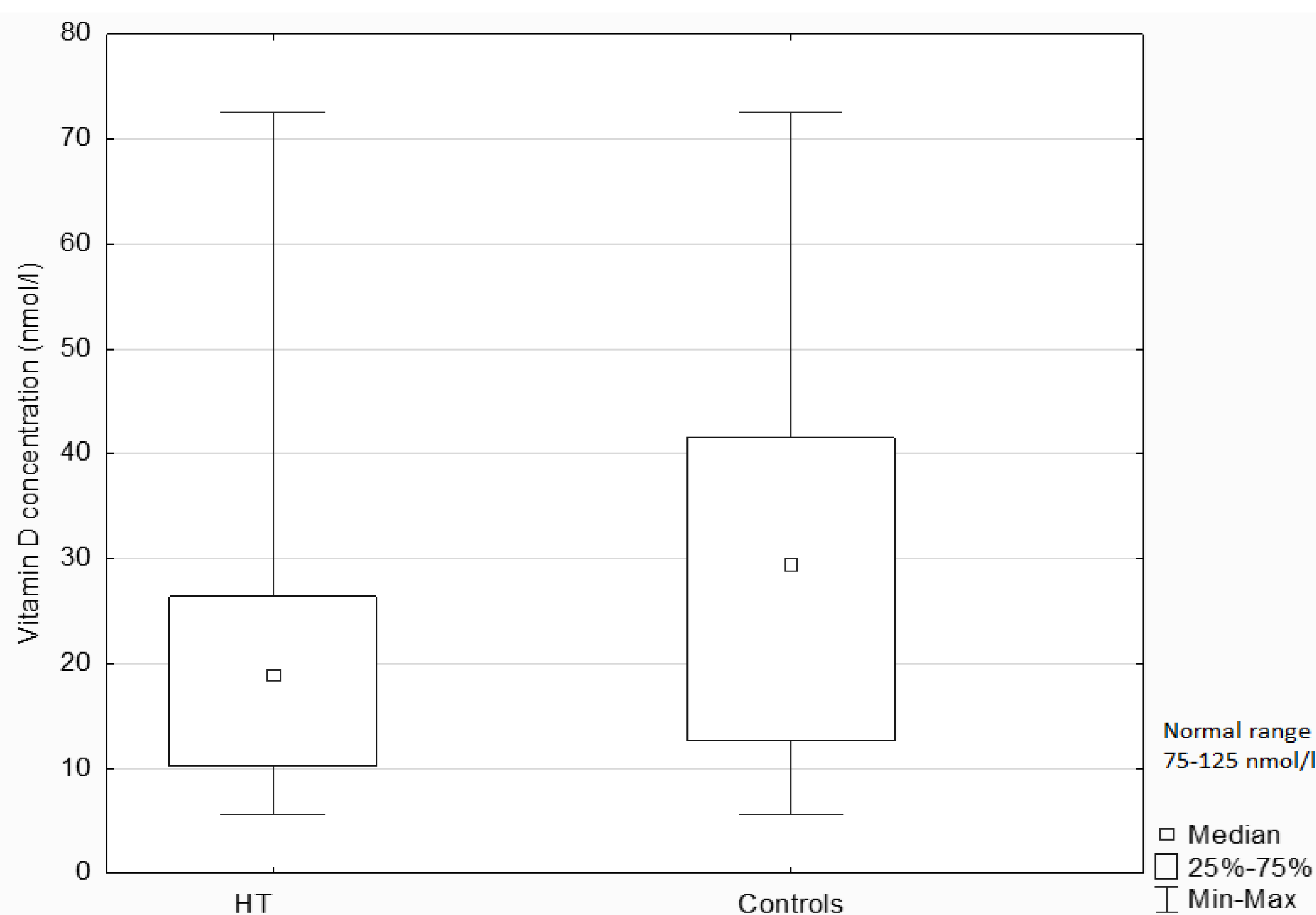
## Methods

Venous blood samples were collected and 25-OH-D3 serum concentrations were measured using a 25-OH Vitamin D EIA Kit (Immundiagnostik AG, Germany). All samples were taken in the first quarter of the year to minimize the impact of seasonal fluctuations in vitamin concentration.

The normality of distribution was evaluated by the Shapiro-Wilk test. The Mann-Whitney U test and the chi-square ( $\chi^2$ ) test with Yates' correction were used to assess the significance of differences in vitamin D concentration and in the frequency of vitamin deficiency, respectively. A p-value below 0.05 was considered statistically significant.

## Results

In the HT group the mean vitamin D level was **20.09 (SD  $\pm 12.66$ ) nmol/l**, compared to **30.31 (SD  $\pm 19.49$ ) nmol/l** in the controls,  $p=0.014$ . None of the patients and controls was vitamin D sufficient (according to the normal level - a serum concentration between 75 and 125 nmol/l). The deficiency (vitamin D < 50 nmol/l) was significantly more common among HT patients compared to the controls (61 - 98.4% vs. 27 - 84.4%),  $p=0.029$ .



## Conclusions

- Mean vitamin D serum concentration is significantly lower in HT patients compared to the control group in our study. This may suggest vitamin D deficiency as one of the causative factors for HT development, although it cannot be ruled out that changes in vitamin D levels occur rather as a consequence of the disease and further studies are needed to confirm its etiopathogenetic role.
- Vitamin D deficiency is frequent not only in the HT group but also in the controls, which seems disturbing in the light of reports of its pleiotropic role, the need of wider supplementation in our latitude should be emphasized.