



# Relationship Between Vitamin D Level and Graves' Disease

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## Introduction and Aim

It is suggested that vitamin D deficiency is an effective factor in the pathogenesis of many autoimmune diseases. There are only a few studies investigating relationship between vitamin D deficiency and Graves' disease (GD) which is an autoimmune thyroid disease. Therefore, in this study we compared the vitamin D levels in patients with GD and healthy controls and examined whether there were correlations between vitamin D levels and laboratory and clinical parameters in GD.

## Materials and Methods

The medical records of 92 patients with GD aged between 18-75 and 223 healthy controls matched according to age and gender from Cerrahpaa Adult Endocrinology Clinic were examined retrospectively and the laboratory and clinical data for the study were obtained. Diagnosis of Graves' disease is made by the presence of clinical findings of hyperthyroidism, diffuse goiter, increased free triiodothyronine (FT3), free thyroxine (FT4), thyrotropin receptor antibodies (TRab), Anti-TPO, anti-Tg levels in the blood and suppressed serum TSH (<0.1  $\mu$ IU/mL) level and diffusely increased uptake in thyroid scintigraphy.

## Results

Patients with GD had significantly lower vitamin D levels compared to controls (19.08  $\pm$  7.53 vs. 21.98  $\pm$  10.02 ng/mL,  $p=0.02$ ). The prevalence of vitamin D deficiency (<20 ng/mL) and insufficiency (20-30 ng/mL) was higher in GD (57.6% vs 48.4%,  $p<0.001$ , and 38% vs 30.5%,  $p<0.001$ , respectively) compared to controls. In patients with GD, there were no correlations between the levels of vitamin D and TRab, FT3 and FT4. There was no difference in the vitamin D levels between Graves ophthalmopathy positive and negative patient groups (18.39  $\pm$  6.8 vs. 18.58  $\pm$  6.8 ng/mL,  $p = 0.79$ ).

Table 1. Vitamin D levels in controls and patients with Graves disease (GD)

	Controls (n=223)	GD (n=92)	p values
Vitamin D (ng/ml)	21,98 $\pm$ 10,02	19,08 $\pm$ 7,53	0,02
According to different vitamin D levels:			
D vit. deficiency <20 ng/ml (n, %)	108 (%48,4)	53 (%57,6)	<0,001
D vit. insufficiency 20-30 ng/ml (n, %)	68 (%30,5)	35 (%38)	<0,001
D vit. sufficiency >30 ng/ml (n, %)	47 (%21,1)	4 (%4,3)	<0,001

Table 2. Correlation of Vitamin D Levels with Laboratory Parameters in GD Patients

	TRab	Anti-TPO	Anti-Tg	FT3	FT4
Vitamin D (ng/ml)	r = -0,007 p = 0,945	r = -0,001 p = 0,995	r = -0,007 p = 0,945	r = -0,169 p = 0,107	r = -0,203 p = 0,053

Table 3. Vitamin D levels in ophthalmopathy positive and negative patient groups

Ophthalmopathy	Positive (n=12)	Negative (n=80)	
Vitamin D (ng/ml)	18,39 $\pm$ 6,8	18,58 $\pm$ 6,8	p = 0,79

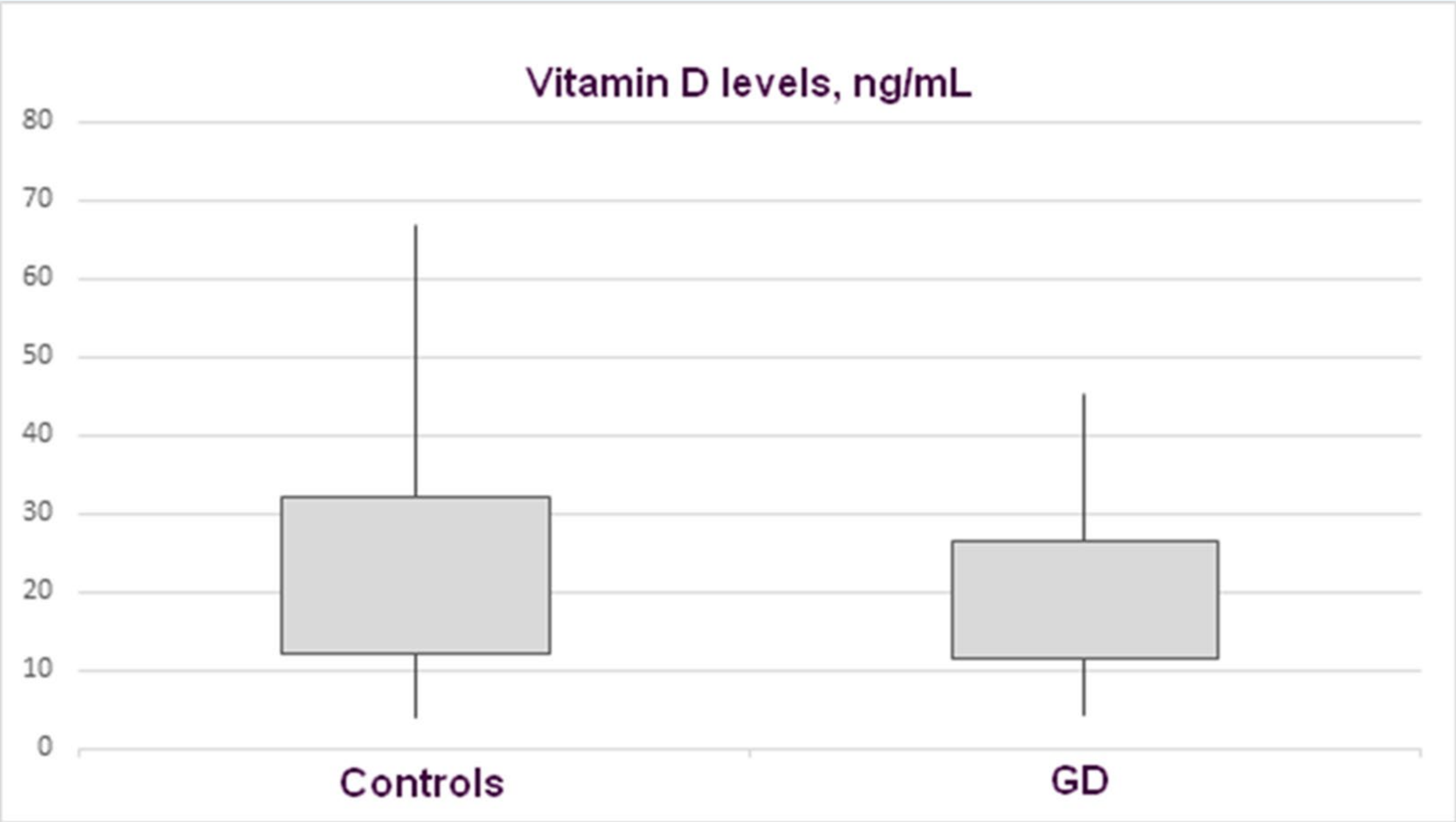


Fig. 1. Vitamin D levels in controls (n = 223, 21.98  $\pm$  10.02 ng/mL) and patients with Graves disease (GD) (n = 92, 19.08  $\pm$  7.53 ng/mL,  $p=0.02$ )

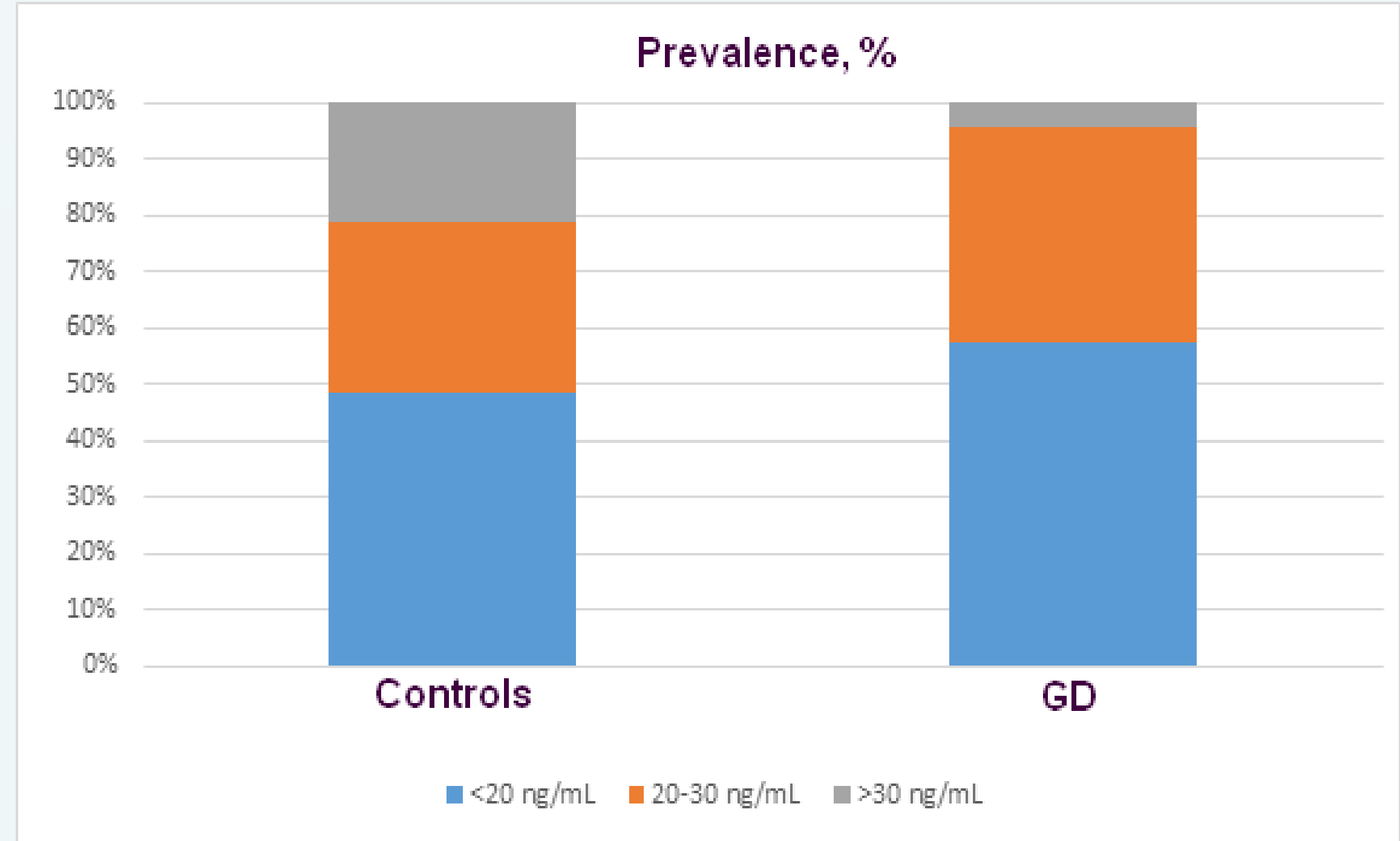


Fig. 2. Prevalence of different vitamin D levels in controls and patients with Graves disease (GD) (<20 ng/mL: 48.4 vs. 57.6%, 20-30 ng/mL: 30.5 vs. 38%, >30 ng/mL: 21.1 vs. 4.3%,  $p<0.001$ )

## Conclusion

In this study, we demonstrated that patients with GD had lower vitamin D levels compared to healthy controls; but, there was not any effect of the vitamin D levels on the laboratory or clinical parameters of GD.

## References

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