

# Prevalence of vitamin D deficiency in Slovak women with polycystic ovary syndrome and its relation to metabolic and reproductive abnormalities

Figurová J.<sup>1</sup>, Petříková J.<sup>1</sup>, Dravecká I.<sup>1</sup>, Javorský M.<sup>2</sup>, Lazúrová I.<sup>1</sup>

<sup>1</sup> 11<sup>st</sup> Department of Internal medicine, L. Pasteur University Hospital and Medical faculty of P.J. Šafárik University, Košice

<sup>2</sup> 24<sup>th</sup> Department of Internal medicine, L. Pasteur University Hospital and Medical faculty of P.J. Šafárik University, Košice

## OBJECTIVES

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder characterised by menstrual dysfunction, infertility, presence of polycystic ovaries and biochemical and clinical hyperandrogenism affecting up to 4 – 18 % women of reproductive age [1]. There is an evidence that PCOS women suffer from various metabolic disturbances such as visceral obesity, insulin resistance, impaired glucose tolerance, dyslipidemia, type 2 diabetes mellitus and metabolic syndrome [2]. Vitamin D is thought to influence the development of PCOS through gene transcription and hormonal modulation of insulin metabolism and fertility regulation [3].

## METHODS

- Study sample:
  - 99 women with PCOS according to Rotterdam criteria
  - 66 regularly menstruating controls
- Methods:
  - 25(OH)D, anthropometric, endocrine and metabolic parameters were evaluated
  - vitamin D deficiency: serum level of 25(OH)D <30 ng/ml
  - insulin resistance: HOMA-IR > 2,5
  - metabolic syndrome according to NCEAP ATPIII

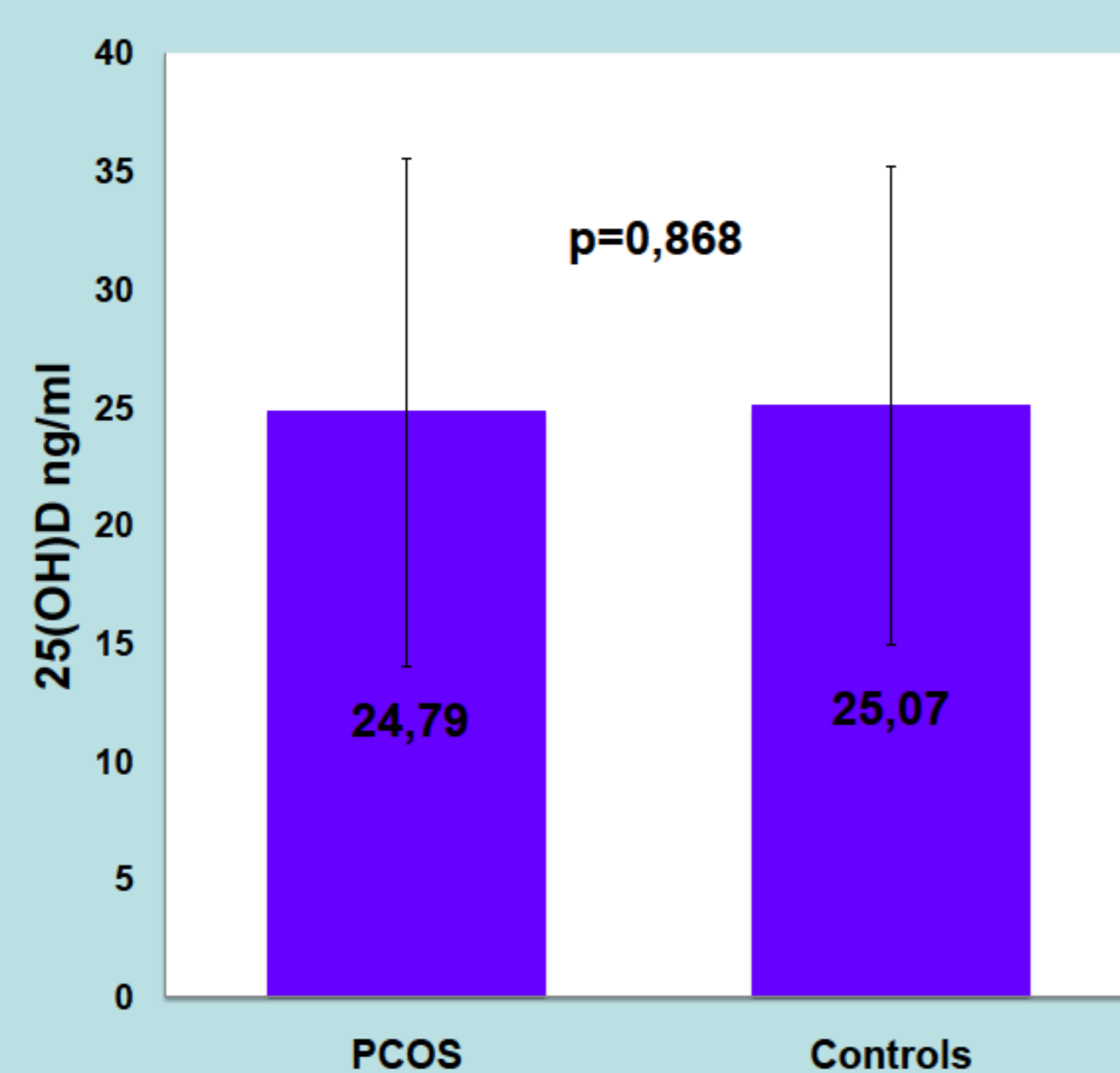


Figure 1. Serum levels of 25(OH)D in PCOS group and controls.

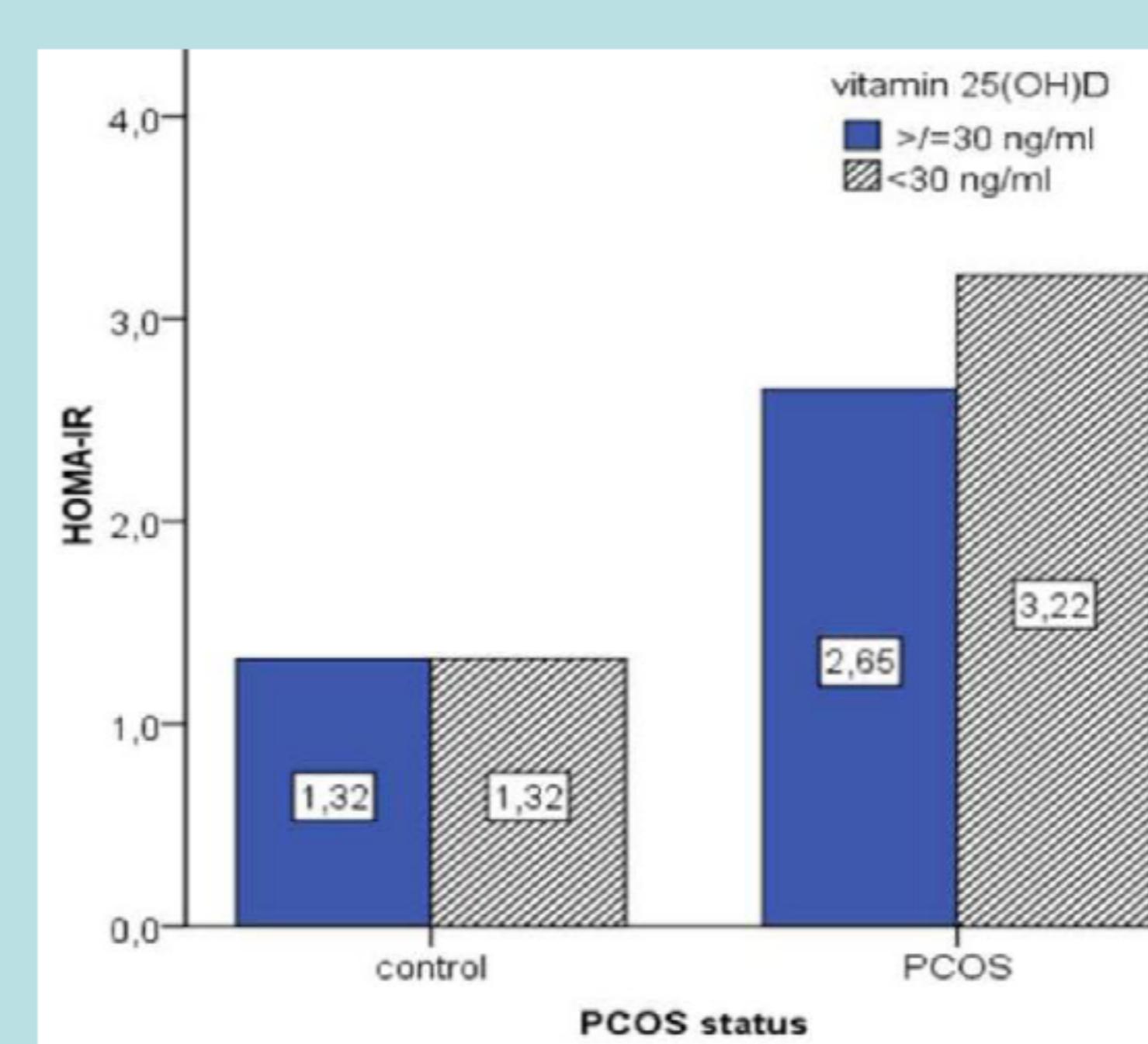


Figure 2. Comparison of HOMA-IR index between PCOS and control group in subgroup of vitamin D deficient subjects ( $p < 0.001$ ; adjusted for age, BMI:  $p_{\text{adj}} = 0.036$ ) and vitamin D non deficient subjects ( $p = 0.015$ ;  $p_{\text{adj}} = 0.748$ ).

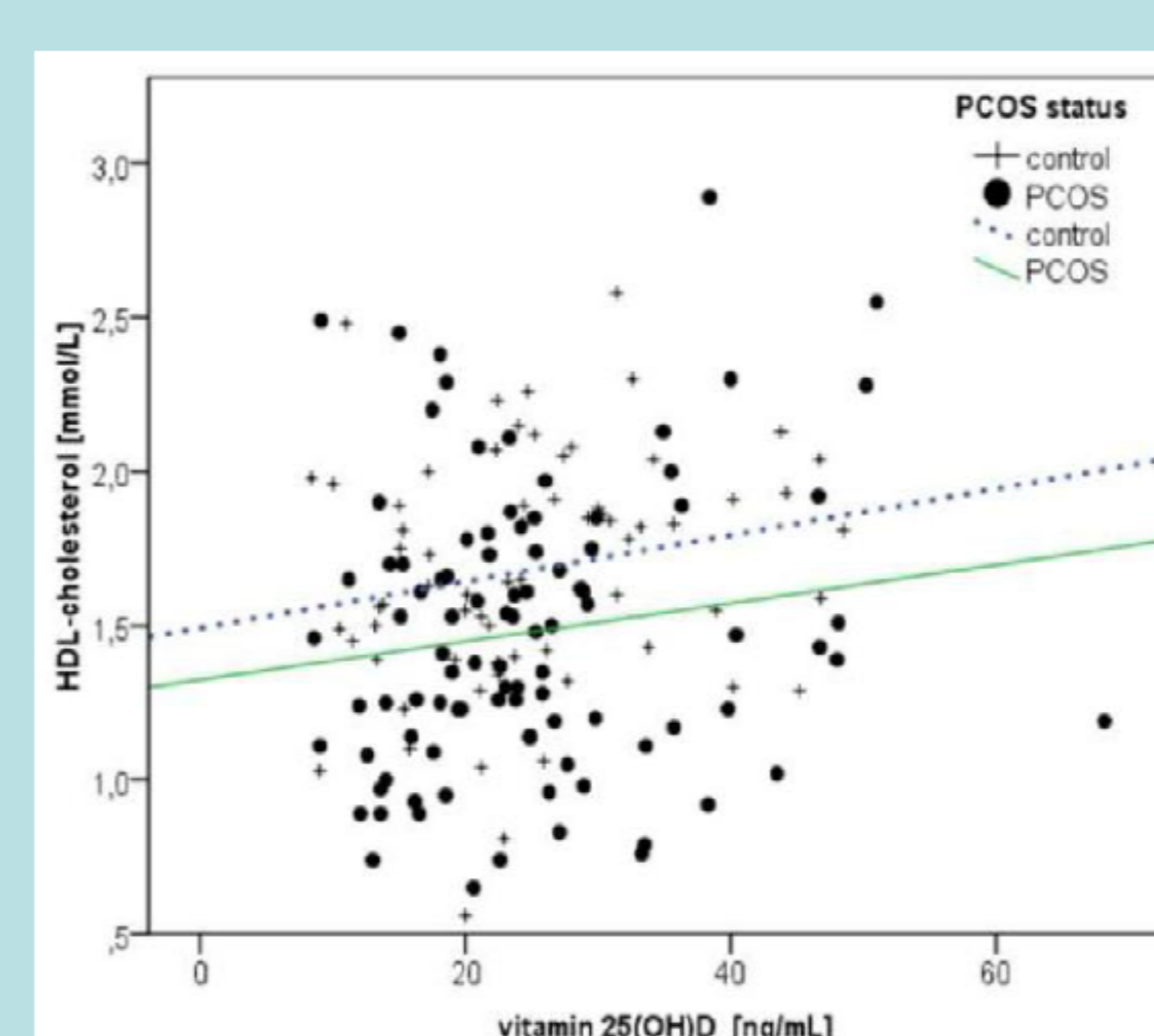
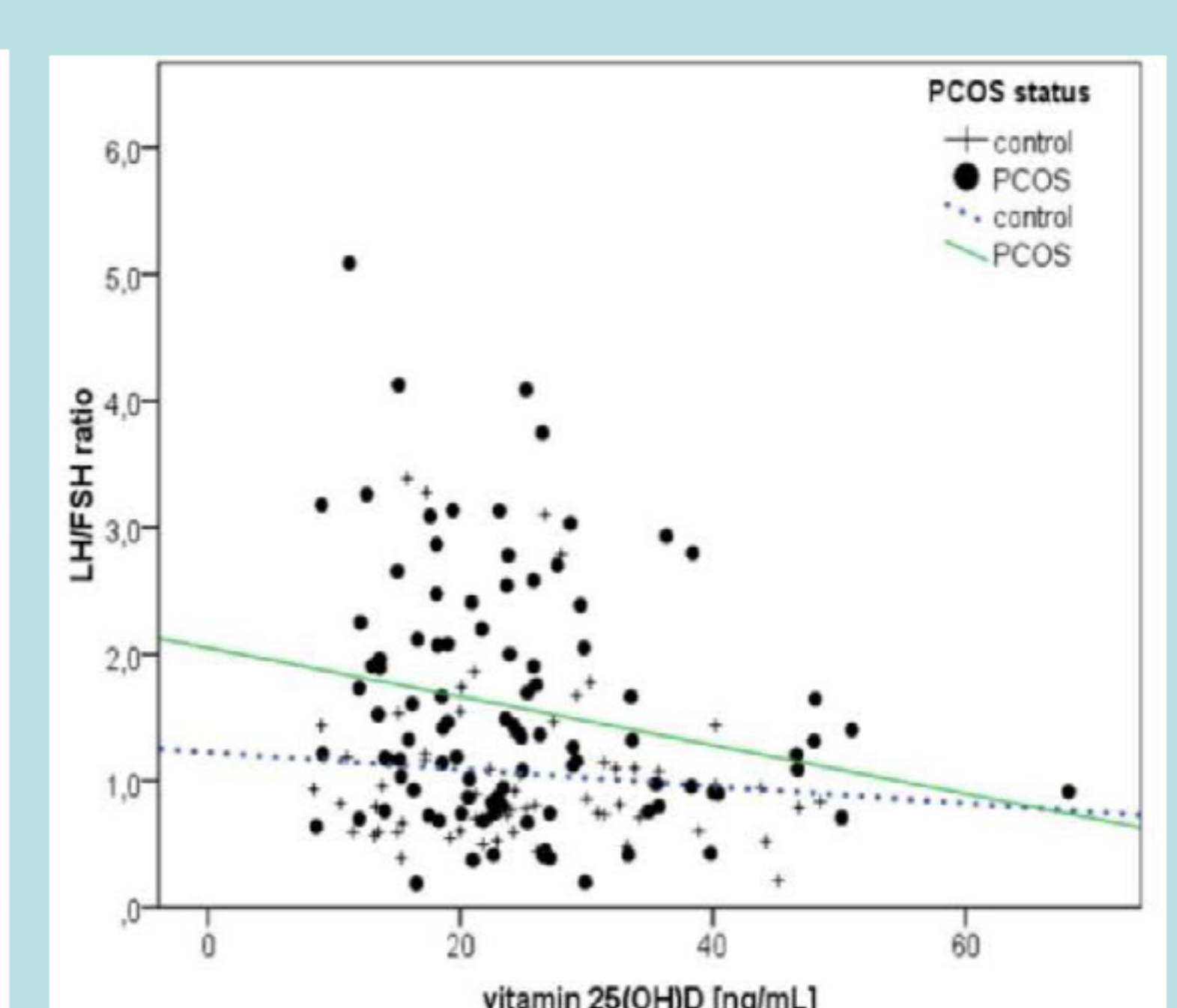


Figure 3. a) Positive correlation between 25(OH)D levels and serum HDL-cholesterol in all subjects ( $r = 0.159$ ,  $p = 0.043$ ). b) Negative correlation between 25(OH)D levels and LH/FSH ratio in PCOS ( $r = -0.211$ ,  $p = 0.037$ ).



## RESULTS

There was no significant difference in 25(OH)D levels between PCOS women and controls ( $24.79 \pm 10.77$  vs  $25.07 \pm 10.14$  ng/ml,  $p = 0.868$ ) and also in the prevalence of 25(OH)D deficiency in both groups (80 vs 70%;  $p = 0.138$ ). PCOS women with metabolic syndrome (MS) had lower serum 25(OH)D compared to those without MS ( $20.6 \pm 8.3$  vs  $25.9 \pm 11.3$  ng/ml,  $p = 0.049$ ). PCOS women with vitamin D deficiency had borderline higher serum triglycerides ( $1.44 \pm 0.93$  vs  $1.03 \pm 0.46$ ,  $p = 0.051$ ) and tended to have higher HOMA-IR (median [quartiles]:  $2.24$  [ $1.38$ -  $3.51$ ] vs  $1.85$  [ $1.04$ - $3.68$ ],  $p = 0.467$ ) compared to PCOS with sufficient vitamin D levels. 25(OH)D correlated positively with HDL-cholesterol in all subjects ( $r = 0.159$ ,  $p = 0.043$ ;  $p$  adjusted for age, BMI,  $p_{\text{adj}} = 0.03$ ) and negatively with LH/FSH ratio ( $r = -0.211$ ,  $p = 0.037$ ) in PCOS.

## CONCLUSIONS

We demonstrate high prevalence of vitamin D deficiency in the population of young women in reproductive age with no difference in serum vitamin D concentration between PCOS patients and control group subjects. Low vitamin D status was associated with presence of the metabolic syndrome in PCOS women. Insulin resistance and other metabolic and reproductive abnormalities in PCOS women seem to be related to PCOS rather than to vitamin D deficiency. It was already described that both vitamin D deficiency and PCOS are associated with features of metabolic syndrome, but it is still unclear whether vitamin D deficiency may contribute to the metabolic disturbances commonly found in PCOS women.

## REFERENCES

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