

# Mineral balance, parathormone and vitamin D in patients with polycystic ovary syndrome.

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## Introduction

Recent data showed that polycystic ovary syndrome (PCOS) is related to abnormal calcium and phosphate metabolism. The patients are characterized by elevated levels of phosphorus and parathyroid hormone (PTH) and decreased levels of vitamin D. Abnormalities in mineral homeostasis are related to insulin resistance.

In this study we assessed a complex of calcium and phosphate metabolism indices in patients diagnosed with PCOS.

## Materials

**PCOS** 52 women, aged 26±6 years diagnosed with PCOS according to Rotterdam criteria were  
**Controls** 24 healthy women aged 27±5 years

## Methods

**Calcium & phosphorus** concentrations were measured in:

- serum
- 24 hours urine collection
- fractional urine excretion was assessed.

We also measured the **25OH-vitamin D3, PTH, gonadotropins, estradiol, testosterone, and lipid fraction** concentrations.

Serum **insulin** and **glucose** concentrations were used to calculate the **HOMA** index.

## Results

PCOS patients presented typical hormonal disturbances for PCOS with higher LH and testosterone serum levels and lower estradiol serum concentrations in comparison to controls.

**Total serum calcium levels were higher in PCOS patients** ( $2.38 \pm 0.07$  vs  $2.31 \pm 0.09$  mmol/L,  $p=0.007$ ) but were within normal range.

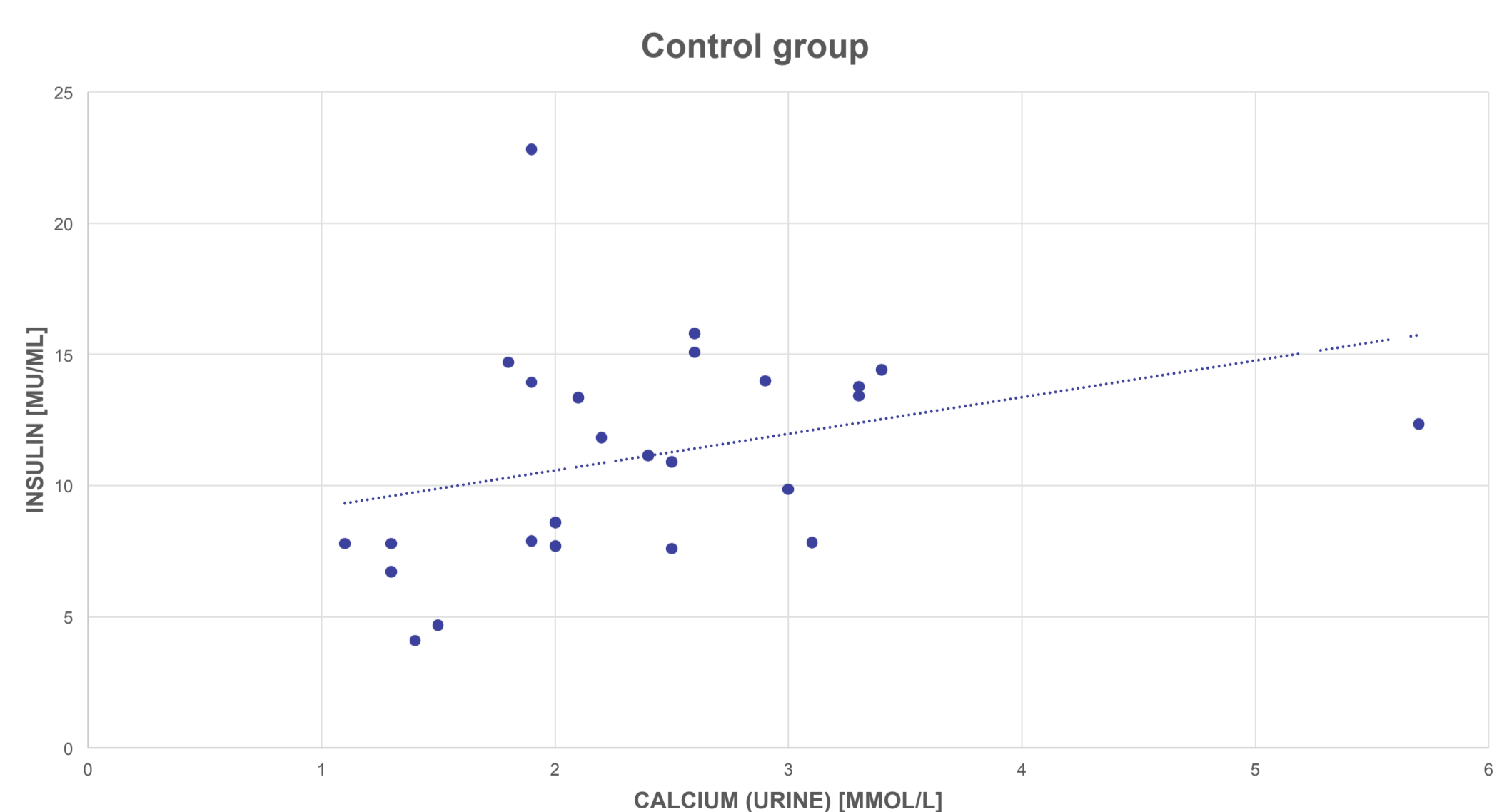
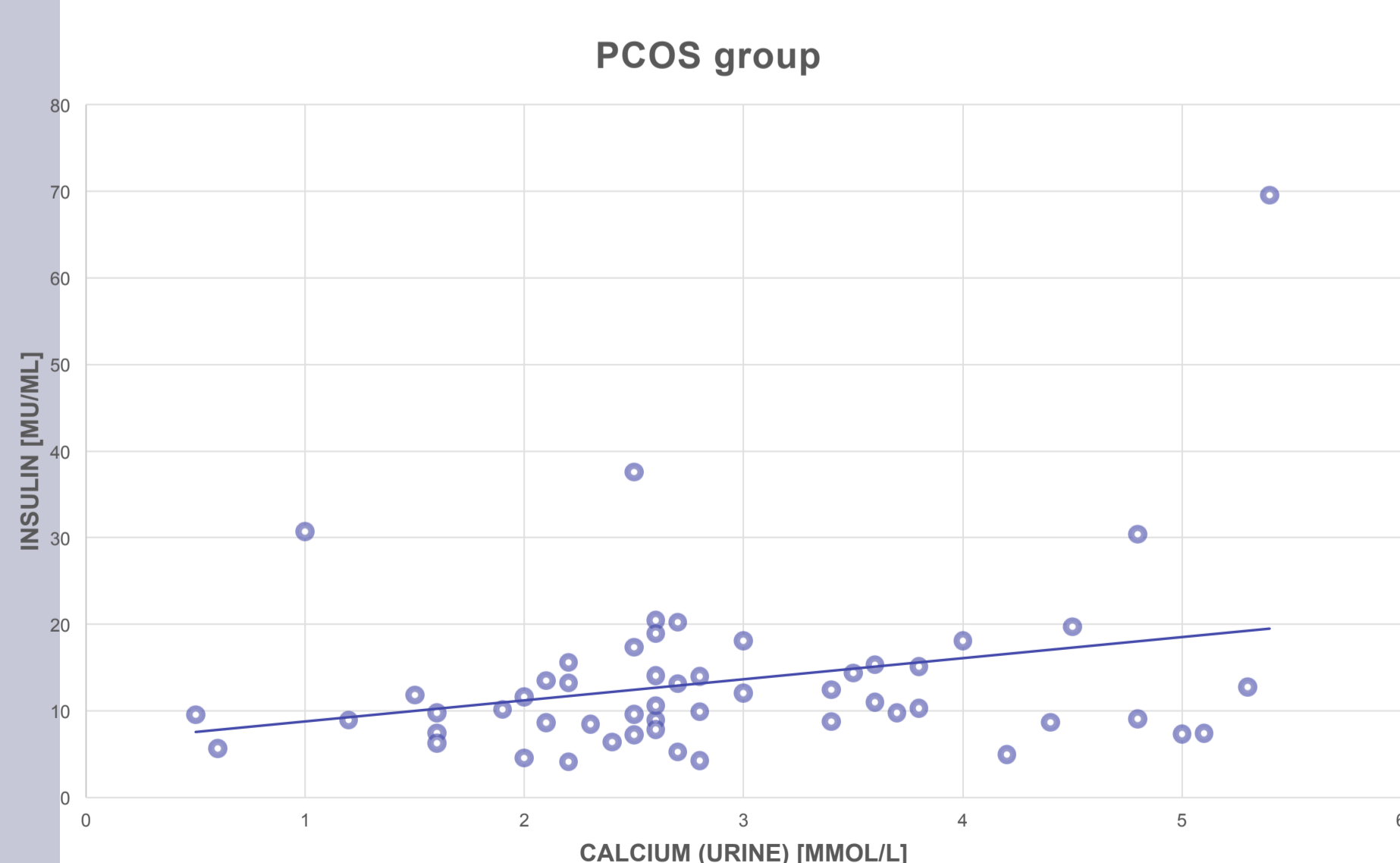
**Urine calcium and phosphorus concentrations were higher in PCOS group:**

- Calcium:  $2.87 \pm 1.19$  in PCOS vs  $2.42 \pm 0.96$  mmol/L in controls,  $p=0.050$ ,
- Phosphorus:  $47.20 \pm 23.05$  in PCOS vs  $37.11 \pm 12.65$  mg/dL in controls,  $p=0.013$ .

The other mineral concentrations and urine exertion were the same in both groups and within normal limits.

**Urine calcium** levels were positively correlated with **HOMA** and **insulin** concentrations (see graph 1. and 2.)

**Serum Vitamin D and PTH concentrations were the same** for both groups. Levels of **vitamin D** were below normal range in both groups ( $16.8 \pm 9.3$  in PCOS vs  $17.0 \pm 7.6$  in controls  $p=0.53$ )



## Conclusions

1. PCOS patients are characterized by lowered serum levels of calcium which is related to increased urinary calcium excretion.
2. Increased urinary calcium excretion seems to be related to insulin concentrations and insulin resistance in PCOS women and healthy controls.