

# Abstract

**Objective:** To investigate the potential of selected biochemical, endocrine, and metabolic biomarkers for early diagnosis of polycystic ovary syndrome (PCOS) among non-obese women.

**Methods:** A prospective observational cross-sectional study was conducted at three medical centers in Makkah, Saudi Arabia, between July 15 and September 20, 2017. Eligible participants were non-obese women diagnosed with PCOS according to the Rotterdam criteria (n=44) and non-obese normo-ovulatory women without signs of PCOS (control group; n=44). Anthropometric variables related to metabolic profile were determined. Laboratory measures were assessed using fasting blood samples.

**Results:** Waist circumference and waist-to-hip ratio were increased among women with PCOS (both  $P < 0.001$ ). When compared with the control group, patients in the PCOS group exhibited increases in cholesterol (13.8%), triglycerides (36.6%), low-density lipoprotein (73.2%), fasting glucose (9.2%), fasting insulin (49.4%), luteinizing-hormone/follicle-stimulating-hormone ratio (205.3%),  $17\beta$ -estradiol (39.2%), testosterone (202.3%), and vascular endothelial growth factor (241.7%) (all  $P < 0.001$ ); and decreases in high-density lipoprotein (-25.3%), progesterone (-7.4%), and sex hormone-binding globulin (-54.0%) (all  $P < 0.001$ ). Vitamin D ( $P = 0.095$ ) and Kisspeptin ( $P = 0.944$ ) levels did not differ between the groups.

**Conclusion:** Various parameters could potentially be used as biomarkers to assess risk of PCOS, even among symptom-free non-obese women.

**Keywords:** Estrogen; Kisspeptin; Lipid profile; Non-obese; Polycystic ovary syndrome; Vascular endothelial growth factor; Vitamin D.

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