Polycystic ovary syndrome (PCOS) is the most common cause of infertility in women and insulin resistance plays an important role in its etiology. Recently, according to the pleiotropic action of vitamin D (vit. D), it is some evidence that vitamin D deficiency and its gene receptor polymorphisms can be involved in the etiology of insulin resistance and metabolic disorders in women with PCOS. Several studies have shown a positive association of serum 25 (OH)D levels with serum levels of androgens and SHBG, however, the observations are controversial. Vitamin D deficiency (serum levels lower than 20,000 ng/ml) is mostly associated with Body Mass Index and associated with insulin resistance. Our data included 140 women with PCOS and 100 homogenous healthy controls. We found that the serum 25 (OH)D were negatively correlated with BMI, waist circumference, serum glucose, insulin, HOMA, and positively with HDL cholesterol levels, and supporting several other studies. VDR regulates more than 3% of the human genome including genes that are crucial to glucose metabolism. It has been shown that VDR-related polymorphisms (Cdx2, Bsm-I, Fok-I, Apa-I, and Taq-I) are related to vitamin D metabolism and may contribute to PCOS susceptibility. In our study of 140 women with PCOS, we didn't find any statistically significant differences in the frequency of VDR genotype in polymorphisms Bsm-I, Fok-I, Apa-I, and Taq-I compared to healthy controls, but our data suggest potential role of genotype GT of rs7975232 (Apa-I) in hyperandrogenism in women with PCOS. Special request to: Anna Arkowska, ?ukasz ?aczma?ski, Agnieszka Lenarcik-Kabza, Justyna Kuliczewska-P?aksej, Katarzyna Kolackow, Anna Trzmiel-Bira, Anna Brona, Urszula Dorobisz, Lidia Hirnle, Felicja Lwow.