

# Comparison of Lipid Profile in Women Suffering From Polycystic Ovarian Syndrome and Healthy Women

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## Abstract

The prevalence of Polycystic Ovarian syndrome is very common nowadays. In this syndrome there is marked decrease in the female characters with irregular or no menstruation, excess hairs on face, chest, stomach, thumbs, or toes, decrease in breast size, hair loss, acne, depression, weight gain, pelvic pain and infertility. It affects mainly the females of reproductive age. If left untreated, may result in infertility and even uterine cancer. Very little is known about status of lipid profile in this syndrome so the objective of the study was to compare lipid Profile in women suffering from polycystic ovarian syndrome and healthy women. The study comprised of 200 women of same reproductive age. Out of which 100 were healthy women and 100 were women suffering from polycystic ovarian syndrome. Lipid Profile was tested on auto analyzer by available commercial kits. Student t test were applied to determine difference between the two. SPSS software 20.0 was used for statistical analysis. We found the women suffering from polycystic ovarian syndrome had dyslipidemia as comparison to healthy women. This shows that dyslipidemia can be a risk factor for developing polycystic ovarian syndrome

**Keywords:** Dyslipidemia, Polycystic Ovarian syndrome, Healthy women.

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## INTRODUCTION

Polycystic ovarian syndrome (PCOS) is the most common endocrine disorder among women of reproductive age groups and is defined as a hormonal disorder characterized by the presence of at least one polycystic ovary (presence of multiple cysts) accompanied by ovulatory dysfunction and excessive secretion of androgens[1]. World Health Organization (WHO) estimates that PCOS has affected 116 million women (3.4%) worldwide in 2012[2]. Globally, prevalence estimates of PCOS are highly variable, ranging from 2.2% to as high as 26% [3]. In India, experts claim 10% of the women to be affected by PCOS and yet no proper published statistical data on the prevalence of PCOS in India is available. These variations are due to difficulties in hormonal evaluation and lack of consensus on diagnostic criteria (3 ).It is one of the leading causes of poor fertility [4]. PCOS is associated with a wide spectrum of presenting features, including an ovulation obesity and abnormal facial and skin hair growth (hirsutism)[5,6]. Women with PCOS are at an increased risk for infertility, preeclampsia, early pregnancy loss, and endometrial cancer. Moreover, because of the association of PCOS with insulin resistance, evidence suggests that women with PCOS are at an increased risk for developing type-2

diabetes, dyslipidemia, hypertension, and heart disease[7].The cysts are not harmful but lead to hormone imbalances [8 ].Risk factors include obesity, not enough physical exercise, and a family history of someone with the condition during this pubertal transition, several features may be in evolution and thus many findings may be transitory which stabilize later during adolescence [9].So, the main objective of the study was to compare lipid Profile in women suffering from polycystic ovarian syndrome and healthy women.

## METHODOLOGY

This cross sectional study is comprised of 200 women of same reproductive age. Out of which 100 were healthy women and 100 were diagnosed women suffering from polycystic ovarian syndrome, between the ages 18-38 years. The informed and written consent was taken prior to study. Endocrine disorder, diabetes mellitus, hepatic, renal and heart diseases, pregnant and lactating women were excluded from the study.

Demographic variables including age, education, inhabitant re, history of infertility, and family history were also collected. Anthropometric parameters such as weight, height, BMI, SBP and DBP were also measured.

After 12 hours of fasting, venous blood samples were obtained. Lipid Profile were measured between the two groups. The TG level was measured by using the standard lipase-glycerokinase-glycerophosphate oxidase end point method using commercial kit from reckon Diagnostics. The HDL was measured by modified polyvinyl sulfonic acid and polyethylene glycol methyl ether coupled classic precipitation end point method using commercial kit from Erba Diagnostics. Total cholesterol was measured cholesterol oxidase peroxidase method end point method. The diagnosis of PCOS was established in accordance with Rotterdam 2003 criteria 2003.

Student t test were applied to determine difference between the two. SPSS software 20.0 was

used for statistical analysis. P value less than 0.05 was considered as statistically significant.

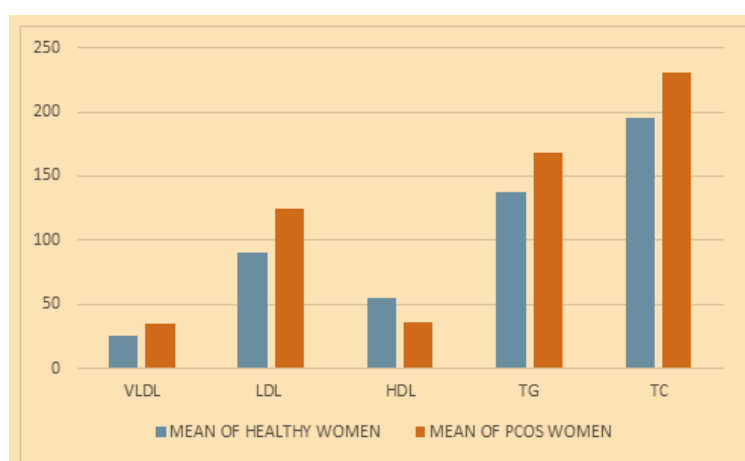
## DISCUSSION & RESULTS

This study showed that there was disturbed lipid profile in women with pcos as comparison to healthy women. Triglyceride level and total cholesterol level were highly significantly ( $p < 0.001$ ) raised in women with PCOS as comparison to healthy subjects. HDL level were also statistically ( $p < 0.05$ ) decreased in women with PCOS as comparison to healthy subjects. LDL and VLDL levels were also statistically ( $p < 0.05$ ) increased decreased in women with PCOS as comparison to healthy subjects. These findings were shown below in Table no 1 and Graph no 1.

**Table-1: Showing the comparison of lipid profile in between healthy women & women with polycystic ovarian syndrome**

Parameters(mg/dl)	Mean of healthy women	Mean of PCOS women	P value
VLDL	25.11±2.01	35.11±5.01	<0.05*
LDL	90±10.55	125±32.34	<0.05*
HDL	55±5.2	35.51±4.61	<0.05*
TG	138±10.45	168±20.45	<0.0012**
TC	195±25.05	230.67±25.05	<0.01**

\*statistically significant, \*\* highly significant



**Graph-1: Showing the status & comparison of lipid profile in between healthy women & women with polycystic ovarian syndrome**

Our findings were in accordance with the findings of Zahiri *et al.* [10], Varghese *et al.* [11], Sharma and Majumdar [12]. Dyslipidemia in women with PCOS may be due to associated environmental factors include physical inactivity, obesity, and its associated insulin resistance [13]. Insulin resistance which is of high prevalence in the Indian population (13) has been consistently reported as a strong determining factor for the occurrence of PCOS in Indian adults and adolescents [14].

In pre-menopausal and postmenopausal ages, this syndrome can increase the risk of type 2 diabetes, hypertension, dyslipidemia, cardiovascular diseases and even endometrial cancer and possibly breast cancer

[15]. In total, 30 to 40 percent of women with PCOS have experienced impaired glucose tolerance or diabetes before age 40. Patients with PCOS are at risk for a group of metabolic disorders including insulin resistance, glucose intolerance impairment, diabetes, hypertension, lipid disorders, cardiovascular disease, and increased risk of endometrial, uterine, and breast cancers. PCOS is a heterogeneous disorder in which both increased ovarian androgens and possibly adrenal and some degree of metabolic disorders exist [16]. PCOS is not only an endocrine- reproduction disease, but also is a metabolic disorder. Obesity is a consistent feature of PCOS seen in 40-50% of patients and has an increasing and synergistic effect in the emergence of PCOS and exacerbates the existing endocrine disorders

[17]. It seems that increase in PCOS symptoms with age increase is associated with accumulation of adipose tissue. About 1:3 obese patients experience PCOS and impaired glucose tolerance and 7.5 to 10% experience type II diabetes. Android central obesity is presented as a risk factor for PCOS which increases the probability of insulin resistance and type II diabetes which result in altered lipid profile [18]. This explains why lipid profile is associated with risk of developing PCOS.

## CONCLUSION

Women suffering from polycystic ovarian syndrome had characteristic dyslipidemia as comparison to healthy women. This shows that dyslipidemia can be a risk factor for developing polycystic ovarian syndrome. So, controlling raised and altered lipid profile can prevent risk of polycystic ovarian syndrome.

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