

## PREVALENCE OF THYROID DISORDER IN WOMEN WITH POLYCYSTIC OVARIAN SYNDROME (PCOS)

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### Abstract

The study aimed to observe the prevalence of thyroid disorders in women with PCOS. It is a prospective observational study design; with this method, the researcher selected 32 samples from attending the gynecology ward at Banjara Hills, Hyderabad Care Hospital. Physical observation and thyroid levels were checked to assess the knowledge and prevalence of thyroid disorders in women with PCOS. The result showed that the age distribution in all PCOS subjects was six girls aged < 19 years old and 26 women aged >20 years, and the prevalence of thyroid disorder in all PCOS subjects was 21.87% (7 issues) with Thyroid disorders, and 78.13 % (25 points) were without thyroid disorders. Hypothyroidism is prevalent in PCOS women. Likewise, the existence of hypothyroidism and PCOS can lead to worsening symptoms in patients. Conducting thyroid function tests in PCOS aids the patient in ruling out hypothyroidism, which can minimize other difficulties and thereby boost overall well-being.

**Keywords:** Prevalence, Polycystic Ovarian Syndrome, Gynaecology.

### 1. INTRODUCTION

Thyroid disorder is a health condition where thyroid function is affected. It is situated at the frontal part of the nape. It resembles a butterfly in shape and consists of bulbous right and left lobes connecting in the midline by a thin structure called an isthmus. [1] which is situated in the nape with thyroid wraps throughout the anterior trachea directly lesser to the larynx, at the level of C5 through T1 vertebrae. [2]

The functions of thyroid hormones include basal metabolic rate increase depending on the metabolic status; it also can induce lipolysis or lipid synthesis and stimulate the metabolism of carbohydrates and anabolism of proteins. The thyroid hormone is known to cause catabolism of proteins at high doses, with a Permissive effect on catecholamines. In children, thyroid hormones synergistically affect growth hormones to stimulate bone growth. The impact of thyroid hormone in CNS is significant. During the prenatal period, thyroid hormone is required for brain maturation. In adults, it can

Influence mood. [3] The thyroid hormone affects fertility, ovulation, and menstruation. The thyroid gland is the primary endocrine organ formed during fetal development. [4] Two types of hormones that are secreted by the thyroid gland are 1. Triiodothyronine (T3) 2. Thyroxine(T4) is categorized into five classes, each having clinical features. An individual can show one or more categories simultaneously. It includes hypothyroidism, hyperthyroidism, goiter, and tumors. Generally, there are four subtypes of tumors: - 1) Those developing from follicular epithelium include papillary thyroid carcinoma 85%, follicular carcinoma (5-15%), and anaplastic carcinoma

**Polycystic ovary syndrome (PCOS)** polycystic ovarian syndrome is a hormonal imbalance affecting the female population of fertile age marked by raised testosterone levels, menstrual abnormalities, and cysts in the ovaries. [5] This complication can also be anatomical, consisting of polycystic ovaries, or biochemical, including hyperandrogenism. Hyperandrogenism is an essential symptom of PCOS, which can lead to obstruction of follicular development, cyst formation in the ovaries, absence of ovulation, and menstrual changes.

PCOS is a group of disorders that generally alters no less than 7% of adult women. Research indicates that 5% to 10% of females aged 18-44 years suffer from PCOS, a frequent endocrinal dysfunction in women of fertile age. The female population suffering from PCOS had more chances of uterine cancer, congestive heart failure, Hyperlipidaemia, and Type 2 DM. [6] PCOS is a situation that leads to many ailments and is also known to affect fertility in women. Pathogenesis of PCOS includes deficiency in the hypothalamus, insulin release and its effect, and ovarian function. [7][8] Although the origin of PCOS is not noticed, PCOS is known to be related to impaired insulin sensitivity and overweight. The correlation on insulin role is expected; insulin facilitates the management of ovarian function, and the female gonads react to more insulin by generating androgens that can result in anovulation. Follicular growth trademark signs that ovarian abnormality exists. [7]

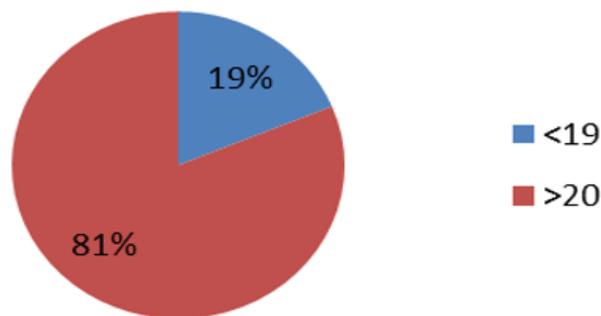
**Thyroid disorders in PCOS** women and their relationship with the association between Thyroid and PCOS are increasingly being recognized as the prevalence of endocrine abnormalities rises. These are the prevailing endocrinal abnormalities in the overall population. In PCOS women, there is an alteration in ovary size and appearance of cysts in hypothyroidism. It is mainly observed that thyroid abnormalities are frequent in females suffering from PCOS as related to the overall population. These two endocrine abnormalities have similar traits despite the pathogenesis of PCOS, and thyroid abnormalities are entirely different. [8-12] The pathologies associated with these two abnormalities have not been evident till now. The obvious connection is increased body weight and impaired insulin sensitivity, which are common in both disorders. A rise in body mass index is observed in the significant population 58-68% of this condition. However, there is sufficient proof that TSH is elevated in patients with raised BMI. [13-14] Thyroid dysfunction is linked with changes in several metabolic processes. Early stages of disorders of the thyroid can lead the way to subtle alteration in ovulation and endometrial receptivity, which may have profound action on fertility if not treated. It may cause a delay at the beginning of puberty, followed by anovulatory cycles. Even subclinical hypothyroidism can result in fertility adversely. Elevated estrogen and estrogen/ progesterone are directly associated with elevated antithyroid peroxidase levels in PCOS patients.[15] Both genetic and environmental factors are trusted to be contributing to disorders of the thyroid in PCOS. Hyperthyroidism is known to cause PCOS and overall aggravated PCOS.

## 2. STUDY METHOD

It is a prospective observational study design; with this method, the researcher selected 32 samples from attending the gynecology ward at Banjara Hills, Hyderabad Care Hospital. Physical observation and thyroid levels were checked to assess the knowledge and prevalence of thyroid disorders in women with PCOS.

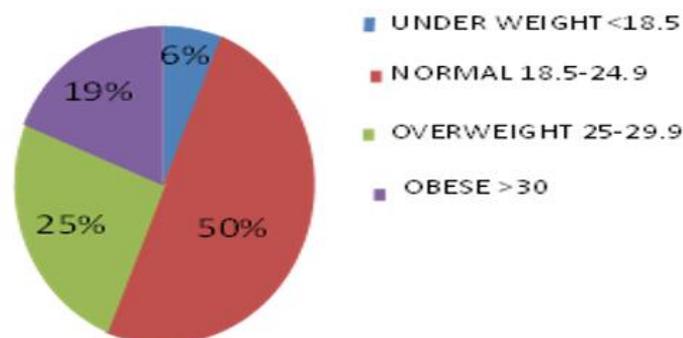
### 3. RESULTS

The study showed that most women with normal thyroid levels had PCOS symptoms. Among 32 samples, most women suffered from acne and hirsutism, and the result concluded that only 21% of women have a thyroid disorder.



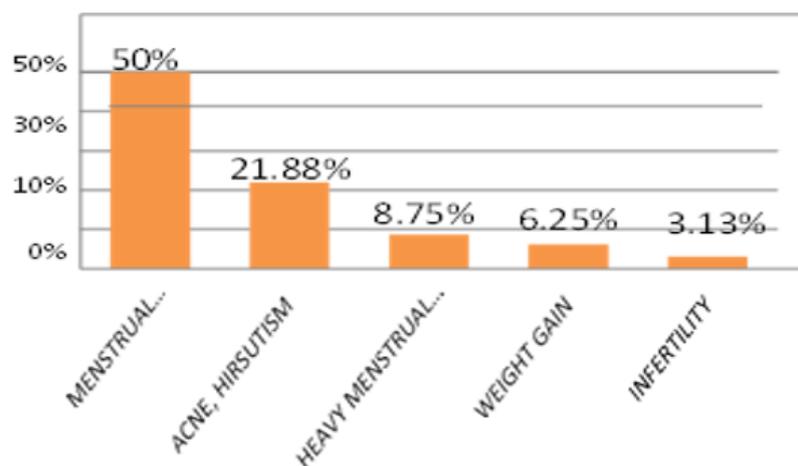
**Figure 1: Age distribution in all PCOS subjects**

Figure 1 indicates age distribution in 32 PCOS women; there were 6 Girls of adolescent age (20).



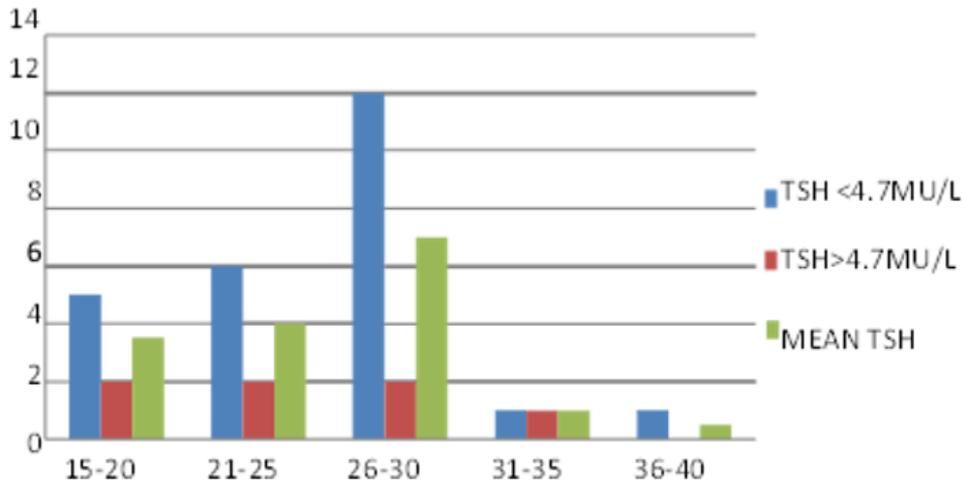
**Figure 2: Body Mass Index (BMI) for all subjects**

Figure 2 shows the BMI distribution among all subjects: 6.25% of women were underweight, 50% were normal, 25% were overweight, and 18.75% were obese.



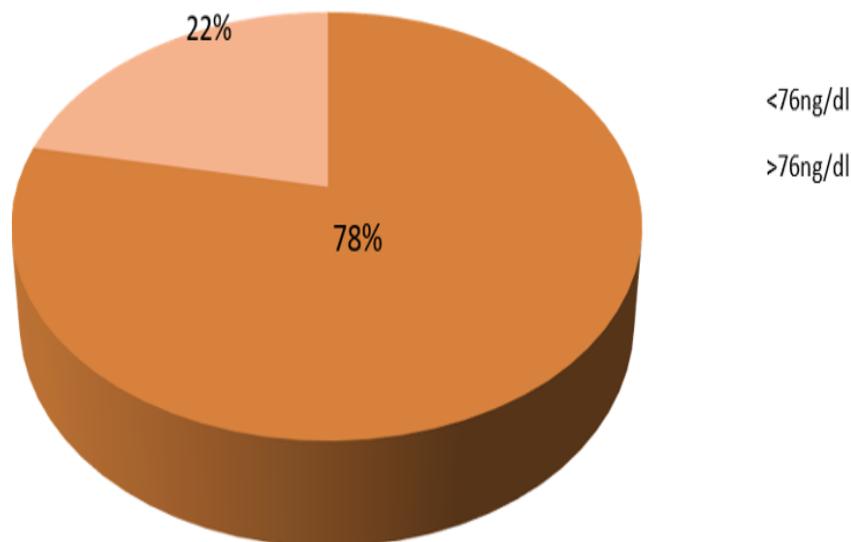
**Figure 3: Presenting complaints of all subjects**

Figure 3 shows the distribution of different major and minor complaints. 50% of women had menstrual irregularities, 22% of women had acne hirsutism, 9% of women had heavy menstrual bleeding, 6% of women came with complaints of weight gain, and 3% of women had infertility.



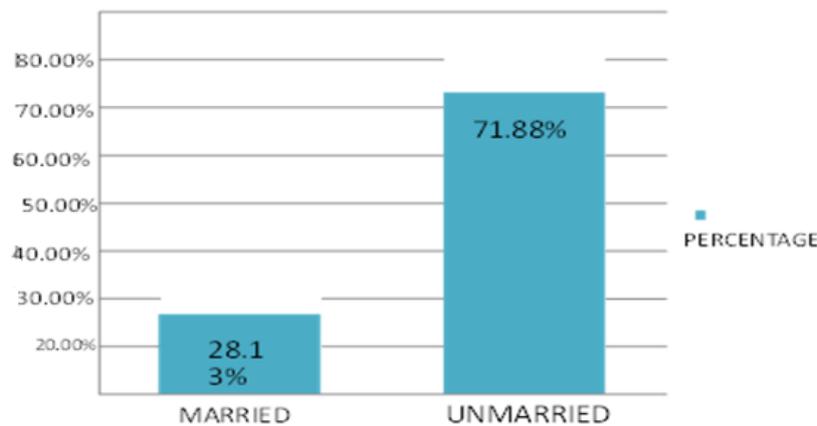
**Figure 4: Distribution of serum TSH in different age groups**

Figure 4 shows the distribution of serum TSH in different age groups (15-40 years); elevated TSH was observed in the age group of 26-30 years compared to others.



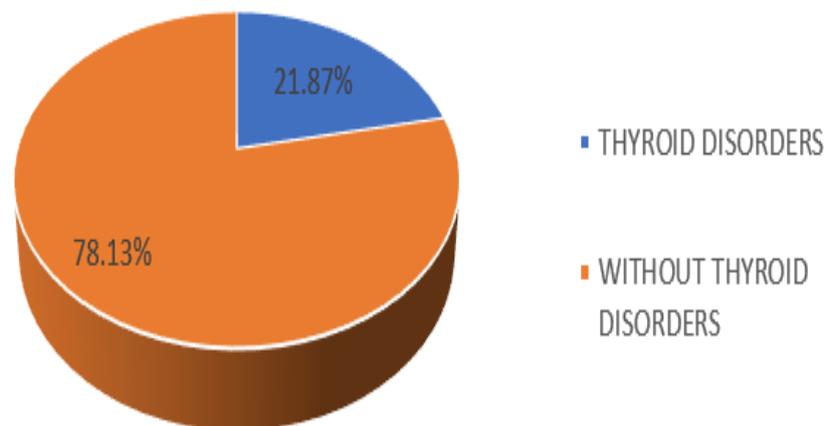
**Figure 5: Serum testosterone levels in all subjects**

Figure 5 shows the percentage of all subjects within the reference range of testosterone (Thyroid disorders and the other 78.13 % (25 subjects) were without Thyroid disorders.



**Figure 6: Distribution of marital status in all subjects**

Figure 6 shows marital status distribution in all subjects, where 28.13% (9 subjects) were married, and 71.88% (23 subjects) were unmarried.



**Figure 7: Prevalence of thyroid disorder in all subjects**

Figure 7 shows the prevalence of thyroid disorder in all PCOS subjects, where 21.87% (7 subjects) had thyroid disorders, and 78.13% (25 subjects) were without thyroid disorders.

#### 4. DISCUSSIONS

As the prevalence of infertility and its morbidity has recently increased, the root cause must be identified and treated accordingly. The leading causes of female infertility, in addition to anatomical and genetic defects, are menstrual disorders. The main factors contributing to this menstrual irregularity are local (ovarian) causes such as polycystic ovarian syndrome and systemic causes such as hypothyroidism, hyperprolactinemia, and hyperinsulinemia. All of the factors listed above create an individual risk of anovulation. They frequently appear in combination. PCOS and hypothyroidism are primarily seen in young women. A common finding in the Gynaecology department is that during several months of treatment for PCOS patients, menstruation and ovulation are restored in some patients while remaining not corrected in others. Upon further evaluation, patients failing therapy for other causes of infertility/menstrual disorders

were diagnosed with concomitant hypothyroidism, most of which went undiagnosed and untreated.

These individuals were primarily subclinical, and some were hypothyroid. Screening helps assess the prevalence of hypothyroidism and provides information about the epidemiology of this condition in the population. However, research comparing thyroid status in women suffering from PCOS is very limited across all parts of India. With this in mind, we conducted this study to assess the functioning of the thyroid gland in patients diagnosed with PCOS. An observational study was done on 32 PCOS women attending the Gynaecology and obstetrics outpatient department dealing with menstrual disorders and infertility. They were diagnosed using revised Rotterdam criteria. Serum TSH concentration of 4.7 IU/ml was the cut-off point for diagnosis of hypothyroidism; we observed the occurrence of hypothyroidism in 32 PCOS women to be approximately 22% (7 patients among all 32 participants).

## 5. CONCLUSION

Hypothyroidism is prevalent in PCOS women. Likewise, the existence of hypothyroidism and PCOS can lead to worsening symptoms in patients. Conducting thyroid function tests in PCOS aids the patient in ruling out hypothyroidism, which can minimize other difficulties and thereby boost overall well-being. Most polycystic ovary cases are accompanied by thyroid dysfunction and spatial hypothyroidism associated with ovarian enlargement or oocyte formation; PCOS is critically affected in young women under 25. Also, continuous monitoring for all thyroid profiles, even TSH in the reference range. Weight gain causes specific hormonal disorders; Obesity may be a critical factor in thyroid dysfunction. We need more research to get results on the causes of PCOS.

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