Journal Homepage: - www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI: 10.21474/IJAR01/9966
DOI URL: http://dx.doi.org/10.21474/IJAR01/9966

RESEARCH ARTICLE

A STUDY OF ESTIMATION OF TSH,PROLACTIN, FSH AND LH HORMONE LEVELS IN PCOS.

Dr. K.Venkateswarlu[1] and Dr. A. Padmavijayasree[2].
1. Assistant professor , Department of Biochemistry, Kurnool Medical College, Kurnool, Andhra Pradesh, India.
2. Professor and Head of Department of Biochemistry, Kurnool Medical College, Kurnool Andhra Pradesh, India

Manuscript Info

Manuscript History
Received: 18 August 2019
Final Accepted: 20 September 2019
Published: October 2019

Key words:-
Polycystic ovarian syndrome(PCOS), hormonal profile. TSH, LH, FSH ,Prolactin.

Abstract

Background: Polycystic ovary syndrome (PCOS) is a common endocrine condition affecting women of reproductive age and characterized by chronic anovulation, hyperandrogenism, and polycystic ovaries. PCOS patients usually develop thyroid disorders which have an adverse effect on fertility and other hormones. Hence this study was done to estimate levels of TSH , LH, FSH, and Prolactin.
Aims &Objectives: To study levels of TSH , LH, FSH, and Prolactin and to compare it with healthy matched controls
Materials & Methods: The study was conducted in Department of Biochemistry ,Kurnool Medical College and Department of Obstetrics & Gynaecology , Government General Hospital , Kurnool
Results: The PCOS group exhibited significantly higher mean thyroidstimulating hormone level , luteinizing hormone level.The study showed that LH is raised in PCOS with p value of 0.0001 which is statistically significant. The ratio of LH/FSH was more than 2:1in cases. and a non-significantly higher follicle-stimulating hormone level than the control group. Prolactinlevels were normal.
Conclusion: The findings of the study showed that PCOS is associated with hypothyroidism and other hormonal imbalance as compared to normal population. So Hormonal dysfunctions in PCOS manifested together or independently. PCOS women can be sub grouped based on clinical features suggestive of endocrinological malfunctions and can be investigated accordingly for selection of appropriate treatment modalities.

Introduction:-

Polycystic ovary syndrome (PCOS) is the most common endocrinopathy in reproductive age women. Polycystic ovary syndrome (PCOS) is also called hyperandrogenic anovulation (HA) or Stein– Leventhal syndrome is characterized by menstrual and hormonal irregularities resulting in anovulation, infertility, and hyperandrogenism ,signs of metabolic disturbances like insulin resistance, and dyslipidemia . It affects approximately 5% to 10% of 18 and 44 age group [1]. Diagnostic Criteria: In 2006, the Androgen Excess PCOS Society suggested a tightening of the diagnostic criteria to all of the following: 1. excess androgen activity 2 . oligoovulation/anovulation and/or polycystic ovaries 3. exclusion of other entities that would cause excess androgen activity. [2].PCOS associated with obesity, menstrual irregularity, early pregnancy loss ,infertility, acne , hirsuitism women are vulnerable to type II diabetes, dyslipidemia, premature arteriosclerosis, and endometrial carcinoma, treatment of PCOS should also aim to search these

Corresponding Author:-Dr. K.Venkateswarlu.
Address**:**-Assistant professor , Department of Biochemistry, Kurnool Medical College, Kurnool, Andhra Pradesh, India.

abnormalities [3].On this background the aim of this study was to assess a status of TSH,PROLACTIN ,FSH AND LH Hormone in subjects with polycystic ovarian syndrome.

Methodology:-

Study population

The study was carried out in Department of Biochemistry ,Kurnool Medical College and Department of Obstetrics & Gynaecology , Government General Hospital , Kurnool .The study period was from June 2018 to March 2019 after institutional ethical committee approval. A total of 100 patients of age group 17 - 40 years were studied of which 50 were cases and 50 controls. The patients were included if they satisfied the diagnostic criteria suggested by Androgen Excess PCOS Society. And 50 age matched normal regular menstruating women were taken as controls. Exclusion criteria for cases were patients with hypothyroidism, Diabetes mellitus, Hypertension, hyperandrogenism; such as androgen secreting tumours and congenital adrenal hyperplasia, hyperprolactinemia, cardiovascular disease, hormonal contraceptives or other type of medication that may have affected lipid profile and carbohydrate metabolism, smokers or drinkers. All details of study were explained to the subject and informed consent was taken. Clinical examination was done as per the proforma.

sample collection

After overnight fasting, samples were collected in the morning on 3rd day of menses. The samples were left standing for one hour and then serum was separated by centrifugation at 3000 rpm for 10 minutes. The samples were analyzed on by Chemiluminiscence immunoassay (CLIA) method using a Beckman Coulter Access2 fully automated analyser. in Department of Biochemistry .GGH,Kurnool, for FSH, LH Prolactin and TSH levels.

Normal levels of FSH is 3-20 mIU/ml, LH< 7mIU/ml , TSH 0.4-4 uIU/ml , Proiactin< 24 ng/ml on 3 rd day of menses.

Statistical analysis:-

Statistical analysis was carried out on Microsoft excel. Continuous parameters were expressed as mean ±SD was applied to the data. Pearson correlation was used to correlate LH and TSH, FSH and TSH. P value< 0.05 was considered statistically significant.

Results:-

During the 9 month study period from June 2018 to March 2019 a total of 100 patients were studied of which 50 and 50 were controls who were normal females without any diseases in age group of 17-40 years.Levels of hormones in cases and controls LH levels are significantly raised in cases with p < o.oo1.There is no significant difference between Prolactin levels in cases and controls.(p =0.2)TSH levels are significantly raised in cases with p < 0.0001.This shows that as LH increases .TSH also Increases in PCOS patients. (Table 2, Chart 1) FSH levels 7.6±4.5 are as compared to 5.5±2. mIU/ml in controls.p< 0.006.Prolactin levels are normal in both groups.(p= 0.2)

Table 1:-Descriptive statistics for variables in the cases and controls

Variables	**PCOS Mean±SD**	**Control Mean±SD**	**P value**	Significance
TSH (mIU/ml)	6.24±2.05	2.4±0.75	<0.0001	statistically significant.
LH(mIU/ml)	17.2±13.2	5.7±1.6	<0.0001	statistically significant
FSH(mIU/ml)	7.6±4.5	5.5±2.9	0.006	statistically significant
PROLACTIN(ng/ml)	12.6±9.4	10.53±8	0.2	Notstatistically significant

Table 2:-Luteinizing Hormone/Follicle-Stimulating Hormone Ratio In The Cases And Controls

PARAMETER	PCOS	CONTROL
LH/FSH RATIO	74%	26%

Figure 1:-Hormonal Levels In Cases And Controls

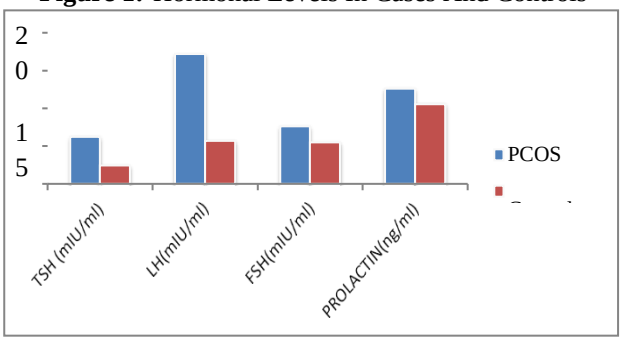
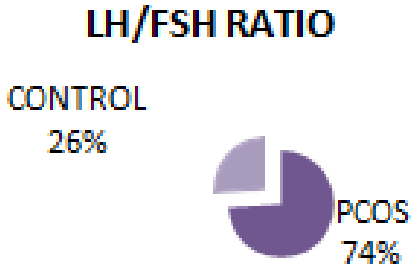


Figure 2:-Lh/Fsh Ratio In The Cases And Controls



Discussion:-

Our study showed that women with PCOS have higher TSH levels and are also more likely to have subclinical hypothyroidism when compared to age-matched controls without PCOS. The findings of the present study are similar to those of other studies. Dahiya et al also found raised levels of TSH in PCOS patients[4].Ghosh, et al. tried to evaluate the role of hypothyroidism in the causation of PCOS[5]. Kedar KV et al. studies shows that PCOS is associated with hypothyroidism [6] ·Moustafa MM et al concluded that most patient with PCOS will have some degree of thyroid dysfunction [7]. Wakim, et al. in their research on human reproductive biology also reestablished the hypothesis that hypothyroidism worsens PCOS by further decreasing sex hormone binding globulin levels, increasing the conversion of androstenedione to testosterone and aromatization to estradiol and reducing the metabolic clearance rates of androstenedione and estrone. Since thyroid hormones are involved in the gonadotropin induced estradiol and progesterone secretion by human granulosa cells, hypothyroidism would interfere with ovarian function and fertility.High level of testosterone contributes to PCOS symptoms like infertility, polycystic ovaries, hirsutism, male pattern hair loss and acne [8]. Thyroid responsitivity by the ovaries could be explained by the presence of thyroid hormone receptors on human oocytes. TSH also affects estrogen metabolism, decreases the production of sex hormone binding globulin and increases free testosterone [(9,10,11] This increased estrogen may increase the levels of thyroid binding globulin and mask the activity of free thyroid hormones. Thus, the clinical features of hypothyroidism overlap with features of PCOS [12]. In our study mean serum LH was significantly higher than mean serum FSH in PCOS women compared with control subjects.The ratio is more than 2.Increased LH and decreased or normal FSH are due to (a) GnRH pulsatile secretion, i.e. at hypothalamic level. (b) high estrogen environment, i.e., at pituitary level .[13]This has been also seen in other studies- Nath , et al. found raised LH/FSH ratio in 70.58% of their patients [14] . Gulab kanwar et al studies shows that The ratio of LH/FSH was more than 2:1in cases .**[15]**

Conclusion:-

Based on findings of our study we conclude that PCOS is associated with high incidence of thyroid disorders and disturbances in reproductive hormone. .This points towards the importance of early correction of hypothyroidism in the management of infertility associated with PCOS. All women with PCOS should have their thyroid function tests and hormonal tests evaluated thoroughly for better outcome of results.

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