WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 5.990
Volume 4, Issue 7, 2254-2260. Research Article ISSN 2277– 7105

# IMPORTANCE OF SCREENING OF PRL &TSH IN PRIMARY INFERTILE WOMEN

**S.A.Meenakshi*[1], S.Kalavathy[2] and S.Kavitha[3]**

[1]Departmentof Biochemistry, SR College, Tiruchirappalli.

[2]Department of Botany, Bishop Heber College, Tiruchirappalli.

[3]Gynaecologist, Pankajam Sitharam Nursing Home 24hrs Infertility Centre, Trichy.

Article Received on
12 May 2015,

Revised on 07 June 2015,
Accepted on 06 July 2015

***Correspondence for Author**
**S.A.Meenakshi**
Department of Biochemistry, SR College, Tiruchirappalli.

## ABSTRACT

The aim of the study was to investigate the correlation of hyper Prolactinemia and Hypothyroidism in the study group. The study was performed on 54 women consisted of 32 infertile women (patients), age ranged 20-40 years old, and 22 fertile women as control of the same age group in Pankajam Sitharam Nursing Home,Infertility centre,Trichy.Serum prolactin (PRL) and Thyroid Stimulating Hormone (TSH) were measured using enzymatic immunoassay (EIA) method. Patients were divided into two groups; G1 aged between 21-40 years belonged to fertile group. G2 belonged to infertile group of the same age. Serum PRL levels in the G2 was significantly elevated compared to the G1. Serum TSH was also assayed which was found to be increased in test groups (G2) when compared to control group.

**KEYWORDS:** Prolactin, TSH, primary infertility.

## INTRODUCTION

Infertility is defined as inability to conceive after at least one year of unprotected coitus or/intercourse. 75% of perfectly normal couples will conceive within a period of one year.[11] and 93% within 2 years.[5]

The World Health Organization (WHO) estimates that 60 to 80 million couples worldwide currently suffer from infertility.[12]

The reproductive years of women begin when she starts her menstrual cycle during puberty (about the age 13) years, and the ability to have a child usually ends around 45 years, although it is potentially possible for a women to be pregnant until her periods end with menopause (about the age 51) years.[2]

Born girl carries in her body numerous immature eggs/oocytes. These are stored in her ovaries in fluid-filled sacs called follicles. In her reproductive years, she starts having monthly maturing one egg or more than one (less commonly), which may join with a male motile sperm cell during fertilization and become pregnant.[8]

The development and release of the egg depend largely on a delicate balance of hormones. Some of these hormones are produced in the ovaries, others from the two glands in the brain, the hypothalamus and the pituitary.[4]

Causes of primary infertility include a wide range of physical as well as emotional factors.[6] The normal ovarian cycle is so complex that even small deviations may disrupt the cycle and prevent ovulation.[1] Ovulatory disorders are most often caused by abnormality in one of the controlling hormone.

However, problems can also arise if the ovaries themselves are resistant or non responsive to normal levels of hormones. In addition, absent, damaged or diseased ovaries will prevent ovulation.[3] The principal symptoms associated with ovulatory disorders are: Amenorrhea, Oligomenorrhoea, Irregular menstrual cycle, Obesity, excessive weight loss Galactorrhoea, Hirtism and Acne.[9]

The thyroid dysfunction is prevalent in the population and affects many organs including female gonads, thus interfering with the human reproductive physiology. Prolactin has suppressive effect on the pituitary–ovarian axis and may result in amenorrhea or oligomenorrhea due to anovulatory cycles. Hyperprolactinemia causes reproductive dysfunction, affecting about one third of infertile women.

The aim of the study was to find the occurence of hyperprolactinemia and hypothyroidism in female primary infertility and to study the correlation between them.

## MATERIAL AND METHODS

The Study was conducted in Pankajam Sitharam Nursing Home,Infertility centre,Trichy, on 32 women with primary infertility (aged :20 – 40 years), who had never conceived. 22 women of the same age group with normal menstrual cycle and proven fertility were taken as control. The exclusion criteria were male factor infertility and female tubal factor, any congenital anomaly of urogenital tract, patients with thyroid diseases and those on thyroid medication. The period of study was from Aug 2013 to Feb 2015.

A detailed history was taken, information regarding past oral contraceptive use, lactation, major weight changes, symptoms like headache, visual impairment, drug history, any chest trauma or surgery were elicited. This was followed by general and gynecologic examination. Blood sample was withdrawn for investigations during mid cycle 14 – 16 day.The routine analysis data was collected. Serum prolactins, TSH were measured by enzyme immunoassay on ELISA Reader using kits used for quantitative measurement of TSH and Prolactin in human serum or plasma.[10]

### Statistcal Analysis

The datas were analysed using one way ANOVA (SPSS). P value < .05 was considered statistically significant.

## RESULTS AND DISCUSSION

In the present study, the study group comprised of 54 women of which 32 women were infertile, age ranged from 20-40 years and 22 fertile women as control of the same age group. Out of 32 patients 24 had hyperprolactinemia and 8 had hypothyroidism. The test group showed significant elevation in the level of prolactin and TSH when compared to control group in TABLE-1.FIG-1-A ,1-B showed elevated levels of PRL.TABLE-2 showed majority of test group had hyperprolactonemia i.e 75% and a few i.e 25% had hypothyroidism.The results of hormonal status of women is depicted in fig-2.

**Table I Level of Serum Prolactin and TSH Leves in the Study Group**

| S.No | Group I n=22 control | Group II n=32 Infertile |
|---|---|---|
| Prolactin ng/ml | **11.7±5.9** | **29.071±9.7** |
| TSH µIU/ml | **1.4±1.1** | **3.0±1.6** |

**GI: Normal;**
**GII: Infertile women**

The values are expressed as mean±SD

All the data analysis were done using SPSS version 16.0.. The P value of < .05 was statistically significant.

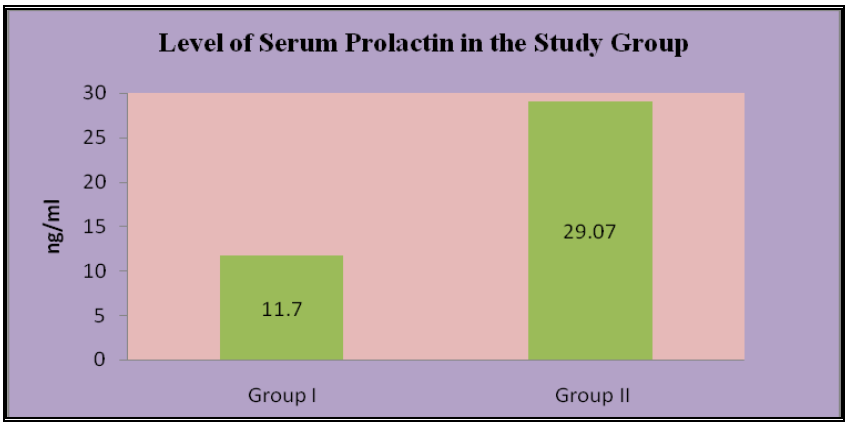


**Figure I – A Level of Serum Prolactin in the Study Group**

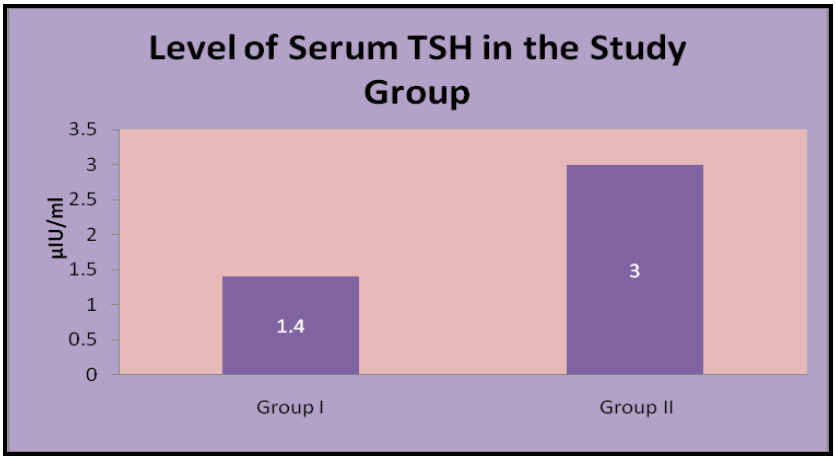


**Figure I – B Level of Serum TSH in the Study Group**

**Table II Hormonal Status of Infertile Women**

| Hormonal Level | Number of Women | Percentage |
|---|---|---|
| Hyperprolactinemia | 24 | 75% |
| Hypothyroidism | 8 | 25% |
| Total | 32 | 100% |

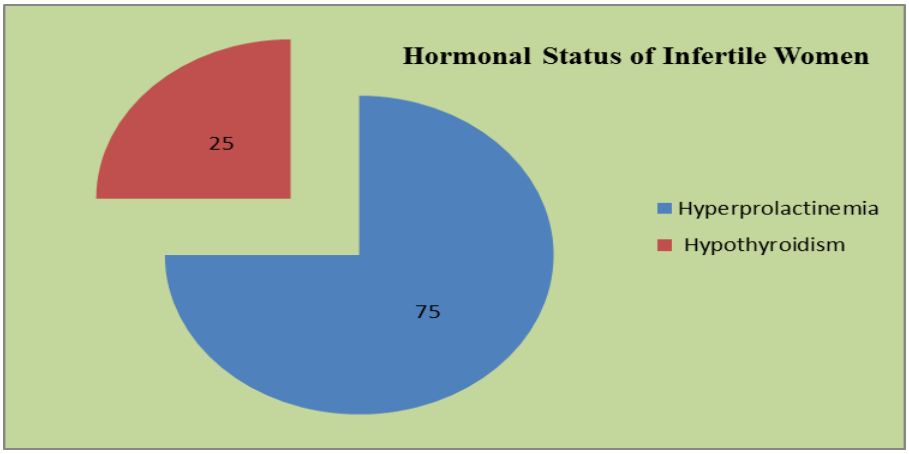


**Figure II Hormonal Status of Infertile Women**

Hyperprolactinemia is a common problem encountered in reproductive disorders. The synthesis of prolactin is done by the lactotrophs in the anterior pituitary gland.[7]

The estrogen and TRH are positive modulators whereas dopamine is a negative modulator of prolactin secretion. Progesterone acts as an inhibitor of prolactin synthesis. A high level of TSH stimulates prolactin secretion and causes ovulatory dysfunction.[11]

A positive correlation is seen between hyperprolactinemia and hypothyroidism. This is due to the fact that Thyrotropin Releasing Hormone(TRH) has similar effect on prolactin gene and thyroid gland and leads to release of both hormones i.e prolactin and TSH.[11] In hypothyrodoism, increased TRH production leads to hyperprolactenemia and altered GnRH pulsatile secretion. This leads to delay in LH response and inadequate corpus luteum leading to abnormal follicular development and ovulation.[13]

Serum prolactin level measurements are mandatory in all infertile women especially those with oligomenorrhea, amenorrhea and anovulation. The relatively high occurrence of abnormal TSH levels in women with ovulatory dysfunction and oligomenorrhea emphasizes the importance of TSH screening in these women.

Hyperprolactinemia is usually associated with menstrual and ovulatory disorders like amenorrhea, oligomenorrhea, anovulation, ovulatory cycles with short or inadequate luteal phase, and galactorrhea. Approximately two thirds of women having both galactorrhea and amenorrhea will have hyperprolactinemia. Estimation of serum prolactin levels is recommended in women with unexplained infertility, any menstrual irregularity, galactorrhea

with or without amenorrhea, luteal phase defects, anovulation, anovulatory bleeding, and delayed puberty.

Apart from these groups of women, infertile women with regular menses also may have hyperproplactinemia. With the determination of serum prolactin levels, greater attention is now been directed to the clinical and laboratory evaluation of hyperprolactinemic women. Some of the women with galactorrhea and hyperperolactinemia might have primary hypothyroidism.

It has been suggested that hypogonadism seen in hyperprolactinemic women is due to circulating levels of prolactin interfering with the action of the gonadotrophins at the ovarian level and impaired gonadal steroid secretion, which in turn alters positive feedback affects at the hypothalmic and pituitary levels. This leads to lack of gonatotrophin cyclicity and infertility. Prolactin can inhibit the follicular estradiol production and this result in infertility.[7]

To conclude, the prevalance of hyperprolactinemia in infertile women is found to be significant. Since 75% of infertile women were found to be with hyperprolactenemia. The result suggests that measurement of PRL & TSH are necessary for screening infertility. Larger population studies are further required for authentication.

**REFERENCES**

1. Al-Inany H. Female infertility, Clin. Evid., 2006; 15: 2465-2487.
2. Balen A. H. and Rutherford A. J. Management of infertility. J. Mol. Biol., 2007; 335: 608-611.
3. Falkenberry S. S. Nipple discharge. Obstet, Gynecol. Clin. North. Am., 2002; 29: 21-30.
4. Gronovski A. M., Fantz C. R., Parvin C. A., Sokoll L. J., Wiley C.L.WenerM.H.and Grenache D. G. Use of serum FSH to identify pre-menopausal women with pituitary hcg,clin.chem., 2008; 54: 652-56.
5. Guttmacher F; Factors affecting normal expectancy of conception. J American Medical Association., 1956; 161: 856.
6. Heinonen P. K., and Pystynen P. P. Primary infertility and uterine anomalies. Fertil.Steril., 1983; 40: 311-317.
7. Kalsum A, Jalali S; Role of hyperprolactenemia in infertility. Pakistan J Med Res., 2002; 41(3): 18.

8. Sanders B. Uterine factors and infertility. J. Reorod. Med., 2006; 51: 169-176.
9. Sensky T. E., and Liu D. T. Endometriosis association with menorraghia, infertility and oral contraceptives. Intnat. J. Gynocol. Obestet., 1980; 17: 573-76.
10. Shome B, Parlow AF; Human follicle stimulating hormone (hFSH): first proposal for the amino acid sequence of the alpha-subunit (hFSHa) and first demonstration of its identity with the alpha-subunit of human luteinizing hormone (hLHa). J Clin Endocr Metab., 1974; 39(1): 199-202.
11. Southam AL; What to do with the normal infertile couple. Fertile Sterile., 1960; 11: 543.
12. World Health Organization. Infecundity, infertility, and childlessness in developing countries. DHS Comparative Reports No 9. Calverton, Maryland, USA: ORC Macro and the World Health Organization;( 2004).
13. Shivaleela M Biradar., Thyroid Dysfunction in Infertile Women. IJPBS (Volume2) Issue 3 /July-Sept/2012/53-58.