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## Research Article

### STUDY AND CORRELATION OF HORMONES IN INFERTILE WOMEN OF KANPUR REGION

Satyanarayana P., Kalpana Verma\*, Pallavi Anand and Singh U.N

Department of Biochemistry, Rama Medical College, U.P

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#### ABSTRACT

**Background:** Infertility is the most gynecological problem which is increasing all over the world. Many studies were done and many theories were proposed in order to find the correlation between Infertility and hormonal imbalance.

**Aim:** the present study was conducted to study the correlation between some hormones, anthropometric parameters and infertility.

**Materials and Methods:** total 80 women were enrolled for the study among them 40 fertile women were chosen as control while 40 infertile women were serving as study group. The study conducted at obstetrics and gynecology out-patient of Rama medical college and Hospital. The primary investigations of infertility were done to all women. Enrolled subject went for the anthropometric measurements. The hormones were measured with CLIA method by Cobas e411

**Results:** The mean serum levels of T3, T4 and TSH in infertile women was found to be lower (1.31±0.43, 9.97±2.37 and 6.27±5.93) in compare to fertile women (2.99±9.97, 8.43±3.19 and 5.19±4.99) and there was a statistical significance found between two study group (p <0.5). The mean serum level of FSH and Prolactin were also significantly lower in case group (6.05±1.11 and 12.68±9.46) in compare to healthy subjects (6.85±3.08 and 17.37±5.87) while LH was found to be significantly higher in infertile women.

**Conclusion:** Different hormones such as FSH, LH, Prolactin, TSH, T4, T3, and Anthropometric factors such as BMI and weight play a role in pathogenesis and different mechanisms of infertility.

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#### INTRODUCTION

Infertility is a disability to conceive after one year of unprotected sexual intercourse (American society of reproduction and medicine) (1). Infertility is a global public health concern this is partly due to its complexity in aetiology as well as difficulty in preventing, diagnosing and treating it (2). It could be either primary or secondary infertility. Human infertility is a complex problem may include female factor or male factor or both. The main causes of female infertility include pelvic inflammatory disease (PID), advanced age, polycystic ovarian syndrome, congenital abnormalities and most importantly hormonal imbalance [3-4]. The main hormones that play role are thyroid hormones, prolactin, FSH and LH.

Thyroid hormones have significance effect both on reproduction and pregnancy. Thyroid dysfunction is implicated in a broad spectrum of reproductive disorders, ranging from abnormal sexual development to menstrual irregularities and infertility (4). Hypothyroidism is associated with increased

production of TRH, which stimulates pituitary to secrete TSH and PRL. (5)

Prolactin is polypeptides hormone. It acts with estrogen in secondary sexual characteristics. Its primary function is to enhance breast development during pregnancy and to induce lactation [6]. Any disturbance in its level may be due to pituitary macro or micro adenoma, oral contraception, lactation, thyroid diseases, breast surgery, renal problems and stress can cause menstrual irregularities and infertility.

FSH and LH are a glycoprotein hormones secreted from anterior lobe of pituitary to stimulate oocyte growth, estrogen secretion and endometrial growth while LH helps ovulation and increases endometrial secretion under effect of progesterone. Estrogen and progesterone both are secreted from granulosa and luteinized granulosa cells of ovary respectively. (7)

The aim of the present study is to assess the levels of serum prolactin thyroid hormones FSH and LH in study population and to find the possible correlation of these hormones in infertility.

\*Corresponding author: Kalpana Verma

Department of Biochemistry, Rama Medical College, U.P

## MATERIALS AND METHODS

A total of 80 women in the age group of 20 to 40 years from Kanpur region were enrolled in the present study. Among them 40 fertile women were chosen as control while 40 women with the diagnosed case of infertility were serving as study group. The study was conducted at obstetrics and gynecology outpatient of Rama medical college and Hospital. Ethical approval was obtained from the ethics committee of the institute. A standard questionnaire was administered to them and their consent to participate in the study obtained.

### Exclusion Criteria

- Female with any other reproductive disorder
- Husband have any reproductive disability
- Female below 20 and above 40-year group

**Sample Collection:** 5 ml of Venous blood was collected in aseptic conditions by venipuncture and dispensed into clean plain bottles, allowed to clot and centrifused for 10 mts at 3000 RPM. Serum separated and used for the assessment of following biochemical parameters.

**Prolactin:** by chemiluminous method.

**Thyroid Profile:** T<sub>3</sub>, T<sub>4</sub>, TSH by chemiluminous based method  
FSH by Chemiluminous based method.

All the parameters were measured in a fully auto analyzer (Cobas e411)

### Statistical Analysis

The Statistical Package for Social Sciences (SPSS, version 18) was used for data entry and analysis. All the values were expressed as Mean  $\pm$ SD. The statistical analysis was done using student 't' test for comparison between two groups and a p-value of <0.05 was considered statistically significant.

## RESULTS

Table 1 displays the anthropometric parameters of case and control groups: The mean age of case group was 30.3 $\pm$ 4.5 years and that of control group was 31.1 $\pm$ 6.2. however, the difference in age between the two groups was not significant.

The mean BMI of the infertility group was in the overweight range (as per standard criteria), and there was a significant difference was observed in compare to healthy group. (table-1). The waist circumference and hip circumference was higher in women with infertility but the difference was not found to be significant. (table-1)

**Table 1** anthropometric parameters of case and control groups.

Parameters	Control(n=40)	Case(n=40)	P value
Age	31.1 $\pm$ 6.2	31.3 $\pm$ 4.5	>0.5
Weight( in Kg)	55.7 $\pm$ 7.5	59.12 $\pm$ 7.85	<0.5
BMI	24.9 $\pm$ 3.3	27.5 $\pm$ 3.19	<0.5
Waist/hip ratio	.8 $\pm$ .1	.9 $\pm$ .08	>0.5

**Table 2** Hormone levels in control and case group

Parameters	Control(n=40)	Case(n=40)	P value
T3	2.99 $\pm$ 9.97	1.31 $\pm$ 0.43	<0.5*
T4	8.43 $\pm$ 3.19	9.97 $\pm$ 2.37	<0.5*
TSH	5.19 $\pm$ 4.99	6.27 $\pm$ 5.93	<0.5*
LH	5.88 $\pm$ 1.49	7.62 $\pm$ 5.84	<0.5*
FSH	6.05 $\pm$ 1.11	6.85 $\pm$ 3.08	<0.5*
PROLACTIN	12.68 $\pm$ 9.46	17.37 $\pm$ 5.87	<0.5*

Table 2 depicts that detailed hormone levels in control and infertile group.

The mean serum levels of T3, T4 and TSH in infertile women was found to be lower (1.31 $\pm$ 0.43, 9.97 $\pm$ 2.37 and 6.27 $\pm$ 5.93) in compare to fertile women (2.99 $\pm$ 9.97, 8.43 $\pm$ 3.19 and 5.19 $\pm$ 4.99) and there was a statistical significance found between two study group (p<0.5)

We found that mean serum level of FSH 6.85 $\pm$ 3.08 mIU/ml in infertile women was higher than mean serum levels of FSH of 6.05 $\pm$ 1.11mIU/ml in fertile women that were statistically significant (p<0.5).

The mean serum level of LH was 7.62 $\pm$ 5.84 mIU/ml in infertile women was significantly higher than mean serum level of LH of 5.88 $\pm$ 1.49 mIU/ml in fertile women which were statistically significant (p<0.5).

The mean serum level of Prolactin was 17.37 $\pm$ 5.87 ng/ml in infertile women was higher than the mean serum level of Prolactin of 12.68 $\pm$ 9.46 ng/ml in fertile women which was highly significant (p<0.5). There was statistically significant difference found between levels of serum Thyroid hormones, FSH, LH and Prolactin in infertile and fertile women as shown in Table 2.

## DISCUSSION

According to WHO 8-12% of couples around the world experience problems in conception (8). Infertility is a global public health concern this is partly due to its complexity in aetiology as well as difficulty in preventing, diagnosing and treating it. Many hormones play a key role in the problem of subfertility either by endocrine or paracrine manner.

Thyroid dysfunction is a common cause of infertility. Hypothyroidism is associated with increased production of TRH, which stimulates pituitary to secrete TSH and PRL (9). Our study results showed associations with the abnormality TSH hormone levels and the fertility status. These results are very much in accordance to the results that were published earlier (10). The mean serum levels of T3 and T4 of the infertile women were significantly lower than those of the controls (p<0.05). Similar findings were reported by Poppe and Velkeniers (11)

In our present study we found, mean serum increased levels of mean serum prolactin level in infertile women. This result agrees with earlier studies. (12,13) Factors that increases it are multiple and interlacing like: sleep disturbances, surgery and hyperthyroidism (14)

FSH and LH are the key hormones in ovarian function. The high level of FSH is found in our results agrees with other studies (15), FSH level irregularities occur in young female at puberty and increases at premenopausal women due a decrease in ovarian reserve; (15) other causes of its increment are disorders like thyroid and adrenal disorders, chromosomal defects, irregular usage of oral contraceptive pills, pelvic surgery, abortion, pelvic inflammatory disease, chemotherapy and radiotherapy. (16)

## CONCLUSION

Different hormones such as FSH, LH, Prolactin, TSH, T4, T3, and Anthropometric factors such as BMI and weight play a role in pathogenesis and different mechanisms of infertility

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