The effect of pituitary hormones levels and relationship to female infertility in Baghdad province

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Abstract. This study carried out to investigate the relationship between prolactin, LH, FSH, TSH hormones and female infertility. The results demonstrated high significant of prolactin (P<0.01) between infertile women as contrasted with an intact group. The outcomes additionally indicated a significant difference at (P<0.01) of TSH of infertile women as contrasted and unblemished and demonstrated a significant difference at (P<0.05) of infertile women as contrasted and with intact. There were no significant differences of (FSH) level between infertile women and intact. The investigation shows the part of prolactin hormone was the most impact of the female infertility.

Keywords: Female infertility, Prolactin, LH, FSH, TSH hormones.

1. Introduction

1,3-Oxazole Infertility is one of the most significant problems in gynaecology and is defined as being able to achieve pregnancy after one year of unprotected intercourse [1]. Infertility is divided into main and secondary classifications based on the existence or lack of a prior pregnancy [2]. The three main variables that affect the spontaneous likelihood of conception are the time of the female partner's unwanted non-conception era and the disease-related infertility. Infertility associated with the disease may affect both sexes or may be specific to one sex. The factors that affect both sexes Fertility involve hypogonadotrophic hypogonadism, hyperprolactinemia, ciliary function disorders, cystic fibrosis, infections, systemic diseases and lifestyle-related factors/illnesses. In females, premature ovarian failure, polycystic ovarian syndrome, endometriosis, uterine fibroids and endometrial polyps may play a parting infertility [3]. Hormonal disturbances were considered to be of excellent significance in the understanding of the causes and diagnosis of female infertility prolactin plays a significant role in the reproductive health of both women and men. Its main role to stimulate the production of milk in women after childbirth [4]. FSH in females may show a decrease in the manufacturing of excellent quality fertilization eggs and embryos, higher normal levels of LH in a female may imply that the ovaries are present or not functional [5]. A thyroid stimulating hormone (TSH) secreted by the pituitary gland anterior lobe. Among the multiple causes of infertility in women is hypothyroidism and hyperthyroidism [6]. Overlap of thyroid hormones with reproductive hormones Interferes with normal egg and ovary production functions. Excess secretion or absence of secretion of these hormones may cause reproductive hormone imbalance, leading to irregular menstrual cycles and low fertility and ovulation diseases [7]. The study aims to identify the association
between female infertility and hormonal imbalance FSH, LH, TSH and Prolactin and identified the most effective hormones among others. Female infertility affects millions of couples in the world each year. It is estimated that globally 60-80 million couples suffer from infertility every year [8]. Many infertility cases are attributable to other medical circumstances. These disorders may damage the fallopian tubes, interfere with ovulation, or cause ovulation-affected hormonal abnormalities [9].

2. Materials and Methods

Sample collection

The example grouping acted in Kamal Al-Samarrai hospital. The all out quantities of tests are (166) rehearsing individual incorporates (91) sample from women suffer from infertility from the hormonal case and (75) samples from apparently healthy control. They were from among the females attending the infertility clinic of Kamal Al-Samarrai hospital, Baghdad. They all have a medical history of inability to conceive after 1 year despite regular and unprotected sexual intercourse information regarding the medical history and physical examinations of the selected participants were also obtained those who had male factors as a cause of their infertility. Participants with regular menstrual cycles were instructed to come for sampling on the 2nd or 3rd day of their menstrual period (follicular phase). A 5ml syringe and needle were used to collect 3ml of whole blood specimen from the ante-cubit a vein into a plain specimen bottle after disinfection of the vein puncture site. The serum obtained by placing the blood samples in a clean dry glasses gel tube of dry glasses was allowed to coagulate at 37 ºC for 30 minutes before centrifugation. The tubes were centrifuged for 5 minutes at 6000 rpm, The serum was collected and kept in the freezer until the immunological test and hormonal assay were used. In all enrolled subjects, serum levels of prolactin, luteinizing hormone (LH), thyroid stimulating hormone (TSH), follicle stimulating hormone (FSH) were measured using a final fluorescent detector (ELFA) enzyme immunoassay competition system on mini kits from the enrolled subjects LIAISON® KIT, Company, Italian. Designed for immunoassay testing (Flash chemiluminescence technology (CLIA) with a paramagnetic micro- particle solid phase. The standard range for adult serum T3 was 0.4-4 mIU/L, serum Prolactin it was 1.3-25 ng/mL. S.LH concentration in the follicular stage varying from 1.5-8 mlU/L, and in the Mid stage 9.6-80 mlU/L, and in Menapo stage varying 8-33mlU/L. S. FSH concentration in the follicular stage varying from 3.9-12 mlU/L, and in Mid stage 6.3-24 mlU/L, and in Menapo stage varying 17-95 mlU/L. These values are in compliance with LIAISON, Italian's commercially accessible kits.

Results were analyzed statistically by the Statistical Analysis System- SAS [10] program which was used to detect the effect of different factors in study parameters. T-Test was used to significant compare between means. There is a correlation coefficient between different levels in patients in this study.

Probability value: “P” is level of significance of an occurrence of an event.
P > 0.05 Non significant
P < 0.05 Significant
P<0.01 NS: Non-Significant.

3. Results and discussion:

Table (1) shown the prolactin hormones analyzed as Patients with infertility 26.38 ± 1.71 and the healthy control 15.46 ± 0.76 with high significant (P<0.01) there are many studies agree with it Prolactin hormone are exceptionally normal in infertile women as compared with fertile women. The prevalence of hyperprolactinemia is high in this study [11]. The serum Prolactin levels were expanded in infertile women the primary capacity of Prolactin is the turn of events and guideline of lactation in females. The expanded degrees of prolactin brings about amenorrhea, surprising lactation, hypoestrogenism and absence of ovulation. The current investigation demonstrated that the hyperprolactinemia is the reason for infertility in women. Similarly, expanded degrees of Prolactin have additionally been reported by [12].
Table 1. Comparison between patients and control groups in level of Prolactin hormone.

| Group      | No  | Mean ± SE of Prolactin(ng/mL) |
|------------|-----|-------------------------------|
| Patients   | 91  | 26.38 ± 1.71                  |
| Control    | 75  | 15.46 ± 0.76                  |
| T-Test     | --- | 3.957**                       |
| P-value    | --- | 0.0001                        |

***(P<0.01)***

Table 2 shows that TSH hormones analyzed as Patients with infertility 2.901 ± 0.25 and the healthy control 1.974 ± 0.11 with significant (P<0.01),[13]. Thyroid hormones play by direct consequences for the ovaries and by implication of numerous cooperations with other sex hormones. Hypothyroidism and Hyperthyroidism were among various reasons for barrenness in ladies [14].

Table 2. Comparison between patients and control groups in level of TSH hormone.

| Group      | No  | Mean ± SE of TSH(mlU/L) |
|------------|-----|------------------------|
| Patients   | 91  | 2.901 ± 0.25           |
| Control    | 75  | 1.974 ± 0.11           |
| T-Test     | --- | 0.588**                |
| P-value    | --- | 0.0020                 |

***(P<0.01)***

Table (3) shows the LH hormones which analyzed for Patients with infertility 4.38 ± 0.39 and the healthy control 15.01 ± 8.38 with non-significant. The high hormone fixation might be an irregularity marker discharge cycle of LH hormone the higher hormone focus intended to higher occurrence pace of infertile women. Poly Cystic Ovarian Syndrome (PCOS) disease may cause elevated levels of LH hormone in infertile women where the results show up in various examinations that there was diminished and expanded discharges proportion of FSH hormone. The LH hormone in infertile women having PCOS may reach (2:1) which made the ovary incapable to deliver the hormones in the correctly manner [15, 16,17].

Table 3. Comparison between patients and control groups in level of LH hormone.

| Group      | No  | Mean ± SE of LH(mlU/L) |
|------------|-----|------------------------|
| Patients   | 91  | 4.38 ± 0.39            |
| Control    | 75  | 15.01 ± 8.38           |
| T-Test     | --- | 10.043*                |
| P-value    | --- | 0.0465                 |

***(P<0.01)***

Table (4) shows the FSH hormones which analyzed for patients with infertility 7.00 ± 1.01 and the healthy control 6.18 ± 0.26 with non-significant. This can also result from high prolactin levels; which tends to suppress the ovulatory cycle by inhibiting the secretion of FSH.[18]. The FSH hormone is one
of the most significant controlling hormones the development and improvement of eggs [17]. Pointed out that high LH hormone fixation demonstrates the event of brokenness in the pituitary organ. The continued rise of LH leads to a decrease in the hormone FSH and increase in the proportion of the LH/FSH ratio. Thus estrogen secretion will decrease Androgen secretion increases as male hormones, leading to the failure of the ovary to stimulate the growth and maturity of ovarian follicles The lack of formation of follicles mature and therefore rarely the occurrence of ovulation and non-adherence of the menstrual cycle, and delay pregnancy and childbearing [19]. The Iraqi environment suffered from the pollution that might increase infertility in Iraqi females because the hormonal system in females is more sensitive to environmental variations [20].

Table 4. Comparison between patients and control groups in level of FSH hormone.

| Group   | No | Mean+ SE of FSH (mlU/L) |
|---------|----|-------------------------|
| Patients| 91 | 7.00 ± 1.01             |
| Control | 75 | 6.18 ± 0.26             |
| T-Test  | ---| 2.245 NS                |
| P-value | ---| 0.473                   |

NS: Non-Significant.

Table (5) show the distribution of patients according the level of Hormones. The group of prolactin hormones is least than 1.3 have frequency 2 with percentage 2.20%, the normal 1.3-25 have frequency 42 and percentage 46.15%and more than 25 frequency 47 and high percentage 51.65%.and the P-value(0.0001 **). The group of LH hormones is least than 1.5 have frequency 14 and percentage 15.38%, normal 1.5-8 is has frequency 62 and percentage 68.13%, more than 8 frequency 15 and Less high percentage 16.48%. P-value(0.0001 **).The group of FSH hormones is least than 3.9 have frequency 37 and percentage40.66%, normal 3.9-12 is have frequency 43 and percentage47.25%, more than 12 frequency 11 and percentage 12.09%. P-value (0.0001 **).The group of TSH hormones is least than 0.4 have no frequency and percentage, normal 0.4-4is have frequency 91 and percentage100%more than 4 no frequency and percentage. P-value (0.0001 **). The study found that the correlation between female infertility and hormonal imbalance agreement with [21].

Table 5. The distribution of patients according the level of hormone.

| Hormones | Group                | Frequency (total 91) | Percentage (%) | P-value |
|----------|----------------------|----------------------|----------------|---------|
|          | Least than 3.9       | 37                   | 40.66          |         |
|          | Normal: 3.9-12       | 43                   | 47.25          | 0.0001 **|
|          | More than 12         | 11                   | 12.09          |         |
|          | Least than 1.5       | 14                   | 15.38          |         |
| FSH      | Normal: 1.5-8        | 62                   | 68.13          | 0.0001 **|
|          | More than 8          | 15                   | 16.48          |         |
| LH       | Least than 1.3       | 2                    | 2.20           |         |
|          | Normal: 1.3-25       | 42                   | 46.15          | 0.0001 **|
|          | More than 25         | 47                   | 51.65          |         |
|          | Least than 0.4       | 0                    | 0.00           |         |
| ProLactin| Normal: 0.4-4        | 91                   | 100            | 0.0001 **|
|          | More than 4          | 0                    | 0.00           |         |

** (P<0.01).
Table (6) shows the coefficient hormone the level of significant between the FSH and LH hormones is high significant at (P<0.01) which is agree with [21] and the level of significant between the FSH and prolactin has difference at (P<0.05). Also, shows that, there is no significant between FSH and TSH, LH and Prolactin, LH and TSH, Prolactin and TSH.

Table 6. Correlation coefficient between difference levels of hormones in patients.

| Parameters               | Correlation coefficient-r | Level of Sig. |
|--------------------------|----------------------------|---------------|
| FSH & LH                 | 0.49                       | **            |
| FSH & Prolactin          | -0.21                      | *             |
| FSH & TSH                | -0.07                      | NS            |
| LH & Prolactin           | -0.09                      | NS            |
| LH & TSH                 | -0.03                      | NS            |
| Prolactin & TSH          | -0.05                      | NS            |

* (P<0.05), ** (P<0.01), NS: Non-Significant

The investigation presumed that expanded hormonal degrees of Prolactin, LH and TSH were found in infertile women when contrasted with the control group. The study show One of the reasons for infertility among women might be a distinction in degrees of prolactin hormones, the prolactin hormone ascend in women with infertility causes a condition considered Hyperprolactinaemia a typical condition that causes low fertility in women and expansion in the creation of milk hormone as the elevated level of milk hormone prompts stop the ovulation cycle by restraining the emission of FSH.

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