Serum Follicle Stimulating Hormone Levels in Female Patients with Primary Infertility in Sokoto

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Abstract: **Hormonal imbalance is one of the factors which contribute to female infertility. This study was to determine the serum levels of follicle stimulating hormone in female patients with primary infertility in Sokoto. A total of two hundred (200) subjects attending the Gynaecologic clinic of Usmanu Danfodiyo University Teaching Hospital, Sokoto were enrolled for the study. One hundred women age 19-35 years were subjects for the study. Another one hundred (100) women age and sex-matched apparently fertile were controls for the study. A consecutive sample of 4ml of blood was collected from one hundred (100) female patients with primary infertility into a red cap plain container between day 2 to day 6 while that of controls was collected in mid-luteal phase (day 21). Microplate Immuno Enzymometric Assay (IEMA/ELISA) technique was used for the analysis of the hormone. The results were expressed as Mean ±SEM using Microsoft Excel Analyse-it 2013. Student's T-test was used to compare the differences between subjects and controls. FSH (U/l) value for subjects was 22.02±0.753 and control 8.362±0.4678 (p=0.0001) which showed a significant differences. The study revealed an increase in the value of follicle stimulating hormone of patients compare to their corresponding controls. This signifies that hormonal imbalance in women could be attributable to their primary infertility.**

Keywords: **Follicle stimulating hormone, Infertility, ELISA, Blood.**

1. INTRODUCTION

Infertility is a wide spread problem that has an emotional, psychological, social and economic impact on couple and society (Ricci, 2009). Partly due to its complexity and to difficulty preventing, diagnosing and treating it, infertility is a global public health concern. More than 80 million people about 8% to 12% of all couples world wide. Infertility is a medical diagnosis of the reproductive system, and is defined as the in ability of couple to achieve pregnancy after one year of frequent unprotected intercourse (Jarrow, 2003). Primary infertility applies to a man or woman who has never been able to conceive while secondary applies to inability to conceive pregnancy after he had previously conceived (Ricci, 2009). Women older than 35 years having difficulty in conceiving may receive a diagnosis of infertility before a full 12 months (Sloboda *et al.,* 2010). Fertility is important to all societies. The inability to have children has traditionally been a source of agony, anxiety and shame, flagging the worse consequences to couples that are infertile. In Africa, couples who are unable to rear as many children as they wish may feel anguish or emotional panic hence several report have focused on the causes, prevention and treatment of infertility in the continent (Brunham *et al.,* 1992). In the female, ovulations, depends on a number of factors, including fetal life and complex interaction among hormones secreted from the brain, the pituitary gland and after reproductive maturity. During the menstrual cycle, the concentrations of hormones including estrogen and progesterone change dramatically, resulting in implantation of fertilized eggs. If this orchestrated and tightly control sequence of events is interrupted, infertility or reduced fertility may result (Sperrof *et al.,* 1994).

Follicle- Stimulating Hormone (FSH) is a hormone found in human and other animals .It is synthesized and secreted by gonadotrophs of anterior pituitary gland (Pierce and parson, 1981). FSH and Luteinizing Hormone (LH) and Human Chorionic Gonadotropin (HCG). The alpha sub-units of the glycoprotein, LH, FSH, TSH, and HCG are virtually identical and consist of about 96 amino acid while beta sub-units vary (Abdallah and Thum, 2004). Both sub-units of 111 amino acid (FSHß) which confers its specific biologic action, and is responsible for interaction with follicle stimulating hormone receptor (Goldenberg *et al.,* 1973).

2.   EFFECTS IN FEMALES

FSH stimulates the growth and recruitment of immature ovarian follicles in the ovary. In early antral follicles, FSH is the major survival factor that rescues the small antral follicles (2-5 mm in diameter for humans) from apoptosis. In the luteal follicle phase transition period the serum levels of progesterone and estrogen decrease and no longer suppress the release of FSH, consequently FSH peaks at about day three. The cohort of small antral follicles is normally sufficiently in number to produce enough inhibin B to lower FSH serum levels. High levels of FSH occur during reproductive year, it is abnormal. Condition with high

FSH levels includes
Premature ovarian failure
Luteal phase defect
Gonadal Dysgenesis
Polycystic ovarian syndrome
Anovulation.

3.   MATERIALS AND METHODS

Two hundred (200) subjects were enrolled for the study. One hundred (100) female patients with primary infertility were used as subjects where as one hundred (100) apparently healthy fertile female were used as controls. Exactly 4ml of blood sample was collected between day 2 to day 6 and day 21 for primary infertile patients and controls respectively. They were women within the child bearing age range of 19-35 years with case of infertility attending Gynaecology clinic at Usmanu Danfodiyo University Teaching Hospital, Sokoto.

The follicle stimulating hormone assay was determined by Enzyme Immuno Assay (ELISA) method using Accumono bind kits produced in USA. The basic principle is sandwitch in which colour produces by the enzyme interaction is directly proportional to the concentration of follicle stimulating hormone. The biochemical data generated from the analysis were subjected to statistical analysis. Values obtained were expressed as Mean ±SEM while student's t –test was used to test for differences between treatment group using statistical package software Microsoft Excel Analyse-it 2013. Value of ($p<0.05$) was accepted as significant

4.   RESULTS

The result showed significant difference in the Mean ±SEM of FSH for control compared with FSH Mean ±SEM of primary infertile used as subject (p=0.0001). The values of ages and FSH values of controls and subjects were presented in table 1.

Table 1: Serum concentration of follicle stimulating hormone (FSH) in the female patients with primary infertility in comparison with those obtained in the control group (Results in Mean ±SEM).

SNO	Group	Number	Age (yeas)	Serum FSH (U/I)
1	Control	100	23.97 ±0.34	8.36 ±0.47
2	Patients	100	24.7 ±0.45	22.0 ±3.08

P-value: >0.05

5.   DISCUSSION

The result of this study revealed an increased in the value of follicle stimulating hormone of female patients with primary infertility compared with the corresponding controls. (See table 1). FSH levels are higher in resistance ovarian syndrome which occurs very rarely in younger menstruating infertile women. It is only distinguish from primary ovarian follicle by intermittent resolution of the ovaries and normalization of FSH levels (Balen and Michelmore, 2002). Follicle-stimulating hormone (FSH) determinations are performed on oligo menorrhoeic women. High levels of FSH are consistent with women who have premature ovarian failure, while basal FSH levels are associated with poor ovarian reserve. The elevated FSH levels would suggest a poor response to ovarian stimulation (Khaliwal *et al.,* 1991). Therefore, high levels of FSH in female patients with primary infertility indicated hormonal imbalance.

6. CONCLUSION

This research revealed elevated serum FSH levels in female patients with primary infertility. Therefore, it is of immense significant to always consider hormonal analysis as part of treatment and management of infertility of couples in this environment.

7. RECOMMENDATION

It is always important to consider hormonal analysis as part of routine investigation to be frequently used in the treatment and management of couples with the problem of infertility.

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