Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 6[6] May 2017: 68-72

Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.533
Universal Impact Factor 0.9804
NAAS Rating 4.95

ORIGINAL ARTICLE **OPEN ACCESS**

Prevalence of Hormonal Imbalance in Local Women in Ayub Teaching Hospital, Abbottabad

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ABSTRACT
Luteinizing hormone, Follicle-stimulating hormone and Prolactins are hormones which can regulate the fertility of women at different stages. These hormones are affected by certain factors such as body weight food and exercise. Abnormality in the secretion of these hormones leads to the disorder in ovulation and menstrual cycle and leads to the infertility of a woman. This study was carried out at Abbottabad, Ayub medical complex where 100 patients were tested for their serum hormones. VIDAS Instrument technique was followed for the test of hormonal values. Different kits were used for each of hormones. LH hormones were seen mostly abnormal in this study which is about 64% of women which were included in this study have abnormal values of LH than normal. FSH values were abnormal in about 46% of women while prolactins were normal in majority of women at Abbottabad region except 8% women whom showing the increased value of prolactin than normal. The total infertility rate in this study was about 39.30% while 61.70% were fertile.
Key Words: *VIDAS, LH Hormones, FSH Hormones, Prolactins, Ovulation, Follicular phase, Luteal phase.*

Received 10.03.2017 Revised 02.04.2017 Accepted 21.04. 2017

INTRODUCTION

Reproduction and reproductive cycle is regulated by the hormones which are known as Fertility hormones and these hormones are tested for different disorders such as persons having early or delayed puberty problems or infertility, also these hormones are tested for disorders which are non reproductive. Fertility hormones regulate the Female fertility which is a biological process. These hormones are controlled by brain. Brain gives signals to body to secrete the hormones and perform some functions. The body in turn also send message to the brain to regulate some events through these hormones. This secretion of hormones repeated after ever cycle in adult women [1].

The healthy reproductive cycle known as eumenorrhoea is a process which includes the interaction and coordination of different factors which includes neurotransmitter systems, anterior pituitary gland hormones, hypothalamic releasing factors, anterior pituitary gland hormones, various growth factors and gonadal sex steroid hormones. All these factors coordinated with each other in healthy person for normal reproductive cycle and secretion of hormones. Most important hormones for the female reproductive cycle and their normal menstrual cycle are ovarian hormones which includes estrogen and progesterone. Hypothalamus releases gonadotropin releasing hormone (GnRH) which gives signals to anterior pituitary gland and releases FSH (follicle-stimulating hormone) and LH (luteinizing hormone). After release of these hormones in the circulation, they stimulate the ovarian cycle and enhance the development of eggs in the ovaries [2].

Female reproductive cycle ranges from 26-35 days which have 2 phases which are follicular phase and luteal phase. In the follicular phase the concentration of FSH is very high and the ovaries increases the secretion of estrogen also while in the luteal phase the concentration of LH is very high as well as the corpus luteum secrets the estrogen and progesterone both in high concentration [3].

Female infertility are caused due to hormones and this hormonal disorders are caused due to the abnormal ovulation, pre-mature ovarian failure, polycystic ovarian syndrome, damage to the uterus or fallopian tube or some abnormality with cervix. Hormones are released from the endocrine system and the disorders in this system results due to the abnormal production of one or more hormones or May also caused due to the abnormality in the regulator system of hormones in normal circulation [1].

Body weight and body mass index (BMI) have also impact on the hormones involved in the female fertility. Infertility may associate with the body weight and have been already discussed in different studies. The impact of obesity is on menstrual cycles which results in irregular and abnormal menstrual cycle and also have affect on the treatment for infertility. It is recommended that in obese and infertile women, first treat the obesity and then to infertility to get more successful results during treatment of infertility [4].

On the basis of population Pakistan is on the sixth number in overall world having the population of about 170 million which also shows that the fertility rate is very high in Pakistan. Up to 1990 the fertility rate in Pakistan was very high but after 1990 the population is not increasing so much and the fertility rate become decreased but the fertility rate is still high which is estimated that the births per women in Pakistan is 3.2 [5]. Religious beliefs, low education and low awareness in peoples are the some factors which involves in the high fertility rate of Pakistan [6].

Infertility becomes the major problem in all over the world in recent years due to the emerging of problem of infertility in couples which also affect the couples socially and psychiatrically. Such infertile couples are very eager for their treatment. About 10– 15% of couples have the problem of infertility in all over the world i.e. ranges from 60 to 80 millions of couples worldwide [7] while the prevalence of infertility in Asian countries ranges from 8–12%. In Pakistan the problems associated with infertility and fertility hormones ranges for about 21.9% [8],[9].

Some drugs are helpful in the treatment of infertility and can increase the secretion of luteinizing hormone and follicle stimulating hormone or control the over secretion of prolactin which are some causes involved in the infertility [10].

This study is arranged to observe the prevalence of infertility problems in women of district Abbottabad region of Pakistan, KPK. As the use of fast foods in the people of Abbottabad region is more and also the lack of exercise of the women at this district is much low, which are some factors involved in the infertility. For such purpose the women at Abbottabad avub medical complex are tested for different hormones such as FSH, LH and Prolactin by using the VIDAS Instrument.

MATERIAL AND METHODS

This study included 100 unmarried women whom visited to Ayub Teaching Hospital Abbottabad were tested for fertility hormones such as FSH, LH and prolactin to determine the prevelance of infertility in women at district Abbottabad region. Women of different ages ranged from 20 to 40 years old visited to hospital at different time, their blood samples were taken by using sterile plastic syringes. The samples taken from these women were 5cc blood and were collected in sterile syringe from each woman. Samples were brought to lab for investigating the values of fertility hormones. Different kits were used for FSH, LH and prolactin. The fertility hormones were then analysed in automated chemical analyser which is VIDAS Instrument. First the blood samples were centrifuged at 3000 rpm for 5 minutes so that serum and plasma become separated. 200 ml serum were taken and used in kits for investigating the values of LH, FSH and prolactin at different time. This step is sandwich FLSA. Remaining serum was stored at 2 to 8 degrecentigrade for further use. After addition of serum to the kits then the kits were placed in VIDAS instrument which automatically analyze the values of hormones. The normal values of LH in healthy woman at different time of cycle are given in table1 while the normal values of FSH are given in table2. The normal value for prolactin in healthy woman ranges from 5 ng/ml to 35 ng/ml. According to these normal values the results were compiled.

The control and standard are also used for most accurate results and to prevent the errors. Also control is used for the accuracy of kits used for different hormones to check whether the kits are up to date or expired.

Table1. Normal parameter of LH in woman	
Ovulation (DO)	9.6 – 8.0 mlU/ml
Follicular phase First half (D-15 to D-9) Second half (D-8 to D-2) Luteal phase (D+3 to D+15)	 1.5 – 8.0 mlU/ml 2.0 – 8.0 mlU/ml 0.2 – 6.5 mlU/ml
Menopause	8.0 – 33.0 mlU/ml

Table2. Normal parameter of FSH in woman	
Ovulation (DO)	6.3 – 24.0 mlU/ml
Follicular phase First half (D-15 to D-9) Second half (D-8 to D-2) Luteal phase (D+3 to D+15)	 3.9 – 12.0 mlU/ml 2.9 – 9.0 mlU/ml 1.5 – 7.0 mlU/ml
Menopause	17.0 – 95.0 mlU/ml

RESULTS

These fertility hormones are mainly affected by diet and weight. Diet such as fast foods used mostly by a person or use of vegetables mostly in diet can also affect the normal values of fertility hormones. Water and milk have also some affect on the secretion of hormones. Hence taking care of normal diet can tolerate the disorders of hormone secretion. In this study about 100 patients visited to Ayub medical complex Abbottabad were tested for fertility hormones through VIDAS Instrument which gives the automatic values of hormones such as LH, FSH and Prolactin by using different kits for each of these hormones. The patients visited to Ayub medical complex Abbottabad, most of them have abnormal LH. Out of 100 patients 58 patients have increase value than normal while only 6 patients have decrease value than normal. The remaining 36 patients have normal LH. It means that 58 percent patients have increased LH, 6 percent have decreased while 36 percent patients have normal LH (Table3, Graph1).

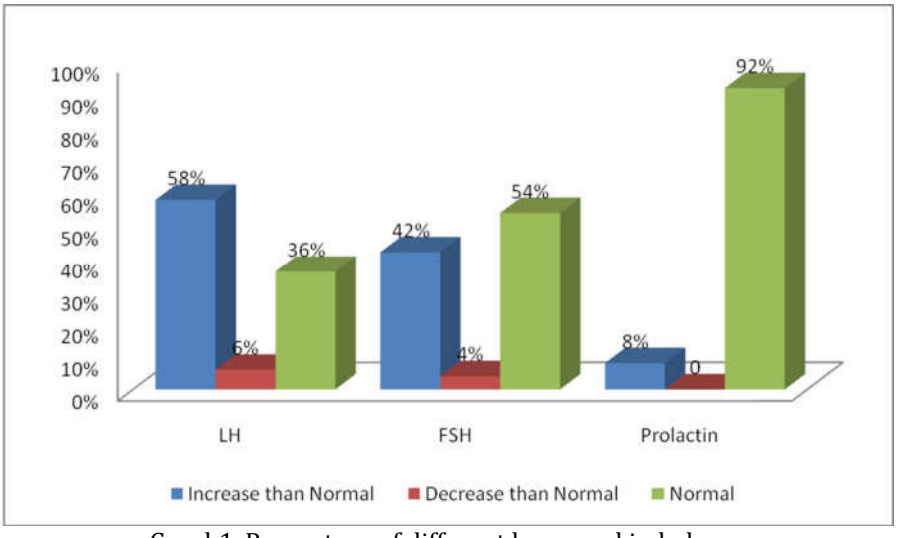
Most normal hormone is prolactin in these patients. About 92 percent patients in this study have normal secretion of prolactin while only 8 percent patients have increase value of prolactin than normal (Table3, Graph1)

42 patients have increase value than normal, 4 have decrease value of FSH than normal while remaining 54 patients have normal secretion of FSH hormones. This means that 46 percent of patients have abnormal values of FSH, 42 percent out of 46 percent have increase value of FSH than normal. The remaining 54 percent patients show the normal secretion of FSH (Table3, Graph1).

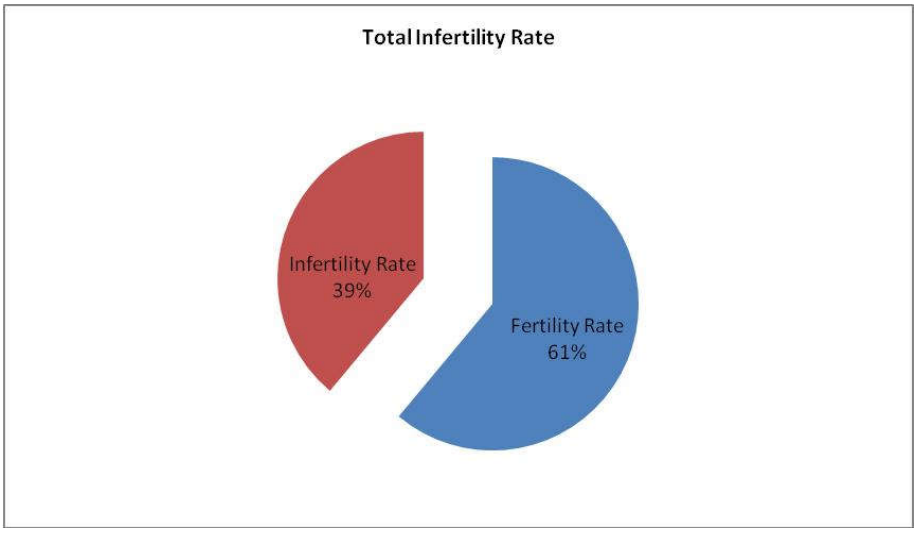
Hormones	Increased than Normal	Decrease than normal	Normal
LH	58%	6%	36%
Prolactin	8%	0%	92%
FSH	42%	4%	54%

Table3. Percentage of hormones in different patients

Abnormality of these fertility hormones can affect women in different aspects in which some of them are growth of hairs on face, change in voice, disturbance in menses period and growth of excessive hairs on body.



Graph1. Percentage of different hormonal imbalance



Graph2. Total Infertility Rate

DISCUSSION

In this study 100 unmarried female patient were included and were tested for fertility hormones at Abbottabad medical complex Pakistan. Through VIDAS Instrument there hormonal level which include FSH, LH and Prolactin were tested for investigating the prevalence of infertility in women at district Abbottabad region. Different populations at different region of world are studied for determination of prevalence and causes of infertility at different time which shows different rate of prevalence at different region of population in the world [11].

Pakistan is country which show high fertility rate and is on the 6 number of most populated countries in the world but Pakistani population have also the problems of infertility at high rate which is about 21.9%. Out of this 21.9%, 3.5% people show primary infertility while 18.4% population shows secondary infertility [12]. In this study 100 unmarried female patients were included which shows high infertility rate in them this shows that in our study primary infertility rate is about 39.3% (Graph2) which is very high at Abbottabad region as compared to the study of Tahir *et al.,* 2004. WHO reported in 2010 that in infertility cases male and female both are responsible equally for infertility [13]. But this study only include the unmarried female patients in which the infertility rate is high which means that at Abbottabad region females have more problem of infertility as compared to male patients.

FSH are the hormones having central role in the development and maturation of gonads at puberty and also helps in the gametes production at fertile phase [14]. In this study about 46% of patients have abnormal FSH level while 54% have normal secretion. As FSH have key role in the fertility of mammalian and its abnormality leads to infertility and abnormality in the pre-ovulatory phase (Table3, Graph1).

Lutenizing hormone helps to stimulate the gonads to secretion the sex steroids. In females, during the pre-ovulatory periods the LH stimulates the ovary to ovulate the mature follicles. Many authors explained that LH are responsible for the ovulation at the pre-estrous stage [15]. Abnormal LH secretion can affect the ovulation cycle in the female during their reproductive cycle. And in this stud most of the females have abnormal secretion of LH other than FSH and prolactin. About 64% of females in this study have abnormal LH. It means that females at Abbottabad region have problem in their LH secretion which is the main cause of infertility. The prolactin level observed in our study are mostly normal except 8% of female have increase level of prolactin and remaining 92% have normal prolactin level (Table3, Graph1).

Obesity and increased BMI affect the ovarian and leads to the infertility of women [16]. In this study the weight of every patient was noted and mostly the abnormal hormones are observed in obese women. So it is recommended that first treat the obesity and then to infertility to get most successful results during the treatment of infertility and also exercise is recommended to avoid the problem related to hormonal secretion in women which can cause infertility.

CONCLUSION

The results of this study concluded that women at Abbottabad region of Pakistan have high infertility rate due to abnormal secretion of LH and FSH. Most of women have normal secretion of prolactin. Exercise and weight loss is recommended because increase BMI can affect the secretion of fertility hormones in the women. LH and FSH secretions are mostly abnormal in the women of this region which may be due to the over use of fast foods than other foods.

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CITATION OF THIS ARTICLE

S Afridi, Aneeqa Iqbal, M Waqas, S Ahmed, A Aslam, Khyal Asghar, S Nazar, Mujaddad-ur-Rahman and M Ayub Jadoon. Prevalence of Hormonal Imbalance in Local Women in Ayub Teaching Hospital, Abbottabad. Bull. Env. Pharmacol. Life Sci., Vol 6[6] May 2017: 68-72