International Research Journal of Pharmacy and Medical Sciences
ISSN (Online): 2581-3277

Prolactin and Reproductive Hormone Status in Women with Oligomenorrhea and Infertility Problem

Suwal R[1], Maharjan BR[2], Nepal AK[1], Lamsal M[1], Baral N[1]
[1]B. P. Koirala Institute of Health Sciences, Dharan, Nepal
[2]Patan Academy of Health Sciences, Lagankhel, Lalitpur
Email address: drranjansuwal@gmail.com

Abstract—
Background: *Oligomenorrhea is a common problem of women these days. Oligomenorrhea during reproductive age group may lead to infertility which may bring stress, social stigma, dispute between husband and wife. The present study was designed to assess the Prolactin, Follicular Stimulating Hormone (FSH) and Luteinizing Hormone (LH) in oligomenorrheic patients in Eastern region of Nepal.*
Methods: *A total of 126 patients came to the immunoassay laboratory of Department of Biochemistry for the testing of Prolactin, LH and FSH from Department of the Obstetrics and Gynecology with complain of oligomenorrhea, primary infertility and secondary infertility. These patients were enrolled in the study with informed consent. Blood samples were collected in plain vial. Serum Prolactin, FSH and LH were measured by ELISA method (Eliscan, India).*
Results: *The mean age of patients was 24.33±5.91 which ranges from 15-45 years. Majority of them had complain of oligomenorrhea (76.2%) and other 23.8% of them had either primary or secondary infertility. In women with infertility, 53.33 % had elevated level of prolactin, 43.3% of women had decreased FSH and 46.6 % of women had decreased LH. In oligomenorrheic women, 41.66% women had elevated level of Prolactin, 51% women had decreased FSH and 56.2% women had decreased LH. There was no statistical difference between the median values of LH (p=0.961) and Prolactin (p=0.229) in oligomenorrhea and infertile group.*
Conclusion: *Our study showed that there was no remarkable difference of serum LH and Prolactin between women with oligomenorrhea and infertile problem.*

Keywords— *Oligomenorrhea, infertility, prolactin, LH and FSH.*

I. INTRODUCTION

Menstrual disorder such as oligomenorrhea has become a common problem among young women worldwide[1]. Oligomenorrhoea is defined as the pattern of menstruation cycle exceeding 35 days without affecting the duration and amount of flow. In developing countries, it is also a common problem among women[2]. Oligomenorrhea is commonly seen among young adolescent [2-4].

Infertility is a global health issue that approximately affects 8-10% of couple. World Fertility Survey and others estimated that the rate of infertility in Nepal is 6% [5, 6]. Primary infertility is defined as a couple who has never been able to conceive even after attempting a minimum of 1 year with unprotected intercourse. Secondary infertility is an inability to become pregnant or carry a baby to term after previously being able to give birth to a baby [7].Globally, rate of infertility is rising with increasing age and there is also an increasing trend in seeking medical advice at infertility center, yet a majority of infertile cases do not reach to infertility center[8]. Causes of infertility are many including problem in pituitary, fallopian tubes, uterus, cervix and ovaries[9, 10]. Late marriage, smoking, induced first pregnancy abortion, inactive life styles among women are also the causes of infertility[8].

Menstrual process is hormone regulated process mainly involving thyroid hormones, LH and FSH. FSH, LH and prolactin hormones are secreted from the anterior pituitary. Prolactin, FSH and LH acts together to stimulate follicular formation and ovulation which are important for fertilization. There is dysregulation of these hormones during infertility. The increased production of prolactin in case of prolactinoma cause infertility which in turn inhibits secretion of FSH and LH affecting the ovulation process [10, 11].

The changes in the prolactin and reproductive hormones are not well studied in oligomenorrhea in Nepal. The significance of this study in our context is that oligomenorrhea are often ignored until they have a problem of conception and by that time it is highly probable that women have already been through psychological and social problem. Moreover, in developing countries, women in many instances have faced a lot of problems including domestic violence, social stigma, isolation, economic insecurity and dispute between husband and wife [12]. We hypothesize that oligomenorrhea is also due the dysregulation of these hormones which would further lead to the infertility. This study aims to determine the hormonal pattern in oligomenorrheic women and to compare it with women having infertility problem.

II. MATERIALS AND METHODS

The study was carried out at B. P. Koirala Institute of Health Sciences in Dharan, Nepal. The data were collected from 126 patients that came to the immunoassay laboratory of Department of Biochemistry for the testing of Prolactin, LH and FSH from the Department of Obstetrics and Gynecology of which 96 patients have complain of irregular menstruation (Oligomenorrhea) and 30 women had complaint of either primary or secondary infertility. Husband semen analysis were found to be normal.

Suwal R, Maharjan BR, Nepal AK, Lamsal M, and Baral N, "Prolactin and Reproductive Hormone Status in Women with Oligomenorrhea and Infertility Problem," *International Research Journal of Pharmacy and Medical Sciences (IRJPMS)*, Volume 1, Issue 4, pp. 52-54, 2018.

After informed consent, 5 mL venous blood sample was collected in a plain vial for each patient at the time of presentation to Department of Biochemistry. After blood got clotted, it was centrifuged and then the serum was separated. In case of hemolysed sample, the second sample was taken during subsequent visit. Serum was stored at -20 0 C and assay were done within 2 days. Serum Prolactin, FSH and LH were measured by ELISA method (Eliscan, India).Reference range of serum Prolactin, serum FSH and Serum LH are 74-745 mIU/L, 3-12 mIU/mL and 0.5-10.5 mIU/mL respectively as provided by Eliscan, India. Statistical analysis was done in SPSS Ver 22. Kolmogorov-Smirnov test was used to test the normality of the data. The Mann-Whitney U test method was used for statistical analysis.

III. RESULTS

The mean age of patients was 24.33±5.91 and it ranged from 15-45 years. On the basis of age group, out of total 126 patients, 83 patients were between ages 15-25 years, 36 patients were between 26-35 years and 7 patients were above 35 years. Among 96 oligomenorrheic patients, 66 patients (68.8%) were between ages 15-25 years, 26 patients (27.0%) were between 26-35 years and 4 patients (4.1%) were above 35 years. Likewise, among 30 infertile patients 17 (56.7%) were between age 15-25 years, 10 patients (33.3%) were between 26-35 years and 3 patients (10.0%) were above 35 years [Table I]. Women with menstrual disorder were presented to hospital during young ages.

TABLE I. Prevalence of women with oligomenorrhea and infertility in different age groups.

Parameters	Oligomenorrhea N (%)	Infertility N (%)
Age (15-25)	66 (68.7%)	17 (56.6%)
Age (26-35)	26 (27.0%)	10 (33.3%)
Age >35	4 (4.1%)	3 (10.0%)

TABLE II. Level of Prolactin, FSH and LH in women with oligomenorrhea and infertility. Mann-Whitney U test was used to compare the levels between oligomenorreha and infertility and P-value indicates the level of significance.

Parameters	Oligomenorrhea Median (IQR)	Infertility Median (IQR)	P-Value
Prolactin (mIU/L)	697.94 (500.00;919.20)	783.51(515.578; 988.60)	0.229
FSH (mIU/mL)	8.49 (6.22; 15.05)	11.01 (8.1; 60.6)	0.043
LH (mIU/mL)	6.39 (3.62; 15.30)	6.34 (3.5,; 27.11)	0.665

Among total 126 patients, median and interquartile range of Prolactin, FSH and LH were 725.73 (502.00; 925.14) mIU/mL, 9.04 (6.61; 20.48)mIU/mL and 6.34 (3.62; 15.64) mIU/mL respectively. Similarly, among 96 patients of oligomenorrheic median and interquartile range of Prolactin, FSH and LH were 697.94 (500.00; 919.20) mIU/mL, 8.49 (6.22; 15.05) mIU/mL and 6.39 (3.62; 15.30) mIU/mL respectively. Likewise, in 30 patients of infertility median and interquartile range of Prolactin, FSH and LH were 783.51 (515.57; 988.60) mIU/mL, 11.01 (8.1; 60.6)mIU/mL and 6.34 (3.5; 27.11) mIU/mL respectively [Table II] There was no significant difference between both Prolactin and LH levels between oligomenorrheic (p=0.23) and infertile (p=0.66) women. But, there was a significantly lower level of FSH in women with oligomenorrhoea compared to infertility problem (p=0.43).

IV. DISCUSSION

This study showed increased level of prolactin in 53.3% of about women with infertility problem which was similar to the study done by Sarika et al where they found 54% women with elevated prolactin. But our result was higher compared to the study done by Goswami et al. (41%) [13], Idrisa et al. (31.7%) [14], by Mohan et al. (42.9%) [11]. An increase inprolactin level is also associated with pituitary tumor, intake of some drugs that inhibits gonadotropins hormones (FSH and LH) causing disturbances in ovulation leading to infertility [11]. Besides hormonal cause, infertility can be due to change in normal anatomical structures that may be congenital like primary ovarian failure, Turner's syndrome. In women with oligomenorrhoea, our study showed average prolactin level on higher spectrum of reference rangeand41.66% of women with oligomenorrhea had elevated prolactin level. Similarly, Goswami B et al. [13] had mentioned that prolactin level was increased in women having menstrual dysfunction mainly oligomenorrhoea.

In this study, LH and FSH were decreased in 46.6% and 43.3% of women with infertility problem respectively. Similarly, a study conducted by Mohan et al. [11], Olooto et al. [15], Isong et al. [12] showed a decrease in LH and FSH in 56.2% and 51.0% of women with oligomenorrheic respectively. Our finding is consistent with the role of increased Prolactin level in inhibiting pituitary gland and subsequently suppressing the release of FSH and LH effecting the ovulation and menstrual process [11, 16]. In contrast to our finding, Bheem Prasad et al and Ban Mousa Rashid et al studies showed increased LH and FSH level in infertile women [17, 18].

There was no significant difference in prolactin level (p=0.23) and LH level (p=0.665) between women with oligomenorrhea and infertility problem. The pattern of hormonal change in both oligomenorrhea is consistent with the established role of elevated prolactin level in decreasing FSH and LH in women with infertility problem. Interestingly, FSH (p=0.043) was reduced greater in women with oligomenorrhea compared to those with infertility problem. It suggests that oligomenorrhea is just a presenting symptom of infertility. Our findings of hormonal level in oligomenorrhea is also consistent with our hypothesis as we have observed similar hormonal pattern with the women with infertility problem. The screening of these hormone levels in oligomenorrheic women could useful to take necessary measures to prevent infertility problems in these women.

V. CONCLUSION

This study showed that the pattern of prolactin and LH in women with oligomenorrhea is similar to the women with infertility problem and if causes of oligomenorrhea is addressed early by appropriate medical intervention, vulnerable women can be protected from domestic violence, isolation and psychological stress.

Suwal R, Maharjan BR, Nepal AK, Lamsal M, and Baral N, "Prolactin and Reproductive Hormone Status in Women with Oligomenorrhea and Infertility Problem," *International Research Journal of Pharmacy and Medical Sciences (IRJPMS)*, Volume 1, Issue 4, pp. 52-54, 2018.

REFERENCES

[1] Rigon F, De Sanctis V, Bernasconi S, Bianchin L, Bona G, Bozzola M, et al. Menstrual pattern and menstrual disorders among adolescents: an update of the Italian data. Ital J Pediatr 2012;38:38.
[2] Nwankwo TO, Aniebue UU, Aniebue PN. Menstrual Disorders in Adolescent School Girls in Enugu, Nigeria. Journal of Pediatric and Adolescent Gynecology 2010;23(6):358-63.
[3] Singh KB. Menstrual disorders in college students. American Journal of Obstetrics and Gynecology 1981;140(3):299-302.
[4] Glueck CJ, Woo JG, Khoury PR, Morrison JA, Daniels SR, Wang P. Adolescent oligomenorrhea (age 14–19) tracks into the third decade of life (age 20–28) and predicts increased cardiovascular risk factors and metabolic syndrome. Metabolism 2015;64(4):539-53.
[5] Kumar D. Prevalence of female infertility and its socio-economic factors in tribal communities of Central India. Rural Remote Health 2007;7(2):456.
[6] Organization WH. Infertility: a tabulation of available data on prevalence of primary and secondary infertility. 1991.
[7] Unuane D, Tournaye H, Velkeniers B, Poppe K. Endocrine disorders & female infertility. Best Pract Res Clin Endocrinol Metab 2011;25(6):861-73.
[8] Subedi A. Infertility cases rising. *Republica.* Nepal; 2012 Feb.
[9] Zoe R. Causes of infertility in women at reproductive age. Health Science Journal 2009;3(2).
[10] Scott M, Ladenson J, Green E, Gast M. Hormonal evaluation of female infertility and reproductive disorders. Clinical chemistry 1989;35(4):620-9.
[11] K Mohan MS. Follicle Stimulating Hormone, Luteinizing Hormone and Prolactin Levels in Infertile Women in North Chennai, Tamilnadu. J Bio sci Res 2010;Vol. 1(1):6.
[12] Bassey IE, Udoh AE, Essien OE, Isong IK, Gali RM, Archibong EE. Thyroid hormones and prolactin levels in infertile women in southern Nigeria. J Clin Diagn Res 2015;9(3):Oc13-5.
[13] Binita G, Suprava P, Mainak C, Koner BC, Alpana S. Correlation of prolactin and thyroid hormone concentration with menstrual patterns in infertile women. J Reprod Infertil 2009;10(3):207-12.
[14] Idrisa A, Kawuwa MB, Habu SA, Adebayo A-EA. Prolactin levels among infertile women in Maiduguri, Nigeria. Tropical Journal of Obstetrics and Gynaecology 2003;20(2):97-100.
[15] Olooto WE, Adeleye O, Amballi AA, Mosuro AO. Pattern of reproductive hormones (follicle stimulating hormone, luteinizing hormone, estradiol, progesterone, and prolactin) levels in infertile women in Sagamu South Western Nigeria. Der Pharm Lett 2012;4(2):549-53.
[16] Mishra R, Baveja R, Gupta V. Prolactin level in infertility with menstrual irregularities. 2002.
[17] Prasad B, Parmar D, Sharma N. A study on serum FSH, LH and Prolactin Levels Among infertile women. International Journal of Medical Research & Health Sciences 2015;4(4):876-8.
[18] Rashid BM, Mahmoud TJ, Nore BF. Hormonal Study of Primary Infertile Women. Journal of Zankoy Sulaimani-Part A (JZS-A) 2013;15(2):137-42.

Suwal R, Maharjan BR, Nepal AK, Lamsal M, and Baral N, "Prolactin and Reproductive Hormone Status in Women with Oligomenorrhea and Infertility Problem," *International Research Journal of Pharmacy and Medical Sciences (IRJPMS)*, Volume 1, Issue 4, pp. 52-54, 2018.