PREVALENCE OF HYPERPROLACTINEMIA IN EUTHYROID INFERTILE FEMALES

Obstetrics & Gynecology

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ABSTRACT

Infertility is the inability of a couple to achieve pregnancy over a period of one year despite regular unprotected coitus. It can be due to various causes. This cross sectional study was done to find the prevalence of hyperprolactinemia in euthyroid infertile women. A total of 76 infertile women with normal thyroid function attending the outpatient department were included in this study. Maximum cases were seen in the 25-35 year age group with the mean age of 26.35 ± 3.11 years. The prevalence of hyperprolactinemia in euthyroid infertile women was 9.21%. The mean serum prolactin level in primary infertility women was 14.12 ± 5.54 ng/ml while that in secondary infertility was 18.31 ± 6.12 ng/ml. So, the estimation of serum prolactin levels in infertile patients with euthyroid status could be of great benefit in management of infertility.

KEYWORDS

Hyperprolactinemia, Infertility, Euthyroid Women.

INTRODUCTION

Infertility is the inability of a couple to achieve pregnancy over an average period of one year (in a woman under 35 years of age) or 6 months (in a woman above 35 years of age) despite adequate, regular, unprotected sexual intercourse¹. It is further classified as primary in which no previous pregnancies have occurred, and secondary in which a prior pregnancy, not necessarily a live birth has occurred. Infertility can be due to female factors (35%), male factors (30%), both (20%) and unexplained or idiopathic (15%)². Female factors can be ovulatory, tubal, uterine, hormonal, cervical and pelvic factors. Various hormones play an important role in conception, so estimation of these hormones (especially prolactin and thyroid stimulating hormone) are important for diagnosing the cause of infertility and its management³.

Hyperprolactinemia is one of the most common endocrine disorder of the hypothalamic-pituitary ovarian axis affecting the reproductive functions⁴. It is present in as high as 9 to 17% in women with reproductive disorders⁵. Hyperprolactinemia causes infertility in females by impairing pulsatile gonadotropin releasing hormone (GnRH) secretion and hence interfering with ovulation. Menstrual and ovulatory dysfunction like anovulation, amenorrhoea and galactorrhoea are associated with increase in prolactin level^{6,7}. High prolactin levels may also interfere with estrogen and progesterone production. Hyperprolactinemia can stop ovulation altogether⁸. Women with hyperprolactinemia are generally treated with dopamine receptor agonists to reduce serum prolactin levels and regularisation of menses^{9,10}. Thyroid hormone and prolactin regulate each other's functioning but it is seen in many studies that even in euthyroid females, hyperprolactinemia alone can lead to infertility. So this study was done to find the prevalence of hyperprolactinemia in euthyroid infertile females.

MATERIALS AND METHODS

The study was a cross sectional study conducted in the department of Obstetrics and Gynaecology, Nalanda Medical College and Hospital from April 2018 to November 2019. A total of 76 infertile women with normal thyroid function attending the outpatient department were included in this study.

Inclusion criteria: infertile women with duration of marriage at least one year or more with normal thyroid function.

Exclusion criteria

- male factor infertility in partner
- female infertility due to tubal factors
- any congenital anomaly of urogenital tract
- any obvious organic lesion
- any drug intake affecting prolactin level.

After proper written consent, 76 infertile women were enrolled. All recruited subjects underwent a detailed history and examination as per standard pre-structured protocol. They were screened for their thyroid status. Euthyroid participants fulfilling inclusion criteria and who did not have any exclusion criteria were recruited. Detailed history was taken and patient's age, duration of marriage, duration of infertility, history of any drug intake, partner history was noted. All recruited women were thoroughly examined with special attention to secondary sexual character, thyroid enlargement and presence of galactorrhoea. Serum prolactin was estimated in all recruited cases. Diurnal variation on serum prolactin level was minimized by taking early morning sample. Serum prolactin levels also changes with physical examination (nipple stimulation, intercourse, breast examination), so women were instructed for nil per-orally from the night before and avoid stimulation of breast, nipple and intercourse from day before and on the day on which sample was to be taken. Women with prolactin levels more than 25ng/ml were considered as hyperprolactinemic. The prevalence of hyperprolactinemia among euthyroid infertile women was calculated.

RESULTS

Out of 76 infertile women, 54(71.05%) had primary infertility and 22(28.95%) had secondary infertility. The mean age of total women was 26.35 ± 3.11 years. Maximum women were in the age group of 25-35 years.

Table 1: Distribution of women according to age

Age group	Primary infertility	Secondary infertility
	Number (percentage %)	Number (percentage %)
<25 years	16(21.05%)	0
25-35 years	30(39.47%)	13(17.10%)
>35 years	8(10.52%)	9(11.84%)

The mean age of primary infertile women was 25.43 ± 2.34 years and that of secondary infertility group was 28.16 ± 3.71 years.

Seven women had prolactin level more than 25ng/ml accounting to 9.21% of total whereas 69 women (90.78%) had normal prolactin level.

Table 2 : Distribution of cases according to prolactin level.

Prolactin level	number	Percentage (%)
<5 ng/ml	2	2.63%
5-25 ng/ml	6	88.16%
>25 ng/ml	7	9.21%

Hyperprolactinemia was seen in 4 primary infertile women and in 3 secondary infertile women accounting to 7.40% and 13.63% respectively. On the other hand 50 primary infertile women and 19

secondary infertile women had normal level of prolactin in their blood.

Table 3: Distribution according to hyperprolactinemia and type of infertility

Type of infertility	Hyperprolactinemia	Normoprolactinemia
	Number (percentage)	Number (percentage)
Primary	4 (7.40%)	50 (92.59%)
Secondary	3 (13.63%)	19 (86.36%)

The prevalence of hyperprolactinemia in euthyroid infertile women was 9.21%. Sixty nine women (90.78%) had normal levels of prolactin. The mean serum prolactin level in primary infertility women was 14.12 ± 5.54 ng/ml while that in secondary infertility was 18.31 ± 6.12 ng/ml.

DISCUSSION

Hyperprolactinemia adversely affects fertility. Menstrual and ovulatory dysfunction like anovulation, amenorrhoea and galactorrhoea are associated with increase in prolactin level^{6,7}. High prolactin levels may also interfere with estrogen and progesterone production. Hyperprolactinemia can stop ovulation altogether⁸. This study was done to find the prevalence of hyperprolactinemia in euthyroid infertile women. So, 76 infertile women attending outpatient department were recruited.

The mean age of total women was 26.35 ± 3.11 years in our study. The mean age of primary infertile women was 25.43 ± 2.34 years and that of secondary infertility group was 28.16 ± 3.71 years. In a similar study done by Agrawal M et al mean age of 130 cases of primary infertility was 27.16 ± 3.76 years and mean age of 70 cases of secondary infertility was 28.12 ± 3.71 years (13). Badesara S et al calculated the mean age of 26.38 ± 3.95 years in women with infertility¹¹.

The prevalence of hyperprolactinemia in euthyroid infertile women was 9.21%. Sixty nine women (90.78%) had normal levels of prolactin. In a study done by Basedara S et al on euthyroid infertile women, the prevalence of hyperprolactinemia was found to be 8.5% which is similar to our study¹¹.

In a study done on 200 infertile women prevalence of hyperprolactinemia was 11.5% which is similar to our study¹². Similarly, in a study done by Tasneem et al, the prevalence of hyperprolactinemia was 4.90% and it included both male and female infertile patients with 22.7% patients having hypothyroidism in hyperprolactinemia group¹³. Sharma et al in reported hyperprolactinemia in 32% infertile females, where majority were euthyroid although few patients had hypothyroidism but it included both fertile and infertile patients¹⁴. A study done by Keerthana SR et al on 200 infertile females, prolactin level was found to be normal in 69% of participants and hyperprolactinemia was noted in 31% of study participants. This difference in result from our study can be due to inclusion of women with thyroid abnormalities¹⁵.

In our study, hyperprolactinemia was seen in 7.40% primary infertile women and in 13.63% secondary infertile women. In a study conducted by Basedara S et al in hyperprolactinemia group, approximately half (53.85%) of the participants had primary infertility while in normoprolactinemia group, majority (85%) had primary infertility as compared to 15% who had secondary infertility. Seven out of 126 primary infertile women and 6 out of 27 secondary infertile women had hyperprolactinemia¹¹.

The mean serum prolactin level in primary infertility women was 14.12 ± 5.54 ng/ml while that in secondary infertility was 18.31 ± 6.12 ng/ml in our study. In a similar study, the mean serum prolactin level in primary infertility participants was 13.18 ± 8.485 ng/ml while that in secondary infertility was 17.21 ± 15.1 ng/ml¹¹. Another study done on 200 infertile women with hyperprolactinemia, reported maximum cases with serum prolactin values between 25-75 ng/ml. Only 1 case had serum prolactin value > 75 ng/ml¹².

CONCLUSION

Prolactin plays an important role in the reproduction. It affects ovulation and causes menstrual irregularities. Estimation of prolactin levels should be included in infertility workup of every patient. Mostly it is seen in correlation with thyroid function disorder but hyperprolactinemia can alone be a cause of infertility in euthyroid women. Appropriate treatment should be started at the earliest.

REFERENCES

- Nambiar V, Jagtap VS, Sarathi V, Lila AR, Kamalanathan S, Bandgar TR, et al. Prevalence and impact of thyroid disorders on maternal outcome in asian-indian pregnant women. *J Thyroid Res*. 2011; Article ID 429097:1-6.
- Hendershot GE, Mosher WD, Pratt WF. Infertility and age: An unresolved issue. *Fam Plann Perspect*. 1982;14:287.
- Osman AA. Management of infertility within primary health care program in Sudan. *Asian J Sci Res*. 2011;4(2):158-64.
- Prabhakar VK, Davis JR. Hyperprolactinemia. *Best Pract Res Clin Obstet Gynaecol*. 2008 Apr;22(2): 341-53.
- Biller BM, Luciano A, et al. Guidelines for the diagnosis and treatment of hyperprolactinemia. *J Rep Med*. 1999;44(suppl):12.
- Onal ED, Saglam F, Sacikara M, Ersoy R, Cakir B. Thyroid autoimmunity in patients with hyperprolactinemia: An observational study. *Arq Bras Endocrinol Metabol*. 2014;58:48-52.
- Wang AT, Mullan RJ, Lane MA, Hazem A, Prasad C, Gathaiya NW, et al. Treatment of hyperprolactinemia: A systematic review and metaanalysis. *Syst Rev*. 2012;1:33.
- Kaiser UB. Hyperprolactinemia and infertility: new insights. *J Clin Invest*. 2012;122(10):3467-8.
- Motazedian. Hyperprolactinemia and infertility. *Indian J Med Res*. 2010;670-4.
- Biller BM, Luciano A, Crosignani PG, Molitch M, Olive D, Rebar R, et al. Guidelines for the diagnosis and treatment of hyperprolactinemia. *J Reprod Med*. 1999;44:1075-84.
- Badesara S, Jakhar K. A crosssectional study to find the prevalence of hyperprolactinemia in infertile euthyroid patients in a hospital. *Int J Reprod Contracept Obstet Gynecol* 2020;9:4394-7.
- Agrawal M, Samal S, Hariharan C, Agrawal S. Prevalence of hyperprolactinemia in infertile cases and its correlation with TSH in a rural set up hospital. *Int J Reprod Contracept Obstet Gynecol* 2013;2:626-30.
- Tasneem A, Fatima I, Ali A, Mehmood N, Amin MK. The incidence of hyperprolactinaemia and associated hypothyroidism: local experience from Lahore. *Pak J Nucl Med*. 2011;1:49-55.
- Sharma P, Prasad S, Tangri N. Female infertility and its correlation with serum prolactin and TSH concentration- an unmatched case control study. *J Pharm Biomed Sci*. 2013;30(30):902-7.
- Keerthana SR, Hiremath PB. Analytical study of thyroid and prolactin hormone levels in infertile women with menstrual irregularities. *Int J Reprod Contracept Obstet Gynecol* 2020;9:1328-34.A