

PREVALENCE OF HYPERPROLACTINEMIA IN WOMEN WITH INFERTILITY

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Abstract

Background: Infertility in women is a common reproductive problems and hormonal cause like raised prolactin level can disturb normal ovulation and fertility potential.

Objective

To determine the prevalence of hyperprolactinemia in women with infertility.

Study Design

Cross sectional study.

Duration and Place of Study

This study was conducted from Dec 2024 to April 2025 in the Department of Obstetrics and Gynaecology, Combined Military Hospital Multan.

Methodology

A total of 163 women with infertility aged 18–45 years was included. Venous blood samples was taken and serum prolactin level was measured by enzyme immunoassay, and hyperprolactinemia was labelled when level was more than 35 nanogram per millilitre. Data was analysed using statistical package for social sciences. Mean and standard deviation was calculated for quantitative variables, while frequencies and percentages was used for qualitative variables. Stratification was done and post stratification chi square test was applied, with p value ≤ 0.05 taken as significant.

Results

Mean age was 30.39 ± 4.82 years and mean duration of marriage was 5.60 ± 3.36 years. Obesity was present in 87(53.4%) women. Primary infertility was seen in 119(73.0%) and secondary infertility in 44(27.0%). Hyperprolactinemia was found in 41(25.20%) women. It was more in duration of marriage >5 years 29(35.4%) versus ≤ 5 years 12(14.8%) with significant association ($p=0.002$).

Conclusion

Hyperprolactinemia is common in infertile women and longer duration of marriage shows significant association with raised prolactin levels.

INTRODUCTION

Infertility among women is a common problem in reproductive health that is generally characterized by the inability to conceive after twelve months of regular sexual intercourse without contraception.¹ It impacts many couples

worldwide and has implications medically, psychologically, and socially. Its causes may be diverse and complex, comprising issues like ovulatory problems, fallopian tube obstruction, uterus problems, and hormonal imbalance.² Among these causes, ovulation disorders are

considered one of the most common. Age plays a key role, as fertility levels tend to decrease with aging because of low ovarian reserve capacity.³

Hyperprolactinemia is a major endocrine condition seen among women who have difficulties in conceiving, marked by an increased level of prolactin in the blood stream.⁴ Prolactin, which is responsible for lactation, will affect the usual functioning of the hypothalamo-hypophyso-ovarian axis in women when it is raised in the absence of pregnancy.⁵ The disruption of the axis results in the inhibition of GnRH, thereby resulting in decreased levels of LH and FSH with subsequent failure of ovulation.⁶

The management of hyperprolactinemia in infertile patients mainly depends on the causative factor and the severity of the elevation of prolactin.⁷ The initial line of treatment for hyperprolactinemia is usually pharmacotherapy with drugs that include dopamine agonists like bromocriptine and cabergoline, since these drugs prevent the production of prolactin.⁸ Pharmacotherapy can prove to be successful in achieving ovulation in many patients suffering from hyperprolactinemia.⁹ In circumstances where the pituitary adenoma does not respond to treatment using dopamine agonists, surgery can be an option.¹⁰

This research is highly essential due to the following reasons. First, infertility is a prevalent issue and hyperprolactinemia is a manageable cause of infertility. Hyperprolactinemia is often overlooked as an underlying cause in infertile patients. This could be attributed to the lack of information on the true prevalence rate of hyperprolactinemia within the local population. Early diagnosis is highly crucial since it will allow for the initiation of simple medical intervention, thus avoiding unnecessary surgical procedures. The objective of this study is to determine the prevalence of hyperprolactinemia in women with infertility.

METHODOLOGY:

This cross sectional study was conducted at the Department of Obstetrics and Gynaecology of Combined Military Hospital. Approval was obtained from institutional ethical review committee before start of data collection and study was carried out according to ethical principles. Sample size was calculated as 163 patients by using WHO sample size calculator with one proportion formula, taking prevalence of hyperprolactinemia as 29.28%, 11 confidence level 95% and absolute precision 7%.

Inclusion criteria: Women aged 18–45 years diagnosed with infertility as per defined criteria was included.

Exclusion criteria: Patients having abnormal pelvic ultrasonographic findings including adnexal or uterine masses, history of thyroid surgery, use of antithyroid drugs or lithium, and those already received treatment for infertility was excluded. Infertility was taken as inability to conceive after 1 year of regular unprotected intercourse, and it was further considered as primary infertility when no previous conception occurred and secondary infertility when there was inability to conceive after previous successful conception. Obesity was assessed by body mass index calculated as weight in kilograms divided by height in meter square and BMI ≥ 27.5 kg/m² was taken as obese. The study participants were enrolled from the outpatient department after getting informed consent in writing. The demographic characteristics of the patients documented were age, obese or non-obese, duration of marriage, and whether the condition of infertility is primary or secondary. All the patients underwent history taking and physical examination. Venous blood samples were collected aseptically for measurement of serum prolactin concentration by enzyme immunoassay method. The definition of hyperprolactinemia was a serum prolactin level > 35 ng/mL by enzyme immunoassay. All data was entered and analysed using IBM SPSS Statistics. Quantitative

variables like age, duration of marriage and serum prolactin levels was presented as mean and standard deviation. Qualitative variables such as obesity, type of infertility and hyperprolactinemia was presented as frequencies and percentages. Stratification was done with respect to age groups, obesity, duration of marriage and type of infertility to see effect on distribution of hyperprolactinemia. Post stratification chi square test was applied and p value ≤ 0.05 was taken as statistically significant.

RESULTS:

The study included 163 women with infertility. The mean age of the participants were 30.39 ± 4.82 years, and the mean duration of marriage were 5.60 ± 3.36 years. More than half of the women were obese (53.4%, n=87), whilst 46.6% (n=76) were not obese. Regarding infertility type, majority of the women had primary infertility (73.0%, n=119), and the remaining 27.0% (n=44) had secondary infertility (Table-I).

The frequency of hyperprolactinemia amongst the infertile women were found to be 25.20% (n=41), whereas 74.80% (n=122) of the women did not had hyperprolactinemia (Table-II).

On stratified analysis, the association of hyperprolactinemia with various demographic factors were examined. Amongst women aged 30 years or below, hyperprolactinemia was present in 29.9% (n=26), whereas in women aged above 30 years, it was present in 19.7% (n=15), however this difference was not found to be statistically significant (p=0.136). With regards to obesity, hyperprolactinemia was observed in 28.7% (n=25) of obese women and in 21.1% (n=16) of non-obese women, though this association were also not reached statistical significance (p=0.259). Duration of marriage were found to be the only factor which were significantly associated with hyperprolactinemia (p=0.002). Women with marriage duration of more than 5 years had notably higher prevalence of hyperprolactinemia as compared to those with duration of 5 years or less (35.4%, n=29 vs 14.8%, n=12). Concerning infertility type, hyperprolactinemia was more frequent in women with primary infertility (28.6%, n=34) as compared to secondary infertility (15.9%, n=7), however this difference was not attained statistical significance (p=0.098) (Table-III).

Table-I: Patient Demographics

Demographics	Mean $\pm$ SD / n (%)
Age (years)	30.39 ± 4.82
Duration of Marriage (years)	5.60 ± 3.36
Obesity	
Yes n (%)	87 (53.4%)
No n (%)	76 (46.6%)
Infertility Type	
Primary n (%)	119 (73.0%)
Secondary n (%)	44 (27.0%)

Table-II: Frequency of Hyperprolactinemia in Women with Infertility

Hyperprolactinemia	Frequency	%age
Yes	41	25.20%
No	122	74.80%
Total	163	100%

Table-III: Association of Hyperprolactinemia with Demographic Factors

Demographic Factors	Subgroup	Hyperprolactinemia		p-value
		Yes n(%)	No n(%)	
Age (years)	≤30	26 (29.9%)	61 (70.1%)	0.136
	>30	15 (19.7%)	61 (80.3%)	
Obesity	Yes	25 (28.7%)	62 (71.3%)	0.259
	No	16 (21.1%)	60 (78.9%)	
Duration of Marriage (years)	≤5	12 (14.8%)	69 (85.2%)	0.002*
	>5	29 (35.4%)	53 (64.6%)	
Infertility Type	Primary	34 (28.6%)	85 (71.4%)	0.098
	Secondary	7 (15.9%)	37 (84.1%)	

*Chi-square Test

DISCUSSION

Hyperprolactinemia was found in 25.20% of the cases in this current study. This correlates well with existing evidence that increased prolactin production causes the disruption of pulsatile release of GnRH in the hypothalamus, which further inhibits FSH and LH causing anovulation and infertility. In light of the increased prevalence observed, hyperprolactinemia should definitely be considered as a risk factor for infertility. However, the most important outcome of this

study is the relationship between hyperprolactinemia and the length of marriage among patients. It was revealed that women who had more than five years of marriage demonstrated a significantly greater prevalence of hyperprolactinemia (35.4%) compared to those who have less than five years (14.8%), with a p-value of 0.002. Such an association might be related to psychological stress and anxiety experienced by women during such prolonged periods of time when trying to conceive.

Increased stress triggers the activity of the hypothalamus-pituitary-adrenal axis which leads to prolactin production.

The prevalence of hyperprolactinemia in the current study were found to be 25.20% (n=41), which were comparable to the findings of Nallusamy S et al. 12 who reported prevalence of 24.67% in infertile women, and Malik S et al. 11 who reported prevalence of 29.28% among subfertile females. Similarly, Agrawal M et al. 13 reported relatively lower prevalence of 11.5%, whilst Reyes-Rojas D et al. 14 reported even lower prevalence of 9.6% in Mexican infertile women. These differences in prevalence could be attributed to the variations in study population, geographical location, dietary habits and differences in diagnostic criteria used for defining hyperprolactinemia across different studies. On the other hand, relatively higher prevalence were reported by Chaudhry I et al. 15 (41%), Ahmad R et al. 16 (54%), Shabab W et al. 17 (39%) and Saba N et al. 18 (52%), which could be explained by the differences in sample characteristics, hospital settings and possible inclusion of women with known endocrine disorders such as PCOS and hypothyroidism in those studies.

Regarding infertility type, primary infertility were more common in the present study (73.0%, n=119) as compared to secondary infertility (27.0%, n=44), which were in agreement with Nallusamy S et al. 12 who reported 79.6% primary infertility, and Malik S et al. 11 who found 66.75% primary infertility cases. This higher proportion of primary infertility in most studies does suggests that hyperprolactinemia tends to affect women who has never conceived, possibly because chronic anovulation via prolactin-mediated GnRH suppression prevents the first conception altogether.

The significant association of hyperprolactinemia with longer duration of marriage (>5 years, 35.4%, n=29 vs ≤5 years, 14.8%, n=12; p=0.002) were a notable finding of this study. This could be explained by the fact that prolonged infertility

itself is a major psychosocial stressor, and chronic psychological stress does activates the hypothalamic-pituitary-adrenal axis, leading to increased prolactin secretion. Chaudhry I et al. 15 also observed that considerable proportion of their patients had infertility duration of more than 5 years, which were supportive of this finding, though direct statistical comparison were not made in that study.

However, there are a number of limitations associated with the current research that should be mentioned. Firstly, since the investigation was conducted at one institution, the results might not be generalizable to a wider community. Furthermore, the sample size was rather low (n = 163), and hence could not be representative of all infertile females. Moreover, as far as the cross-sectional design is concerned, it does not allow establishing any cause-and-effect linkages. In addition, prolactin concentrations were assessed once, but prolactin release is rather variable.

CONCLUSION:

According to this study, the condition known as hyperprolactinemia is one of the relatively frequent hormones-related disorders found among infertile women, where the prevalence of the condition can be identified. From all the demographic characteristics considered, only the period of marriage was seen as being significantly related to hyperprolactinemia.

DISCLAIMER: There is no any disclaimer to mention.

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CONFLICT OF INTEREST:

The author state that they have no any conflict of interest related to this study.

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