Original Article

High Prolactin Levels Prevalence Among Subfertile Females in South Punjab, Pakistan

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Abstract

Objective: To find out how common hyperprolactinemia is among female subfertiles who visit a tertiary care hospital's outpatient department (OPD) in South Punjab, Pakistan.

Methodology: This cross-sectional study was carried out at the Nishtar Hospital's gynaecological outpatient department (OPD) in Multan, from Jan 2022 to June 2022. 379 patients with primary or secondary subfertility who fit the criteria were taken from the gynaecological outpatient department of Nishtar Hospital in Multan. All of the chosen women gave their informed consent before having their serum prolactin levels checked. A PC was used to enter data using SPSS version 10 for Windows.

Results: 39.05% of the women were nulliparous and between the ages of 26 and 30. In 21.89% of the instances, a body mass index (BMI) greater than 30 was noted. The majority of patients (66.75%) had primary subfertility, whereas 33.24% of cases had secondary subfertility. In 63.06% of patients, the length of infertility was less than five years, whereas in 36.93% of instances, it was more than five years. Among women who were infertile, the prevalence of hyperprolactinemia was 29.28%.

Conclusion: Patients with primary infertility are more likely to have hyperprolactinemia than those who have already conceived because it suppresses endogenous gonadotrophins, resulting in anovulatory cycles.

Keywords: High prolactin levels, primary infertility, secondary subfertility, prolactinoma

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Introduction

When a couple is unable to conceive after engaging in regular unprotected intercourse for a period of one year, they are considered to meet the criteria for infertility.[1] This condition often causes psychological distress. Approximately 15% of all couples encounter difficulties in conception. In Pakistan, male infertility accounts for about 22% of all infertility cases.[2]

Malfunctioning of the hypothalamic-pituitary-ovarian axis (HPO) can lead to disturbances in endogenous hormone levels in women, directly or indirectly affecting ovulation, thus reducing the couple's ability to conceive naturally.[3]

Elevated serum prolactin levels result in hyperprolactinemia, which is one of the most commonly encountered hypothalamo-pituitary endocrine pathologies among females aged 15 to 45.[4] The most common cause of high prolactin levels is prolactinomas, benign tumors categorized as microadenomas when small and macroprolactinomas when larger. Prolactinomas tend to manifest earlier in women than in men, even when they are microadenomas. The normal serum prolactin level ranges from 2.5 to 27 nanograms per milliliter (ng/ml).[5] High prolactin levels are found in 40% to 42% of subfertile females.[6]

In females with hyperprolactinemia, the clinical presentation most frequently includes oligomenorrhea

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(41%), primary infertility (26.5%), and secondary infertility (9.5%).[6]

Although the underlying cause of hyperprolactinemia cannot be determined by a single test, the level of serum prolactin provides some indication. Levels above 250 ng/ml indicate a higher likelihood of prolactinoma, while levels below 100 ng/ml suggest a lower possibility.[7] Levels exceeding 500 ng/ml raise strong suspicion of a macroprolactinoma. Other causes may be related to medication or malfunctioning of the hypothalamic-pituitary-ovarian axis (HPO). When no cause is found, it is termed idiopathic.[8]

Hypothalamic amenorrhoea and subfertility are known to be caused by elevated prolactin levels, while the underlying pathophysiology is still unclear. High prolactin levels reduce the gonadotropin surge and prevent ovulation by blocking gonadotropin-releasing hormone (GnRH) neurons in the hypothalamus and suppressing pituitary release of the gonadotropins luteinizing hormone (LH) and follicle-stimulating hormone (FSH).[9]

It helps with future planning and strategy for management because this study clarifies the degree of the problem among our population. Ovulation may be aided by several medications since they reduce serum prolactin levels, such as dopamine agonists.

It is crucial to examine the levels of hyperprolactinemia in all patients who arrive to the Gynae OPD with complaints of secondary amenorrhoea and infertility, as it is a curable cause of subfertility. The aforementioned facts highlight the importance of this topic, which is why researchers choose to carry out this study at Nishtar Hospital Multan. This study will enable international comparisons in addition to adding to the national data.

Methodology

This cross-sectional study was carried out at the Nishtar Hospital's gynaecological outpatient department (OPD) in Multan from Jan 2022 to June 2022. Non probability consecutive sampling was used. The sample size of the study were 379. All sub fertile women b/w 21-42 years age with period of subfertility > 1 year. Patients with abnormal husband semen analysis and any other obvious cause of subfertility were excluded from the study. Acceptance was obtained from the ethics committee. A total of 379 patients who met the established criteria were enrolled from the Gynecological Outpatient Department of Nishtar Hospital, Multan.

A comprehensive history was gathered, focusing on menstrual cycle regularity, parity, prior diagnoses of tubal pathologies, or congenital urogenital anomalies. Information such as biodata, presenting complaints, the classification of primary or secondary subfertility, and other pertinent details were documented. Following informed consent, serum prolactin levels were assessed in all female participants. A standardized proforma was utilized to ensure the inclusion of all relevant information.

SPSS version 10 was used to enter the data. To analyse the data, descriptive statistics were applied. The mean and standard deviation were used to compute quantitative variables like age and length of marriage. For women who are infertile, hyperprolactinemia frequencies and percentages were computed. Tabular structure was used to control for effect modifiers such as age, obesity (BMI >30 kg/m^2), length of marriage, and length of secondary subfertility. The Chi-square test was applied, and $p < 0.05$ was considered significant.

Results

Ages 27 to 31 reported for 39.05 percent of the patient population. The second biggest number of patients were between the ages of 31 and 35, accounting for 30.87%. Patients between the ages of 20 and 25 made up 21.10% of the cases, whereas the age group of 36 to 40 years old had the fewest cases (8.97%). The majority (66.75%) of the 379 subfertile patients were nulliparous (P0). 22.95% of cases were P1, 9.49% were P2, and 0.79% had parity ≥P3. (Table I).

Table I: Distribution of Patient Population by Age Group and Parity. (n = 379)

Age (years)	N(%)
21-25	80(21.10)
26-30	148(39.05)
31-35	117(30.87)
36-40	34(8.97)
Parity	
Nullipara	253 (66.75)
P1	87 (22.95)
P2	36 (9.49)
≥P3	3 (0.79)

Of the 379 individuals who were infertile, 78.10% had a BMI of less than 30, whereas 21.89% had a BMI of more than 30 (Figure 1).

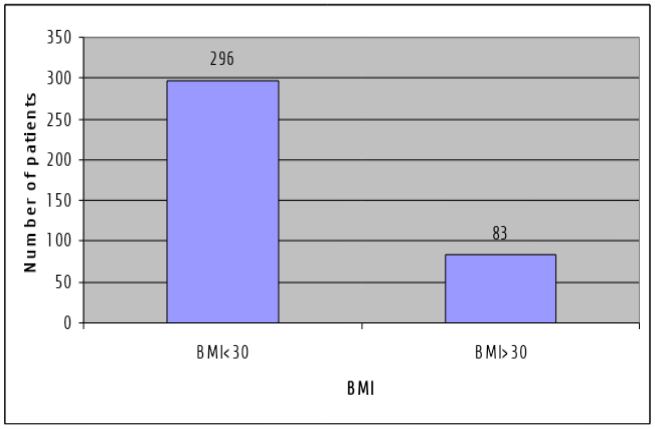

Figure No 1. Distribution of cases according to BMI (n =379)

In 63.06% of patients, the length of infertility was less than five years, and in 36.93% of instances, it was five years or more. The majority of patients (66.75%) had primary subfertility, whereas 33.24% of cases had secondary subfertility. 19.26% of patients experienced secondary subfertility for fewer than five years, while 13.98% of patients experienced secondary subfertility for five years or more (Table II).

Table No. II: Distribution of Infertility Length and Sub fertility Types Among Patients. (n =379)	
Duration of subfertility	N(%)
<5 years	239 (63.06)
≥5 years	140 (36.93)
Total	379 (99.99)
Type of subfertility	
Primary	253 (66.75)
Secondary	126 (33.24)
Total	379 (99.99)
Duration of secondary infertility	
<5 years	73 (19.26)
≥5 years	53 (13.98)
Total	126 (33.24)

Table III shows that 29.28% of sub fertile women had hyperprolactinemia overall. Overall frequency of hyperprolactinemia in sub fertile women was 29.28%.

Table III: Prevalence of Hyperprolactinemia. (n = 379)		
Hyperprolactinemia	Primary subfertility Number of patients	Secondary subfertility Number of patients
Yes	79 (20.84%)	34(8.97%)
No	174(45.91%)	92(24.27%)
Total	253(66.75%)	126 (33.24%)

Discussion

Comparable to an analysis, the current study's data show that 38% of patients have a low Body Mass Index (BMI) of less than 18, 32% have a BMI between 18 and 23, 13% have a BMI between 23.1 and 25, 17% have a BMI between 25.1 and 30, and just 1.2% have a BMI over 30.[10] In a similar vein, 65% of the 138 females had an increased BMI and 53% had benign pituitary adenoma. The included females were 36 years old on average.[4]

49–51% of obese individuals had macroprolactinemia. Table II shows that of the 379 patients, 63.06% had subfertility for fewer than five years, and 36.93% had it for five years or more (20 cases).

The results presented by this study are consistent with regional research carried out in this country. In that study, the duration of secondary subfertility varied from 2.5 to 2.8 years, while the duration of subfertility during original infertility was 2 years. According to a global survey, patients experience infertility for a duration of 2 to 4.8 years, with 31 to 33% of them going through the process for 7 to 11 years.[12]

The kind of subfertility in the population under study is displayed in Table II. Sixty-seven percent of the 379 patients had initial subfertility, and thirty-four percent of cases had secondary subfertility.

The present investigation's findings are consistent with those of Agrawal M.'s research. Thirty-seven individuals (35%) in the study were secondarily sub fertile, while 130 patients (65%) had primary subfertility.[13] In a related study, 12 patients (32%) had secondary infertility, and 22 patients (68%) were unable to conceive for the first time. Thirteen five patients (69%) and seventeen female patients (33%) in another worldwide study experienced primary subfertility.[12]

The frequency of hyperprolactinemia in women who are sub fertile is seen in Table III. In the current investigation, hyperprolactinemia was found in 29.28% of cases.

The current study provides validation for the findings of international research. In the study, there were 200 women, and 23 (12%) of them had high prolactin levels (>25 ng/ml). Blood prolactin levels were higher than 25 ng/ml in 16 of the 130 females with primary subfertility and seventy of the 70 women with secondary subfertility. Serum prolactin levels were >75 ng/ml in one patient with initial infertility and nil in the secondary infertility group.[13]

A local study conducted in Pakistan found that 69.51% of women with hyperprolactinemic conditions were infertile.[14] According to research conducted in India, 26–28% of infertile women also had elevated prolactin levels, supporting the findings of Morris and Sauer that 23–25% of them did.[14]

According to Tjeerdsma et al.panovulatory subfertility in women with hyperprolactinemia is caused by a reduction in LH and FSH.[15] In the meantime, Rolland's research revealed lower estradiol levels in individuals with hyperprolactinemia,[16] the underlying condition that led to aberrant follicle development and infertility. 25% of hyperprolactinemic females were observed to be subfertile by Morris and Sauer.[17]

In summary, females with primary infertility are more likely to have high prolactin levels and anovulatory cycles, which are highly correlated. The aforementioned research's analysis emphasises how important it is to measure serum prolactin levels in all females who complain of infertility when they visit the gynaecology outpatient department. Due to the fact that endogenous GnRH is suppressed by hyperprolactinemia, the LH surge which is necessary for ovulation is adversely affected. Treatment for hyperprolactinemia can help with subfertility. In July 2005, a study carried out in California discovered that subfertility affected more than 40% of patients with hyperprolactinemia.[18] Research on the prevalence of raised prolactin in infertile females was conducted in several parts of the world. The results showed that 58–62% [19] of the women in Iraq and 40–42% of the women in India, respectively, had high prolactin.[20]

Conclusion

According to the information above, anovulatory subfertility in females can be attributed in large part to hyperprolactinemia. Patients with original subfertility are more likely to have normalizing prolactin levels than those with secondary subfertility, and doing so can restore fertility.

The current study highlights the significance of measuring blood prolactin in all patients experiencing infertility, as the total prevalence of hyperprolactinemia among subfertile women was 29.28%. It is imperative that this test be performed as soon as possible and that it be included in first inquiries prior to evaluating more costly testing and therapy alternatives.

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