SERUM PROLACTIN ASSAY: AN IMPORTANT SCREENING METHOD IN PRIMARY AND SECONDARY INFERTILITY IN FEMALE

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ABSTRACT

BACKGROUND

Infertility represents a common condition nowadays with important medical, economic and psychological implications. Traditionally, measurement of Prolactin has been considered an important component of infertility workup in women.

AIMS

The study was designed to evaluate the serum prolactin assay in patients with primary and secondary infertility.

METHOD

In this retrospective case control study, we investigated one fifty (150) infertile women in the age range of 20-40 years attending Department of Obs. and Gynae. MLB Medical College, Jhansi, for infertility treatment. Fifty (50) fertile women with similar age range were selected as controls. The association between infertility and levels of serum Prolactin was reviewed.

RESULTS

Hyperprolactinemia was depicted in 24.66% infertile women. Prevalence of primary infertility was 68%, while that of secondary infertility cases was 32%. There was a correlation between Prolactin levels in infertile subjects ($p < 0.05$).

CONCLUSION

There was higher prevalence of hyperprolactinemia in infertile patients.

KEYWORDS

Prolactin (PRL), Hyperprolactinemia, Infertility.

HOW TO CITE THIS ARTICLE: Sharma S, Chaudhary V, Kharakwal S, et al. Serum prolactin assay: an important screening method in primary and secondary infertility in female. J. Evolution Med. Dent. Sci. 2016;5(16):766-768, DOI: 10.14260/jemds/2016/178

INTRODUCTION

Infertility is an important aspect of gynaecological practice. It is defined as the inability to conceive after one year of regular intercourse without contraception.⁽¹⁾ 30% of infertility is encountered as a result of hormonal disturbances.⁽²⁾ In these hormones, prolactin plays an important role. Prolactin is a hormone secreted by the pituitary gland. The pituitary gland is also known as the hypophysis and is located just below the hypothalamus of the brain. Measurement of prolactin has been considered an important component of infertility workup in women. Hyperprolactinemia also adversely affects the fertility potential by impairing pulsatile secretion of GnRH and hence interfering with ovulation.^[3] It may be seen in menstrual and ovulatory dysfunction like anovulation, amenorrhoea and galactorrhoea.^[4] Pituitary hormones such as TSH, prolactin or growth hormone may act synergistically with Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH) to enhance the entry of non-growing follicles into growth phase.

So, the aim of the study was to evaluate the serum prolactin assay in patients with primary and secondary infertility.

MATERIALS AND METHODS

This was a hospital based, retrospective case control study conducted in Outpatient Department in Obs and Gynae MLBMCH, Jhansi. The cases consisted of 150 female subjects who were suffering from infertility and were evaluated for serum prolactin assay. The inclusion criteria for the selection of cases were diagnosis of infertility (Both primary and secondary) and age between 20-40 years. The exclusion criteria that were adopted during case selection were male factor infertility and amongst female factors were tubal factor, any congenital anomaly of urogenital tract or any obvious organic lesion; 50 healthy, fertile females in similar age range were enrolled as controls. Prolactin levels of the infertile patients and controls were recorded. Prolactin levels were assayed by competitive enzyme immunoassay (ELISA) using commercially available kit. Results of prolactin were collected and recorded. The normal ranges of prolactin was 1.2-19.0ng/mL respectively. These values were used to confirm abnormal cases.

RESULTS

Data on 150 infertile and 50 fertile women from study population were taken for analysis. Table 2 shows majority of

Financial or Other, Competing Interest: None.

Submission 03-01-2016, Peer Review 07-02-2016,

Acceptance 12-02-2016, Published 24-02-2016.

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DOI: 10.14260/jemds/2016/178

cases (49.08%) of primary infertility were in 26-30 years of age group followed by 20-25 years age group and majority of cases (47.09%) of secondary infertility were in 26-30 years of age group followed by 27.08% in 31-35 years age group. Out of the total 150 infertile women, 68% were suffering from primary infertility while 32% were suffering from secondary infertility (Table 1). Table 3 shows most of the patients of primary infertility were having their married life 2-5 years followed by 6-10 years. Table 4 shows most of secondary infertility had period of last child birth 6-8 years followed by 3-5 years.

Table 5 shows level of prolactin in control group. Lower limit was 5.5ng/mL and upper limit was 22.0ng/mL, mean level was 14.62ng/mL.

On studying serum Prolactin levels of 150 subjects, 37% had higher Prolactin levels while 63% had normal levels. Of those who had hyperprolactinemia, 26 (70.3%) women had primary infertility and 11 (29.7%) had secondary infertility (Table 6). The test of proportion shows high significant difference ($p < 0.01$) between the two.

The mean prolactin levels in infertile patients were 21.52 ± 17.71 ng/mL against the controls who had mean Prolactin levels of 14.62ng/mL (normal=1.2-19ng/mL) and both groups are showing statistically significant difference to each other (p value = 0.03).

Incidence of galactorrhoea was 16.22 in hyperprolactinemic infertile women, which is statistically significant ($p < 0.01$) Table 7.

Cases	No. of Cases	Percentage
a) Primary infertility	102	68%
b) Secondary infertility	48	32%
Controls	50	-
Total	200	100%

Table 1

Table 1 shows out of the total 150 infertile women 68% were suffering from primary infertility, while 32% were suffering from secondary infertility.

Sl. No.	Age Group	Secondary Infertility Number	Secondary Infertility %	Primary Infertility Number	Primary Infertility %
1	20-25	10	20.80	42	41.17
2	26-30	23	47.90	50	49.08
3	31-35	13	27.08	10	9.80
4	36-40	2	4.22	0	-
Total		48	100	102	100

Table 2

No. of cases with hyperprolactinemia	Cases with galactorrhoea no.	Cases with galactorrhoea %	Cases without galactorrhoea no.	Cases without galactorrhoea %
37	6	16.22	31	83.78
Mean serum prolactin level ng/mL	132.96		83.6	

Table 7

Table No. 7 shows the mean prolactin levels in infertile patients were 21.52 ± 17.71 ng/mL against the controls who had mean Prolactin levels of 14.62ng/mL (normal = 1.2-19ng/mL) and both groups are showing statistically significant difference to each other (p value = 0.03). Incidence of galactorrhoea was 16.22 in hyperprolactinemic infertile women, which is statistically significant ($p < 0.01$) Table 7.

Table 2 shows majority of cases (49.08% of primary infertility were in 26-30 years of age group followed by 20-25 years age group and majority of cases (47.09% of secondary infertility were in 26-30 years of age group followed by 27.08% in 31-35 years age group.

Years	2-5	6-10	11-15
No. of patients	80	17	5

Table 3

Table 3 shows correlation of years of married life in primary infertility. Most of the patients of primary infertility were having their married life 2-5 years followed by 6-10 years.

No. of patients	10	30	8
Period of last child birth	3-5	6-8	9-11

Table 4

Table 4 shows correlation of secondary infertility and last child birth. Most of secondary infertility had period of last child birth 6-8 years followed by 3-5 years.

No. of Controls	Range of prolactin in ng/mL	Mean+-s.d.
50	5.5-22.0	14.62+-4.31

Table 5

Table 5 shows level of prolactin in control group. Lower limit was 5.5ng/mL and upper limit was 22.0ng/mL, mean level was 14.62ng/mL.

Infertility Cases	No. of cases with hyperprolactinaemia	% of cases with hyperprolactinaemia
Primary infertility	26	70.3
Secondary infertility	11	29.7
Total	37	100.0

Table 6

Table No. 6 shows serum Prolactin levels of 150 subjects, 37% had higher Prolactin levels while 63% had normal levels. Of those who had hyperprolactinemia, 26 (70.3%) women had primary infertility and 11 (29.7%) had secondary infertility. The test of proportion shows high significant difference ($p < 0.01$) between the two.

DISCUSSION

Hyperprolactinemia is a common problem encountered in reproductive disorders.⁵ A 25% incidence has been reported.⁵ It is associated with oligomenorrhea, amenorrhea, anovulation, luteal phase defect and galactorrhoea.⁶

In our study, there were 68% women with primary infertility and 32% with secondary infertility.

Madhuprita et al. study reported 65% incidence in primary infertility and 35% in secondary infertility. Findings of our study is approximately same as Madhuprita et al. study.⁶

The incidence of galactorrhea in hyperprolactinemic women was 16.22%. Mishra et al.¹ have reported an incidence of 20% in infertility which is approximately same as ours. The incidence of hyperprolactinemia in our study is 24.6%. Mishra et al.⁷ have reported an incidence of 20% in infertility, which is approximately same as ours. It was 11.5% in Madhuprita et al. study.⁸

The mean prolactin level in hyperprolactinemic women in our study is 72.7ng/mL, whereas Mishra et al. found it to be 128.28±12.74ng/mL.

So prolactin estimation is recommended in all female patients presenting with complaints of primary and secondary infertility as treatment is possible. Dopamine agonists are the first choice treatment for both idiopathic hyperprolactinemia and for patients carrying prolactinomas. Surgery is done resistant cases.⁹

CONCLUSION

High serum prolactin levels are associated with menstrual disorders like amenorrhea, oligomenorrhea; ovulatory disorders like anovulation; luteal phase defect and galactorrhea. There is high prevalence of hyperprolactinemia in female patients with infertility and subfertility. So all the cases of infertility should be subjected for serum prolactin estimation. Prolactin estimation should be done at early stages of infertility checkup rather than going for more costly tests or invasive procedures. Dopamine agonists like bromocriptine, cabergoline and quinagolide administration restores normal ovarian function and is the first line treatment for most patients wishing to conceive.

Dopamine agonists are the first choice treatment for both idiopathic hyperprolactinemia and for patients carrying prolactinomas. Surgery is done on resistant cases.⁹

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