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Research Article

Prevalence of hyperprolactinemia in infertile cases and its correlation with TSH in a rural set up hospital

Madhuprita Agrawal*, S. Samal, C. Hariharan, Sweta Agrawal

Department of Obstetrics and Gynaecology, Acharya Vinoba Bhave Rural Hospital, Wardha, Maharashtra, India

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***Correspondence:**
Dr. Madhuprita Agrawal,
E-mail: sweetagr@yahoo.co.in

ABSTRACT

Background: Hyperprolactinemia is a common endocrine disorder of hypothalamic-pituitary ovarian axis affecting the reproductive functions. Despite the significant role of hyperprolactinemia in infertility, serum prolactin estimation is still not universally done as a part of evaluation of infertility. This study intended to find out the incidence of hyperprolactinemia in infertility, highlight the importance of assessment of serum TSH level in hyperprolactinemia.
Methods: 200 cases of primary and secondary infertility were investigated for serum prolactin levels at Acharya Vinoba Bhave Rural Hospital, Wardha from 2011-2013.
Results: There were 130 (65%) cases of primary infertility as against 70 (35%) cases of secondary infertility. A maximum of 106 (53%) cases were in the age group of 26 - 30 years, with the mean age as 27.50±3.76years. There were 11.5% cases of hyperprolactinemia out of 200 cases of infertility. 21.73% cases of hyperprolactinemia had hypothyroidism.
Conclusion: The high prevalence of hyperprolactinemia with infertility stresses the fact that all the cases of infertility should be subjected for serum prolactin estimation. Prolactin estimation should be done at early stages of infertility check up rather than straight away going for more costly tests or invasive procedures. There is high crude prevalence of hypothyroidism in hyperprolactinemia. All the cases of hyperprolactinemia should have TSH estimation.

Keywords: Hyperprolactinemia, Infertility, Prolactin, Hypothyroidism

INTRODUCTION

Pregnancy and motherhood are the developmental milestones that are highly emphasized by our culture. When attempts to have a child fails, it can be an emotionally devastating experience for a couple. Infertility is a global health issue, affecting 12 to 14% of the couples worldwide and remains stable in recent years.[1] The World Health Organization (WHO) estimates that 60 to 80 million couples worldwide currently suffer from infertility.[2]

According to the standard protocol, infertility evaluation usually identifies different causes, including male infertility (30%), female infertility (35%), the combination of both (20%), and finally unexplained or "idiopathic" infertility (15%).[3]

Hyperprolactinemia is one of the most common endocrine disorder of the hypothalamic-pituitary ovarian axis affecting the reproductive functions.[4] It is present in as high as 9 to 17% in women with reproductive disorders.[5]

There is also a higher crude prevalence of hypothyroidism in hyperprolactinemia in infertile women. TRH in addition to increasing TSH causes rise in prolactin level.[6] Increased level of serum prolactin has been reported in 30% of patients with primary hypothyroidism.[7] Hypothyroidism is commonly associated with hyperprolactinemia and such patients exhibit ovulatory failure. Hence, assessment of serum TSH and prolactin levels are mandatory in the work up of all infertile women.[8] Despite long history of hyperprolactinemia and its role in gonadal dysfunction, its still not been universally done as a part of routine

evaluation of infertility in rural areas. Therefore this study was intended to find out the prevalence of hyperprolactinemia in rural area and importance of assessment of serum TSH in hyperprolactinemia.

METHODS

It was a cross-sectional study carried out in the department of Obstetrics and Gynaecology at Acharya Vinoba Bhave Rural Hospital, Sawangi, Wardha, from August 2011 to July 2013. 200 cases of primary and secondary infertility were considered. Cases excluded were Infertility due to isolated male factor, females with any obvious organic lesion or any congenital anomaly of urogenital tract, females who are on drugs affecting prolactin levels.

Methodology

Firstly, preliminary details and complete history was recorded. Following this cases were thoroughly examined with special attention to secondary sexual character, thyroid enlargement and presence of galactorrhoea and then the cases were investigated. Serum prolactin was estimated in all the 200 cases of infertility. The cases with prolactin levels more than 25ng/ml were considered as hyperprolactinemic. Infertile cases with hyperprolactinemia were then subjected for TSH estimation and then values of TSH correlated with increased prolactin levels. The data obtained, was evaluated by Chi - square test. Probability (p) values <0.05, were regarded as statistically significant.

RESULTS

There were 130 (65%) cases of primary infertility as against 70 (35%) cases of secondary infertility (p<0.0001, Significant). A maximum of 106 (53%) cases were in the age group of 26-30 years, with the mean age as 27.50±3.76years. 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±3.71years (Table 1). There were 23 (11.5%) cases of hyperprolactinemia (>25 ng/ml) out of 200 cases of infertility (Table 2). The cases of infertility without hyperprolactinemia were 177(88.5%). Out of 130 cases of primary infertility 16 cases and out of 70 cases of secondary infertility 7 cases had serum prolactin more than 25 ng/ml (hyperprolactinemia). Serum prolactin was greater than 75 ng/ml only in 1 case of primary infertility and none in secondary infertility (Table 3).

Mean Prolactin in primary and secondary infertility z-value =1.07 and p-value = 0.286, Non-significant (p>0.05). The present study has shown that 65 (32.5%) cases sought medical advice within 5 years of infertility and remaining 135 (67.5%) cases sought medical advice after 5 years. In primary infertility group, 2 cases had duration of infertility greater than 15 years and in secondary infertility group 3 cases had greater than 15 years duration of infertility (Table 4).

Table 1: Distribution of cases according to age and type of infertility.

Age in years	Primary Infertility		Secondary Infertility		Total	
	No.	%	No.	%	No.	%
≤ 20	04	2	01	0.5	05	2.5
21-25	43	21.5	14	07	57	28.5
26-30	65	32.5	41	20.5	106	53
31-35	16	8	11	5.5	27	13.5
≥ 36	02	1	03	1.5	05	2.5
Total	130	65%	70	35%	200	100 %
Mean Age	27.16		28.12		27.50	
SD	3.76		3.71		3.76	

Table 2: Distribution of cases according to level of serum prolactin.

Levels of Serum Prolactin (ng/ml)	No. of cases	Percentage (%)
<5	04	02
5-25	173	86.5
>25	23	11.5
Total	200	100

Table 3: Levels of serum prolactin in cases with primary and secondary infertility.

Levels of serum PRL(ng/ml)	Primary infertility		Secondary infertility		Total	
	No.	%	No.	%	No.	%
<5	03	1.5	01	0.5	04	02
05-25	111	55.5	62	31	173	86.5
25-50	13	6.5	06	03	19	09.5
50 -75	02	01	01	0.5	03	01.5
>75	01	0.5	-	-	01	0.5
Total	130	65%	70	35%	200	100%
Mean	15.26		13.71		14.72	
SD	10.31		8.64		9.76	

Table 4: Distribution of cases according to duration of infertility.

Type of infertility	Duration in years				Total
	< 5	5-10	10-15	≥ 15	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Primary	51 (25.5)	52 (26)	25 (12.5)	02 (01)	130 (65)
Secondary	14 (07)	28 (14)	25 (12.5)	03 (1.5)	70 (35)
Total	65 (32.5)	80 (40)	50 (25)	05 (2.5)	200 (100)

There were 23 cases of hyperprolactinemia, of these the maximum of 19(82.6%) cases had duration of infertility of less than 10 years and only 4 cases had more than 10 years of infertility (Table 5). A majority of 19 (82.6%) hyperprolactinemic cases, had duration of infertility less than 10 years , of which a maximum of 15(65.21%) cases had serum prolactin value below 45ng/ml. Four cases of infertility with serum prolactin value >45 ng/ml had presented in 5-10 years of infertility (Table 6). 5 cases out of 23 hyperprolactinemic cases had hypothyroidism (Table 7).

Table 5: Duration and type of infertility in hyperprolactinemic group.

Type of infertility	Duration in years				Total
	< 5	5-10	10-15	≥ 15	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Primary	07 (30.43)	07 (30.43)	02 (8.69)	-	16 (69.56)
Secondary	01 (04.34)	04 (17.39)	02 (8.69)	-	07 (30.43)
Total	08 (34.78)	11 (47.82)	04 (17.39)	-	23 (100)

Table 6: Levels of serum prolactin and duration of infertility in hyperprolactinemic group

Levels of Serum PRL(ng/ml)	Duration in years				Total
	< 5	5-10	10-15	≥ 15	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
25-35	05 (21.73)	04 (17.39)	02 (08.69)	-	11 (47.82)
35-45	03 (13.04)	03 (13.04)	02 (08.69)	-	08 (34.78)
> 45	–	04 (17.39)	-	-	04 (17.39)
Total	08(34.78)	11(47.82)	04(17.39)	-	23(100)

Table 7: Correlation of hyperprolactinemia with TSH.

Total Hyperprolactinemic Cases(%)	No. of Cases With Hypothyroidism(%)
23(100)	5(21.73)

DISCUSSION

The present study showed that there were 130(65%) cases of primary infertility as against 70(35%) cases of secondary infertility. The prevalence of primary and secondary infertility was similar to the study of Ikechebelu JI et al(2003),[9] Avasthi Kumkum et al(2006)[10] and Sharma N et al (2012).[11] There is overall higher incidence of primary infertility in the population.[12] In the present study, analysis of age revealed that the maximum of 53% cases were in the age group of 26 to 30 years with mean age being 27.50±3.76. The mean age in primary infertility group was slightly lower 27.16 than the mean age in secondary infertility group 28.12 (Table 1). Similar to the findings of Singh et al(1981),[13] Ban Mousa Rashid et al (2013).[14] The higher incidence in the age group of 26-30 years could be related to the decline in the frequency of intercourse with age (Cheung AP et al 2011).[15]

In the present study, serum prolactin value was raised in 11.5% of the cases of infertility (Table 2) similar to Indu Verma et al (2012),[16] Thirunavakkarasu K et al (2013)[17] and less than that of Olooto et al (2012)[18] and Pratibha et al(1994).[19] As hyperprolactinemia may result from stress, N. Sonino et al (2004),[20] and the variable incidence may be due to the different stress levels of infertile women in different areas.

The present study has shown that amongst the hyperprolactinemic cases maximum cases had serum prolactin values between 25-75 ng/ml. Only 1 case had serum prolactin value more than 75 ng/ml (Table 3). Pituitary adenoma is usually seen in cases with serum prolactin value more than 100 ng/ml was reported by Verhelst J,(2003)[21] and Schlechte JA(2007).[22] Thus it is assumed that as the serum prolactin value in the study was less than 100 ng/ml, therefore the possibility of presence of adenoma was less. Mean serum prolactin in primary and secondary infertility group did not show any significant difference similar to finding of N. Sharma et al (2012).[11]

The present study has shown that 65 (32.5%) cases sought medical advice within 5 years of infertility and remaining 135 (67.5%) cases sought medical advice after 5 years (Table 4). Similarly analysis of duration of infertility in hyperprolactinemic cases has shown that the majority of 19(82.6%) cases had infertility of less than 10 years (Table 5). These infertility cases also had multiple associated problems like menstrual problems, galactorrhoea etc which affects the psychology of these patients and encourages them to take medical advice early. 4 cases in hyperprolactinemic group had more than

10 years of infertility. This delay in the treatment could be due to the fact that these cases had marginal elevation of the prolactin levels and were not having any additional symptoms except infertility. So they waited for a longer period.

A majority of 19 (82.6%) hyperprolactinemic cases, had duration of infertility less than 10 years, of which a maximum of 15(65.21%) cases had serum prolactin value below 45ng/ml. 4 cases with serum prolactin value >45 ng/ml mostly presented within 5-6 years. Only 1 case which had serum prolactin value more than 75 ng/ml had less than 5 years of duration of infertility (Table 6). It was observed that the higher the prolactin level, the lower the duration of infertility. Topalski-Fistes N et al (1999)[23] had commented that as the serum prolactin levels increase, the patient's symptoms may become progressively severe and multiple. As the serum prolactin values increase so do the patient's problems and cases with higher prolactin values come early to the hospital for the treatment.

Out of 23 cases of hyperprolactinemia 5 cases had hypothyroidism. There was no case with hyperthyroidism. There was a positive correlation between hyperprolactinemia and hypothyroidism as reported by Sharma N (2012),[11] Emokpae MA et al (2011).[24] The ratio of proportions between hypothyroidism and hyperprolactinaemia was 1:7. Similar finding was reported by Binita Goswami et al (2009)[8], Avasthi Kumkum et al (2006)[10] stated a positive correlation of 1:4 was found between hypothyroidism and hyperprolactinemia.

CONCLUSION

Problems in infertility are challenging and taxing to the clinician which can be solved just by tackling some simple endocrinological condition like hyperprolactinemia.

Hyperprolactinemia is a common finding in an infertile population. Presence of hyperprolactinemia should be looked for in patients presenting with decreased gonadal function .There is a positive correlation in between increased prolactin level and hypothyroidism. Based on these observations it can be said that all patients of infertility need serum prolactin estimation. And serum TSH should be estimated in cases with raised prolactin to find out cases primary hypothyroidism which is to be managed differently.

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