Section: Obstetrics and Gynaecology

Original Research Article

CORRELATION STUDY OF PROLACTIN LEVEL AND HYPOTHYROIDISM IN BOTH PRIMARY AND SECONDARY INFERTILITY IN FEMALES OF GUJARAT POPULATION

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Abstract

Background: One in every four couple is affected by infertility. Hormonies like prolactin and thyroid play a vital role in pregnancy and reproduction. Hence, evaluations of these hormones are mandatory to treat infertility in both primary and secondary infertility women. **Materials and Methods:** 35 primary and 35 secondary infertile women were studied. Complete hemogram, USG perineum and abdomen, and chest x-ray. The thyroid function test and prolactin hormone were studied using the Beckman-Coutter Access-II method in every patient. Age distribution and hormone levels in both the primary and secondary groups in fertility were compared. **Result:** Prolactin hormone levels 0-20 mg/ml in 15 (42.8%) in group A, 22 (62.8%) in group B, 21-100 mg/ml in 20 (34.2%) in group B >100 mg/ml was zero in group A, 1 (2.85%) in group B. In TSH study < 0.4 in 3 (8.5%) group A, 2 (5.71%) in group B, 0.4-4.7 in 24 (68.5%) group A, 29 (82.8%) group B, >4.7 in 8 (22.8%) group A, 4 (11.4%) group B. **Conclusion:** It is concluded that hyper prolectinemia with thyroid dysfunction, are main hindrance for pregnancy and reproduction in females.

INTRODUCTION

One in every couple (1:4) in developing countries has been found to be affected by infertility. The prevalence of primary infertility was higher among women aged 20–29 years who had primary infertility, and >30 years were defined as secondary infertility.[1] Hyper prolactnaemia adversely affects the fertility potential by impairing pulsatile secretion of GnRH and hence interfering with ovulation.[2] Serum prolaction levels are mandatory in all infertile women, especially those with oligomenorrhea and amenorrhea.[3] Thyroid hormones have profound effects on reproduction and pregnancy. There is a known association between hyperthyrodism and hypothyroidism and menstrual decline and decreased fecundity.[4] Hence, an attempt is made to find out the levels of both prolactin and thyroid hormones in infertile women and compare them in primary and secondary infertile women.

MATERIALS AND METHODS

70 (seventy) infertile women, regularly visiting the Obstetrics and Gynecology Department of Zydus Medical College and the hospital Dahod, Gujarat (389151), were studied.

Inclusive Criteria

Diagnosed infertility age between 20 to 40 years and duration of marriage greater than one year.

Exclusion Criteria

Male factor infertility, tubal factor, any congenital anomalies of the uro-genital, history of thyroid surgery, or being under medication for thyroid gland diseases.

Method: 35 infertile females are classified as having primary infertility (group A), and 35 secondary infertile females are classified as having group B. A complete haemogram, ESR, USG, perineum, abdomen, and chest x-ray were studied. A thyroid function test and scrum prolactin assay was carried out by using the Backman coulter in every patient in both groups.

The duration of the study was from August 2022 to May 2023.

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Statistical analysis: Various findings of both groups A and B were compared with percentages. The statistical analysis was carried out in SPSS software.

RESULTS

[Table 1] Study of duration of marriage in both groups of infirmity

- 1–5 years: 19 (54.2%) in group A, 10 (28.5%) in group B.
- 6–10 years: 10 (28.5%) in group A, 13 (37.50%) in group B
- >10 years: 6 (17.1%) in group A, 12 (54.2%) in group B infertile females

[Table 2] History of Menses in Both Groups

- Regular menses 12 (34.2%) in group A, 10 (28.5%) in group B
- Oligomenorrhea: 16 (45.7%) in group A, 15 (42.8%) in group B
- Amenorrhea: 4 (11.4%) in group A, 8 (22.8%) in group B
- Menorragea: 3 (8.5%) in group A, 2 (5.7%) in group B

[Table 3] Study of prolactin levels in infertility females of both groups

- 0-20 mg/dl: 15 (42.8%) in group A, 22 (62.8%) in group B,
- 21-100 mg/ml: 20 (57.1%) in group A, 12 (34.2%) in group B
- 100 mg/ml: zero in group A, 1 (2.85%) in group

[Table 4] Study of TSH levels in infertile females of both groups

- <0.4 TSH: 3 (8.5%) in group A, 2 (5.7%) in group B
- 0.4-4.7 TSH: 24 (68.5%) in group A, 29 (82.8%) in group B
- >4.7 TSH: 8 (22.8%) in group A, 4 (11.4%) in group B.

Table 1: Comparison duration of Marriage in both groups of infertility A and B

Sl No	Duration of year of marriage	Group A (35)		Group B (35)	
		No	%	No	%
1	1-5 years	19	54.2	10	28.5
2	6.10 years	10	28.5	13	37.1
3	More than 10 years	6	17.1	12	34.2

Table 2: Comparison of Menses in both group of infertility

Sl. No	History of Menses	Group A (35)		Group B (35)	
		No	%	No	%
1	Regular menses	12	34.2	10	28.5
2	Oligomenorrhea	16	45.7	15	42.8
3	Amenorrhea	4	11.4	8	22.8
4	Menorragea	3	8.5	2	5.7

Table 3: Study of prolactin level in infertility females

Sl. No	Level of prolactin	Primary Group (A) 35		Secondary Group (B) 35	
		Number	%	Number	%
1	0-20 mg/ml	12	42.8	22	62.8
2	21-100 mg/dl	20	57.1	12	34.2
3	>100mg/ml	0	0	1	2.85

Table 4: Study of TSH levels in infertile females

Sl No	TSH levels	Primary Group (A) 35		Secondary Group (B) 35	
		Number	%	Number	%
1	<0.4	3	8.5	2	5.71
2	0.4 – 4.7	24	68.5	29	82.8
3	>4.7	8	22.8	4	11.4

Normal TSH value – 0.5-4.7 MIM/ml.

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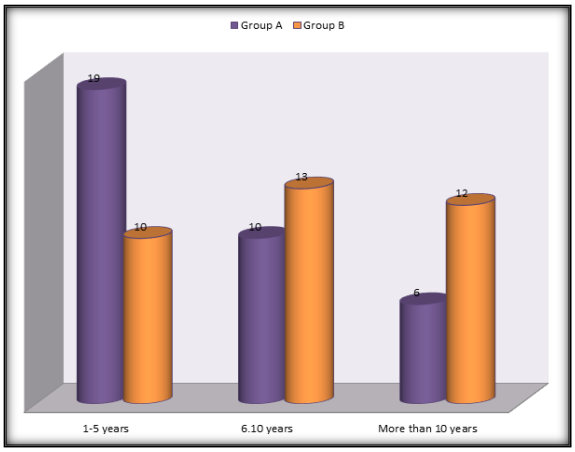

Figure 1: Comparison duration of Marriage in both groups of infertility A and B

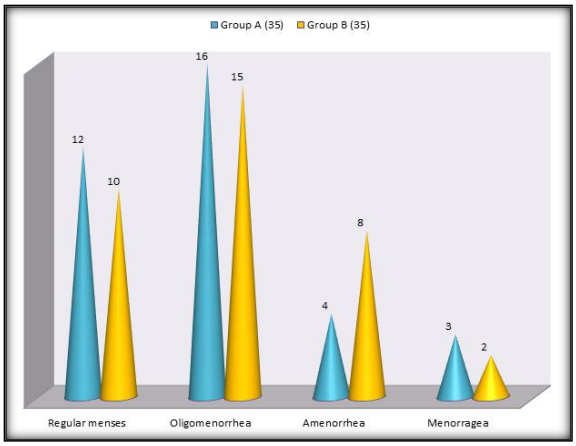

Figure 2: Comparison of Menses in both group of infertility

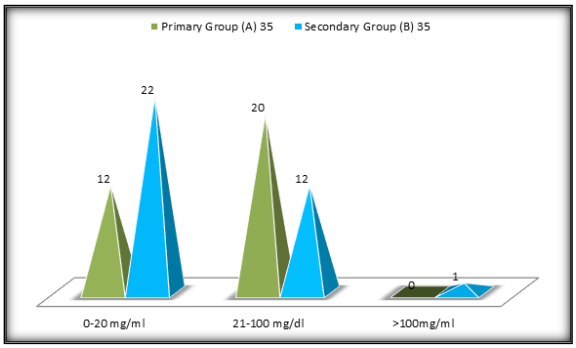

Figure 3: Study of prolactin level in infertility females

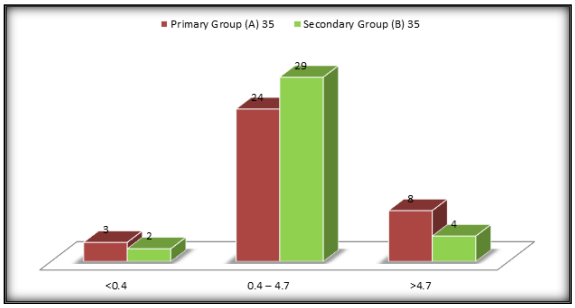

Figure 4: Study of TSH levels in infertile females

DISCUSSION

Present study of correlation of prolactin level and hypothyroidism in both primary and secondary infertility in females of Gujarat population. The duration of marriage 1–5 years was 6–10 years; > 10 years were classified in both groups [Table 1]. The history of menses, including regular menses, oligomenorrhea, menorragea, and amenorrhea, was also classified as both primary and secondary infelicity [Table 2]. In the study, the serum prolactin level in both primary and secondary infertility females was 0.20 mg/dl, with 15 (42.8%) in the primary and 22 (62.8%) in the secondary infertility groups. 21–100 mg/dl; 20 (57.1%) in primary and 12 (34.2%) in secondary infertility; females >100 mg/dl; 0 (zero) in primary and 1 (2.85%) in secondary infertility [Table 3]. In the study of TSH in primary and secondary infertility females, <0.4 µIU/ml 3 (80%) in primary and 2 (5.71%) infertility, 0.4-4.7 µIU/ml 24 (68.5%) in primary and 29 (82.8%) in secondary infertility females, > 4.7 µIU/ml 8 (22.8%) in primary and 4 (11.4%) in secondary infertility females [Table 4]. These findings are more or less in agreement with previous studies.[5,6,7]

It is reported that hyperprolactinemia results from long-standing primary hypothyroidism. It has been implicated in ovulatory dysfunction ranging from inadequate corpus luteal progesterone secretion when mildly elevated results into oligomenorrhea or amenorrhea in hyperthyroidism.[8] Even in the absence of hyperprolactinemia, hypothyroidism itself may contribute to infertility since thyroid hormones are necessary for maximum production of both estradiol and progesterone.[9] In the areas of endemic goiter, infertility is a common factor.[10] When treating such thyroid dysfunction with a low dosage of thyroxin, there is a slight increase in FT4 levels, leading to inhibition of TSH secretion, improvement in health status, normalization of menses, and restoration of normal fertility.

Hyperprolaction adversely affects the fertility potential by impairing the pulsative secretion of GnRH and hence interfering with ovulation.[11] This disorder results in menstrual and ovulation dysfunctions like amenorrhea, oligomenorrhea, anovulution, and galactorrhea. Altering the peripheral metabolism of estrogen and decreasing SHBG (sex hormone-binding globulin) production is another pathway by which hypothyroidism may impact fertility. These pathways may result in abnormal feedback at the pituitary level and, consequently, infertility.[12]

CONCLUSION

The present correlative study of serum prolactin and hypothyroidism levels in primary and secondary infertility is challenging for the clinician. In addition to the hormonal imbalance trend of late marriage,

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obesity and hirsutism are commonly observed in infertile females. The present study demands nutritional, genetic, pathophysiological, and endocrinological study because the exact quantum of hormone secretion factors and the exact mechanism of hormonal secretion are still unclear.

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