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Original Article

Correlation of Prolactin Level and Hypothyroidism in Both Primary and Secondary Infertility in Andhra Pradesh Females

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Abstract

Background: Infertility in females is complex global problem. It has multiple social consequences, which are usually associated with thyroid and prolactin hormone impairments.

Methods: Forty-five primary and 45 secondary infertile women were studied complete hemogram, transvaginal of perineum and abdomen, and chest-X-ray. Thyroid function test, prolactin hormone was studied using Beckman Coulter Access-II method in every patient.

Results: Prolactin hormone levels 0–20 mg/ml were highest in secondary group 29 (64.4%), 21–10 mg/ml was highest primary group 26 (57.7%) >100 observed only 1 (2.2%) secondary Menses 14 (31.1%), oligomenorrhea 21 (46.6%), and 6 (13.3%) were highest in primary group while amenorrhea was highest 10 (22.2%) in secondary group. Duration of marriage period was highest in secondary group.

Conclusion: Hyper prolectinemia with thyroid dysfunction may be a major contributor hormonal factor in primary and secondary infertility women.

Key words: Andhra Pradesh, Beckman coulter access-II, Hyper prolactonemia, Infertility, Thyroid stimulating hormone

INTRODUCTION

Fertility in female is maintained by prevailing hormonal milieu, which is balanced by hypothalamic pituitary thyroid adrenogonadal axis. Thyroid hormones have profound effects on reproduction and pregnancy. Hypothyroidism can affect fertility due to anovulatory cycles luteal phase defects, hyperprolactinemia, and sex hormone imbalance.[1,2] Thyroid dysfunction reduces the likely hood of pregnancy and adversely affect pregnancy outcome. Hyper-prolactinemia is associated with menstrual disorders such as amenorrhea, oligomenorrhea, anovulation, ovulatory, cycles with short or inadequate luteal phase, and galactorrhea.[3] Pathological hyper-prolactinemia is generally applied for situation in which prolaction increases because of some reasons other than physiologic causes. Subclinical hypothyroidism is defined as high thyroid-stimulating hormone (TSH) and normal thyroid hormones.[4] Hence, both TSH and prolactin values in primary and secondary infertility were reviewed correlated and compared.

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MATERIALS AND METHODS

Ninety infertile women, regularly visiting Obstetrics and Gynaecology Department Nimra Medical College Jupudi, Ibrahim Patnam, Krishna Nagar-521456 (Andhra Pradesh).

Inclusion Criteria

Diagnosed infertility age between 20 and 40 years was included in the study.

Exclusion Criteria

Male factor infertility, tubal factor, congenital anomalies of uro-genital system, history of thyroid surgery, or under

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medication for thyroid gland diseases were excluded from the study.

Methods

Forty-five infertile females are classified as primary infertility (Group A) and 45 secondary infertile female are classified as Group B. Complete hemogram erythrocyte sedimentation rate, transvaginal, and abdomen, chest-X-ray was studied. Thyroid function test, serum prolactin assay was carried using Backman coulter in every patient of both groups. The duration of study was August 2019–November 2020.

Statistical Analysis

Various finding of both Group A and Group B were compared with percentage. The statistical analysis was carried out in SPSS software.

OBSERVATION AND RESULTS

Table 1: Comparison of duration of marriage in both group 1–5 years after marriage 24 (53.3%) in primary 13 (28.8%) in secondary infertility group. 6–10 years–14 (31.1%) in primary 18 (40%) in secondary infertility group. More than 10 years were 7 (15.5%) in primary, 14 (31.1%) in secondary infertility group.

Table 2: Comparison of history of menstrual cycle in both group of infertility – Regular menses 14 (31.1%) in primary 13 (28.8%) in secondary infertility group. Oligomenorrhea 21 (46.6%) in primary, 19 (42.2%) in secondary infertility group, Amenorrhea 6 (13.3%) in primary, 10 (22.2%) in secondary infertility group Menorrhagia 4 (8.8%) in primary, 3 (6.6%) in secondary infertility.

Table 1: Comparison duration of marriage in both groups of infertility

Duration of Marriage	Group A (45) primary		Group B (45) secondary	
	No	Percentage	No	Percentage
1–5 years	24	53.3	13	28.8
6.10 years	14	31.1	18	40
More than 10 years	07	15.5	14	31.1

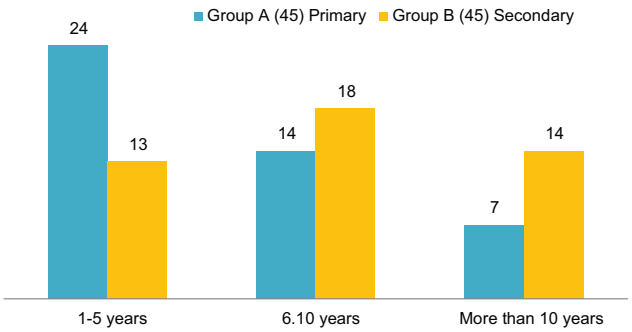


Table 3: Comparison of prolactin levels in both groups - 0–20 mg/dl – 19 (42.2%) in primary, 29 (64.4%) in secondary infertility group, 21–100 mg/ml – 26 (57.7%) in primary, 15 (33.3%) in secondary infertility group > 100 mg/ml – 1 (2.2%) observed only in secondary group.

Table 4 Comparison of TSH levels in both groups <0.4 TSH 4 (8.8%) in primary, 3 (6.6%) in secondary group, 0.4–4.7 TSH 30 (66.6%) in primary, 36 (80%) in secondary >4.7 TSH, 11 (24.4%) in primary, 6 (13.3%) in secondary infertility group.

Table 2: Comparison of menstrual cycle in both group of infertility

History of menses	Primary Group A (45)		Secondary Group B (45)	
	No	Percentage	No	Percentage
Regular menses	14	31.1	13	28.8
Oligo menorrhea	21	46.6	19	42.2
Amenorrhea	06	13.3	10	22.2
Menorrhagia	04	8.8	03	6.6

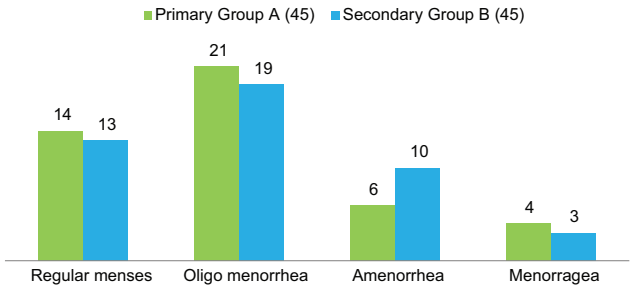


Table 3: Comparison of prolactin level in both groups of infertile females

Level of prolactin	Primary Group (A) 45		Secondary Group (B) 45	
	Number	Percentage	Number	Percentage
0–20 mg/ml	19	42.2	29	64.4
21–100 mg/dl	26	57.7	15	33.3
>100 mg/ml	0	0	01	2.2

Normal value of prolactin – 2–25 mg/ml

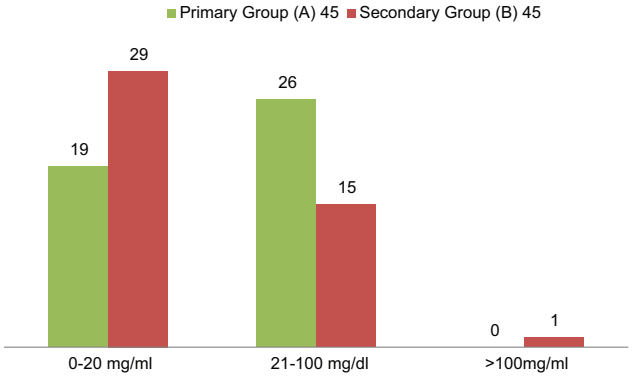
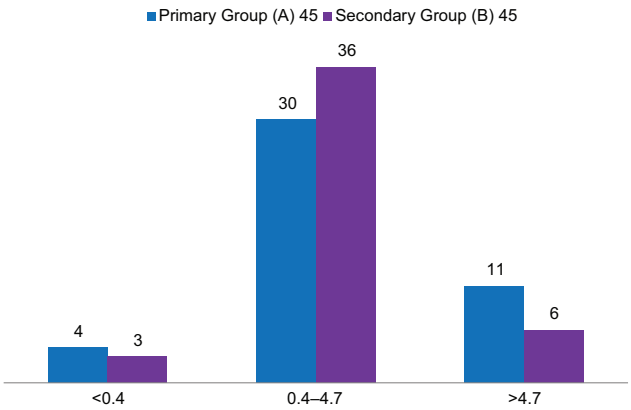


Table 4: Comparison of TSH levels in both groups

TSH levels	Primary Group (A) 45		Secondary Group (B) 45	
	Number	Percentage	Number	Percentage
<0.4	4	8.8	3	6.6
0.4–4.7	30	66.6	36	80
>4.7	11	24.4	06	13.3

Normal TSH value 0.5–4.7 MIM/ml. TSH: Thyroid-stimulating hormone



DISCUSSION

The present study correlation of prolactin and hypothyroidism in primary and secondary infertility, Duration of marriage 1–5 years was highest in primary group 24 (53.3%), 6–10 year duration was highest, 18 (40%) in secondary infertility group. Similarly more than >10 year duration was highest, 14 (31.1%) in secondary infertility group [Table 1]. History of menstrual cycle – regular menstrual cycle, 14 (31.3%) oligomenorrhea, 21 (46.6%) menorrhagia 4 (8.8%) while amenorrhea 10 (22.2%) was highest in secondary infertility group [Table 2]. The prolactin hormone level – 0.20 mg/dl was highest 29 (64.4%) in secondary infertility group, prolactin hormone level 21–100 mg/dl was highest, and 26 (57.7%) in primary infertility group prolactin level >100 mg/dl observed only, 1 (2.2%) in secondary infertility group [Table 3]. The TSH hormone levels <0.4 were highest, 4 (8.8%) in group one infertility group. TSH level 0.4–4.7 MIM/ml was highest, 36 (80%) in secondary infertility group while TSH level >4.7 was observed, 11 (24.4%) in group I (A) infertility group [Table 4]. These finding are more or less in agreement with the previous studies.[5-7]

It is reported that hyperprolactinemia resulting from long standing primary hypothyroidism. It has been implicated in ovulatory dysfunction ranging from inadequate corpus luteal progesterone secretion, when mildly elevated results into oligo menorrhea or amenorrhea occurs in hypothyroidism.[8] Even in the absence of hyper prolactinemia, 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 common factor.[10] Treating such thyroid dysfunction with low dosage of thyroxin, there is slightly increase of FT4 levels leading to inhibition of TSH secretion and improvement in health status, normalization of menstrual cycle, and restoration of fertility.

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

SUMMARY AND CONCLUSION

The present correlative study of serum prolactin and hypothyroidism levels in primary and secondary infertility are challenging to the clinician. In addition to hormonal imbalance trend of late marriage, obesity and hirsutism are commonly observed in infertile female. The present study demands nutritional, genetic, patho-physiological, and endocrinological study because exact quantum of hormone secretion factors and exact mechanism of hormonal secretion is still unclear.

The present research paper is approved by Ethical committee of Nimra Medical College Jupudi, Ibrahimpatnum, Krishna Nagar-521456 (AP).

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