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RESEARCH ARTICLE

STUDY OF THYROID PROFILE IN SECONDARY AMENORRHEA

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ABSTRACT

Background: The prevalence of secondary amenorrhea in general female population during reproductive years is 1.8 to 3%, the prevalence in college age women is 2.6 to 5% and amenorrhea may be seen as often as 20% of patients complaining of infertility and 10-20% of women with subfertility. (Morey *et al.,* 1994 and Crosignani *et al.,* 1996) Diseases of thyroid affects normal ovarian functions. Hypothyroidism causes failure of ovulation in women of reproductive age group. Hypothyroidism causes anovulatory cycles, luteal phase defects, hyperprolactinemia and hormonal imbalance.

Aims and objectives: To determine role of thyroid dysfunctions in secondary amenorrhea.

Material and Methods: This study was undertaken in Department of Biochemistry, Govt. medical college and hospital, Nagpur. Two groups of females comprising of 50 secondary amenorrhea cases as study group and 50 with regular menstrual cycle as controls were thoroughly examined and subjected to investigations for thyroid factor.

Results : The mean TSH (Thyroid stimulating hormone) levels in the secondary amenorrhea group were found to be high as compared to those of control group and they were statistically significant with p value<0.0001. The incidence of hypothyroidism in secondary amenorrhea was found to be 14%.

Conclusion: There is increased incidence of hypothyroidism in secondary amenorrhea. The relatively high occurrence of raised TSH levels in these women emphasizes the importance of TSH screening in these women.

INTRODUCTION

Secondary amenorrhea is absence of menstruation for at least 3 months in a women with previous periodic menses. (Tarannum Master-Hunter and Diana Heiman 2006) Both hyperthyroidism and hypothyroidism results in menstrual disturbances and infertility which are reversible. Prevalence of hypothyroidism in women with reproductive age (20-40 years) varies between 2 to 4%. Autoimmune thyroid diseases are most common cause. In general population prevalence of hypothyroid is 1-5%. Prevalence of menstrual abnormalities is 2-5 times higher in thyroid diseases. The impact of hypothyroid on menstrual cycle has been identified since 1950 and leads to changes in cycle length and blood flow. (Kris Poppe *et al.,* 2007) Abnormalities of thyroid functions hypo as well hyper are associated with variety of changes in reproductive system including anovulatory cycle, infertility menstrual irregularities and recurrent fetal wastage (Sharma *et al.,* 2012; Fischer *et al., et al.,* 2000). Thyroid dysfunctions interfere with various aspects of reproduction. There is strong association of hyperthyroidism or hypothyroidism with menstrual disturbance, anovulatory cycles (Binita Goswami *et al.,* 2009; Poppe and Velkeniers 2003; Doufas and Mastorako 2000)

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Hypothyroidism itself may contribute to infertility since thyroid hormones may be necessary for the maximum production of both estradiol and progesterone (Wakim *et al.,* 1995). Secondary amenorrhea is ofen associated with anovulation and infertility. The psychological implication of amenorrhea with respect to loss of feeling of feminity and worries about associated infertility in a young women needs prompt investigatins and definitive diagnosis.

MATERIALS AND METHODS

The present study is conducted in the department of biochemistry, government medical college and hospital Nagpur. A total 50 willing cases of secondary amenorrhea of at least 6 months duration attending gynecology OPD were enrolled in the study group. Exclusion criteria was those with primary amenorrhea, physiological amenorrhea, pregnancy, chronic illness, women with history of thyroid disease and on medication related to thyroid disorders. 2ml of fasting blood sample was collected. Serum is separated by centrifugation. Serum T3, T4, TSH were measured by enzyme immunoassay on STAT FAX 4300 CHROMATE ELISA Reader using ERBA Thyrokits by ERBA Diagnostics Mannheim GmbH, Germany.

RESULTS

The findings of the study were as follows

Table 1 shows age incidence in secondary amenorrhea, the maximum 40% (20) cases belonged to the age group of 25-29 years. 28% (14) cases belonged to age group 30-34 years. While 18% (9) cases were in the age group 20-24 years & 14% (7) cases in the age beyond 35 years. The controls in the present study ranged between 20 to 40 years of age. The mean age of subjects in the control group was 30.24 ± 0.77 years (mean ± SEM) and that of cases with secondary amenorrhea was 29.12 ± 0.74 years which happen to be almost a complete match.

Table 1. Age incidence

Age groups (years)	Cases of secondary amenorrhea		Control	
	No. of subjects	Percentage	No. of subjects	Percentage
20 – 24	9	18 %	9	18 %
25 – 29	20	40 %	16	32 %
30 – 34	14	28 %	15	30 %
≥35	7	14 %	10	20 %
Total	50	100%	50	100%

Table 2. shows distribution of study subjects according to the duration of secondary amenorrhea. Out of 50 cases studied, the maximum 88% (44) cases had 6-12 months of amenorrhea. 10% (5) cases had amenorrhea of 13-24 months duration. Only one case had amenorrhea of 36 months. The mean duration of secondary amenorrhea in our study was 9.93 ± 0.71 months.

Table 2. Duration of Secondary Amenorrhea

Duration of sec. amenorrhea (months)	No. of cases	Percentage
6-12	44	88 %
13-24	5	10 %
≥25	1	2 %

The mean levels of thyroid function tests are given in Table 3. The mean values of serum T3 in cases was found to be 1.055 ± 0.061 ng/ml, while in control group it was 1.161 ± 0.047 ng/ml. The mean value of T4 was found to be 8.72 ± 0.329 µg/dl in cases and in control it was 9.465 ± 0.202 µg/dl. It is evident that mean levels of serum T3 & T4 were at lower range in cases as compared with controls but the difference is not statistically significant (P > 0.05). The mean value of TSH was found to be 10.25 ± 5.21µIU/ml in cases while in control group it was 2.5 ± 0.61µIU/ml. (P< 0.0001) It is evident from Table 4 and 5 that there were total 7 cases of hypothyroidism in secondary amenorrhea. Out of which 5 cases had overt clinical hypothyroidism while 2 cases had subclinical hypothyroidism. Thus the incidence of hypothyroidism in secondary amenorrhea was found to be 14%.

Table 3. Thyroid function tests in secondary amenorrhea (n = 50)

Thyroid function test	Cases	Control	P value
T3	1.055 ± 0.061	1.161 ± 0.047	0.1762
T4	8.72 ± 0.329	9.465 ± 0.202	0.0571
TSH	10.25 ± 5.21	2.5 ± 0.61	< 0.0001

DISCUSSION

"Menstruation represents – the ultimate image of confidence in a young woman". Amenorrhea is a biologic health marker that warns health hazards. Apart from psychological implications, amenorrhea is often associated with infertility and long term sequelae in the form of osteoporosis, endometrial hyperplasia and increased risk of cardiovascular disease. As different etiologies may cause this condition, it is of prime importance to diagnose correctly and to assess accurately the underlying biochemical abnormality. The incidence of thyroid dysfunction was found to be 14% i.e. 7 out of 50 cases of secondary amenorrhea. Out of these, 5 cases showed overt clinical hypothyroidism, while 2 cases were of subclinical hypothyroidism. The mean values of serum T3 and T4 were found to be at lower range in cases as compared to the controls, but the difference is not statistically significant. The mean value of serum TSH was found to be at higher level in cases as compared to the controls which was statistically significant.

Table 4. Status of thyroid function in secondary amenorrhea (n = 50)

Thyroid status	Cases		Control	
	No.	Percent	No.	Percent
Euthyroid	43	86 %	50	100 %
Hypothyroid	7	14 %	0	0
Total	50	100 %	50	100 %

Values shown are Mean ± SEM SEM = Standard Error of Mean.
T3 values are expressed in ng/ml. T4 values are expressed in µg/dl.
TSH values are expressed in µIU/ml.

Table 5. Type of thyroid dysfunction in secondary amenorrhea (n = 50)

Thyroid dysfunctions	No. of cases	Percentage
Clinical hypothyroidism	5	10 %
Subclinical hypothyroidism	2	4 %
Total	7	14 %

Our study co-relates well with the Hernandez *et al.* (1999) and Mohammad *et al.* (2001) They found that the incidence of hypothyroidism in secondary amenorrhea to be 14.8% and 12% respectively. Hypothyroidism is characterized by low serum levels of thyroxine, increase serum TSH & decrease negative feedback on hypothalamo-pituitary-ovarian axis, thus resulting in increased secretion of TRH. This stimulates pituitary thyrotrophs thereby increasing levels of TSH. (Avasthi Kumkum *et al.,* 2006) Authors had studied association of severity of menstrual irregularities with higher serum TSH concentration. Binita Goswami *et al.* (2009) had reported amenorrhea in 31% of cases with hypothyroidism while Krasses *et al.* (1990) noted oligomenorrhea in 23% in hypothyroid cases. Thus thyroid factor must taken under consideration in patients with amenorrhea.

Thyroid disorders may influence reproductive performance in a variety of ways. During investigations of abnormal sexual development, hirsuitism, infertility and menstrual irregularities, the possibility of thyroid dysfunctions must always be considered. Subtle degree of thyroid dysfunctions among

patients presenting to gynecologist may lead to manifestations that mimic a spectrum of more common ovulatory disorders marked by galactorrhea, hirsuitism, amenorrhea or menorrhagia. Hypothyroidism alone, without hyperprolactinemia, may directly interfere with normal hypothalamic-pituitary-ovarian function resulting in amenorrhea. In less severe hypothyroidism, menorrhagia is common. This may result from chronic unopposed estrogenic stimulation. Long standing or severe hypothyroidism, particularly if accompanied by prolactinemia, is often associated with amenorrhea. (Herman Giddens *et al.,* 1997; Birmingham, Alabama 2004) The relatively high occurrence of abnormal TSH levels in women with secondary amenorrhea emphasizes the importance of thyroid function tests screening in these women.

Conclusion

There was an increase in serum TSH levels in secondary amenorrhea women as compared to control group. The relatively high occurrence of abnormal TSH levels in secondary amenorrhea emphasizes the importance of TSH screening in these women.

REFERANCES

American Family Physician 2006. April; 73(8): 1-12.

Avasthi Kumkum, Kaur Jasmine, Gupta Shweta *et al.* 2006. Hyperprolactinemia and its correlation with hypothyroidism in infertile *women. J. of Obst and Gyn of India*, 56(1): 68-71.

Binita Goswami *et al.* 2009. Correlation of prolactin and thyroid hormone concentration with mentrual pattern in infertile women. *J Reprod Infertile*,10(3):207-12

Birmingham, Alabama. 2007. Current evaluation of amenorrhea. Fertility and sterility 2004; 82(1): 266-72. *Clin Endocrinol* 66(3): 309-2

Crosignani PG, Vegetti W. 1996. A practical guide to the diagnosis and management of amenorrhea. Drugs Nov; 52(5): 671- 81.

Doufas AG, Mastorakos G. 1994. The hypothalamic-pituitary-thyroid axis and the female reproductive system. Ann N Y Acad Sci.2000;900:65-76 Fertility and Sterility July, 62 (1): 1-16.

Fischer DA, Nelson JC, Carlton EI *et al.* 2000. Maturation of human hypothalamic-pitutary-thyroid function and control. Thyroid 10:229-234.

Herman Giddens ME, Slara EJ, Wasserman RC *et al.* 1997. Secondary Sexual Characteristic and menses in Young girls seen in office practice: a study from the pediatric Research in office settings network. Pediatr, 99: 505-12.

Hernandez I, Cervera – Aguilar R, Vergara MD, Ayala AR. 1999. Prevalence and etiology of secondary amenorrhea in a selected Mexican population. *Ginecol Obstet Mex*, Aug; 67: 374-76.

Krassas GE, Pontikides N, Kaltsas T, Papadopouiou P. *et al.* 1990. Disturbance of menstruation in hypothyroidism. *Clin Endocrinol.(Oxf)*. 50(5):655-9.

Kris Poppe, Brigitte Velkeniers, Daniel Glsnoer. Thyroid disease and female reproduction.

Mohammad SZ Salem, Abdul S Eldieb, Mostafa A Shokry *et al.* 2001. Genetic aspects of secondary amenorrhea in Egyptian females. The Egyptian Journal of Medical Human Genetics 2001 Nov; 2(2): 93-108.

Morey Schachter, Zeev Shoham. Amenorrhea during the reproductive years – is it safe?

Poppe K, Velkeniers B 2003. Thyroid disorders in infertile women. *Ann Endocrinol*, 64(1);45-50

Sharma B, Kumar A, Singh CM, Kansal R. 2012. Significance of thyroid profile in infetile women. *Indian j of community health*, 24(2): 148-152.

Tarannum Master-Hunter, Diana L Heiman. Amenorrhea: Evaluation and Treatment.

Wakim AN, Polizotto SL, Burholt DR. 1995. Influence of thyroxine on human granulosa cell steroidogenesis in vitro. *J Assist Reprod Genet*. 12(4):274-7.

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