

COMPARISON OF THYROID PROFILE IN PREMENOPAUSAL AND POSTMENOPAUSAL WOMEN

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Abstract Background and Objectives: Diseases of the thyroid gland are among the most abundant disorders worldwide second only to diabetes. Normal levels of thyroid hormone are essential for normal reproductive behavior and physiology. Onset increases with age and it is estimated that 26% of premenopausal and menopausal women are diagnosed with thyroid disease. Thyroid disorders are more common in women than men. **Methods:** This study consists of two groups. The control group included 50 premenopausal women with the age 40 years or more. The study group included 50 postmenopausal women with duration not more than 5 years of menopause. Any female who had not had menstruation for a minimum duration of 1 year was considered as postmenopausal. Different thyroid function tests (Serum TSH, Serum total T3, Serum total T4) were done in both the age groups to determine thyroid status. **Results:** Comparison of thyroid profile was done between premenopausal & postmenopausal women. Data analysis was done by Z test. p value <0.05 considered as significant. Statistical analysis was done using SPSS 20.0 software. 18% of postmenopausal women had high Serum TSH, low S. T4, low S. T3 levels suggestive of hypothyroidism & 6% of postmenopausal had low S.TSH, high S.T4, S.T3 values suggestive of hyperthyroidism. **Conclusion:** We conclude that it is advisable to include thyroid screening as routine investigation in the women presenting with menopausal symptoms for the first time. Those with abnormal thyroid parameters should be treated accordingly. Those with borderline shift in thyroid parameters should be periodically screened for the same. Evaluating serum TSH alone would be sufficient to evaluate thyroid status. This simple measure would provide timely diagnosis of thyroid disorders at the time of menopause if any.

Key words:- Serum TSH, Serum total T3, Serum total T4, Premenopausal women, Postmenopausal women

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Introduction: Diseases of the thyroid gland are among the most abundant disorders worldwide second only to diabetes.¹ Normal levels of thyroid hormone are essential for normal reproductive behaviour and physiology. Onset increases with age and it is estimated that 26% of premenopausal and menopausal women are diagnosed with thyroid disease.² Thyroid disorders are more common in women than men, and in older age groups compared with younger age groups.³ Overt thyroid dysfunction is uncommon in women less than 40 years old and in men less than 60 years.

Hypothyroidism is a common feature in a broad spectrum of reproductive disorders ranging from abnormal sexual development through menstrual irregularities to infertility. The impact

of hypothyroidism on the menstrual cycle has been identified since the 1950s and leads to changes in cycle length and blood flow.

Women in their 40s and 50s often suffer from symptoms like fatigue, moodiness, erratic periods, sleep problems, loss of sex drive and weight gain. But these are the symptoms of hypothyroidism too which go unnoticed.

Rather than suspecting thyroid problems and getting the proper tests and evaluation, however, women are often being given oestrogen and progesterone hormone treatments (HRT), antidepressants or sleeping pills- which miss the real problem entirely, or even make symptoms worse.

Lot has been documented correlating thyroid status and menstrual irregularities. Despite the fact that diseases of thyroid gland particularly hypothyroidism is common in female and its prevalence increases with age and share many of the symptoms with menopause transition, only few studies exist that correlate thyroid status with menopause. It is hard to find this type of study in Indian population, so this study was done to evaluate & compare thyroid profile in premenopausal & postmenopausal women and to assess whether thyroid screening can be adopted as routine investigation in women presenting with menopausal symptoms.

Materials and Methods: Present study was conducted at Civil Hospital Ahmedabad. In this study certain thyroid parameters of premenopausal & postmenopausal women were compared. The control group included 50 premenopausal women with the age 40 years or more. The study group included 50 postmenopausal women with duration not more than 5 years of menopause. Any female who had not had menstruation for a minimum duration of 1 year was considered as postmenopausal.

Known cases of thyroid disorders or any other endocrine disorders were excluded from the study. Known cases of hypertension, diabetes mellitus, obesity and systemic diseases were also excluded.

To study the effect of "Menopause Transition" per se, premenopausal subjects more than 40 years of age and postmenopausal subjects with menopause duration not more than 5 years were included. After eliciting history in detail general and systemic examination was done. The informed consent was obtained. Their blood samples were collected and examined for Serum TSH level, Serum T3 level, Serum T4 level by Chemiluminescent Microparticle Immunoassay (CMIA) method using ARCHITECT machine of ABBOTT company.

Results: Comparison of thyroid profile was done between premenopausal & postmenopausal women. Data analysis was done by Z test. p value <0.05 considered as significant. Statistical analysis was done using SPSS 20.0 software.

Table 1(A). Distribution of subjects according to Serum TSH levels.

Serum TSH (μ IU/ml)	Premenopausal women	Postmenopausal women
S. TSH (0.4-4 μ IU/ml)	50	38
S. TSH (>4 μ IU/ml)	0	9
S. TSH (<0.4 μ IU/ml)	0	3

Table 1(B). Mean \pm SD & p value of TSH levels.

S. TSH (μ IU/ml)	Mean \pm SD		p value
	Premenopausal	Postmenopausal	
	2.02 \pm 0.927	3.30 \pm 3.632	0.055

As per Table 1(A) all premenopausal subjects had normal S.TSH values, 38 postmenopausal subjects had normal S.TSH values, while 9 had high S.TSH values and 3 had low S.TSH values.

As per Table 1(B) Mean \pm SD values of S.TSH levels of premenopausal & postmenopausal subjects were 2.02 \pm 0.927 & 3.30 \pm 3.632 respectively and p value is 0.055.

So our study states that 9 postmenopausal subjects (18%) had high TSH values suggestive of hypothyroidism and 3 postmenopausal subjects (6%) had low TSH values suggestive of hyperthyroidism. But the p value is 0.055 which is statistically not significant.

Table 2(A). Distribution of subjects according to Serum T4 levels.

Serum T4 (nmol/L)	Premenopausal women	Postmenopausal women
S. T4 (59-153 nmol/L)	50	38
S. T4 (< 59 nmol/L)	0	9
S. T4 (>153 nmol/L)	0	3

Table 2(B). Mean \pm SD & p value of T4 levels.

S. T4 (nmol/L)	Mean \pm SD		p value
	Premenopausal	Postmenopausal	
	104.88 \pm 22.02	96.98 \pm 34.14	0.112

As per Table 2(A) all premenopausal subjects had normal S.T4 values, 38 postmenopausal subjects had normal S.T4 values, while 9 had low S.T4 values and 3 had high S.T4 values.

As per Table 2(B) Mean \pm SD values of S.T4 of premenopausal & postmenopausal subjects were 104.88 \pm 22.02 & 96.98 \pm 34.14 respectively and p value is 0.112.

So our study states that 9 postmenopausal subjects (18%) had low T4 values suggestive of hypothyroidism and 3 postmenopausal subjects (6%) had high T4 values suggestive of hyperthyroidism. But the p value is 0.112 which is statistically not significant.

Table 3(A). Distribution of subjects according to Serum T3 levels.

Serum T3 (ng/ml)	Premenopausal women	Postmenopausal women
S. T3 (0.56-1.88 ng/ml)	50	38
S. T3 (<0.56 ng/ml)	0	9
S. T3(>1.88 ng/ml)	0	3

Table 3(B). Mean \pm SD & P value of T3 levels.

S. T3 (ng/ml)	Mean \pm SD		p value
	Premenopausal women	Postmenopausal women	
	1.02 \pm 0.141	0.92 \pm 0.144	0.132

As per Table 3(A) all premenopausal subjects had normal S.T3 values, 38 postmenopausal subjects had normal S.T3 values, while 9 had low S.T3 values and 3 had high S.T3 values.

As per Table 3(B) Mean \pm SD values of S.T3 of premenopausal & postmenopausal subjects were 1.02 \pm 0.141 & 0.92 \pm 0.144 respectively and p value is 0.132.

So our study states that 9 postmenopausal subjects (18%) had low T3 values suggestive of hypothyroidism and 3 postmenopausal subjects (6%) had high T3 values suggestive of hyperthyroidism. But the p value is 0.132 which is statistically not significant.

Discussion: Subjects were selected from a very narrow range of 40 to 55 years of age, so as to study the effect of menopause transition on thyroid status.

MaryFran Sowers et al. studied "TSH concentrations and menopausal status in

women at the midlife, Study of Women's Health Across the Nation (SWAN)", a community-based multiethnic study of the natural history of the menopausal transition. Enrolees were 42–52 years old (pre and early perimenopausal) African American, Caucasian, Chinese, Hispanic and Japanese women (n = 3242). They observed 6.2% of women with TSH > 5.0 mIU/ml and 3.2% with TSH < 0.5 IU/ml, cutpoints that have been used to encompass clinical and sub-clinical hypo- and hyperthyroidism, respectively. African American women had significantly lower mean TSH concentrations than Caucasian, Hispanic and Chinese women. Of the more than 15 menopause symptoms evaluated, only fearfulness was associated with having a TSH value > 5.0 mIU/ml (P < 0.008) or < 0.5 mIU/ml (P < 0.02).⁴

Marie Faughnan et al. studied "Screening for thyroid disease at the menopausal clinic." Standard thyroid profiles (Total T4, T3 uptake, calculated free thyroxine index (FTI), and sensitive thyroid stimulating hormone (TSH) were obtained in 500 consecutive patients seen at such a clinic over 18 months. Twenty-three carefully selected, age-matched, perimenopausal hospital employees served as a reference group for the TRH response test. Based on the observed overall prevalence of 7.2% of thyroid disease (6.6% of hypothyroidism) and on the detection of 4.6% of new cases of thyroid dysfunction (half of them with overt disease). Their data also indicate that TSH alone should be sufficient as a screening tool if carefully determined reference values are used.⁵

Ranawat A., Yadav D., Solanki R.K. assessed TSH and lipid profile in depressed postmenopausal women. They found that TSH Level is significantly associated with depression in postmenopausal women. Serum total cholesterol, triglyceride, TSH levels were significantly higher and HDL levels were significantly lower in the depressed group,

while LDL and VLDL levels were comparable in both the groups.⁶

Legier V. Rojas, Karen Nieves et al. assessed TSH status in Hispanic women during the menopause transition. They found no significant difference between TSH levels and menopausal stage. They observed no difference between pre and postmenopausal states.⁷

Conclusion: Our study demonstrates that 18% of postmenopausal women have thyroid profile suggestive of hypothyroidism & 6% of the same have thyroid profile suggestive of hyperthyroidism. The difference of thyroid parameters between pre & post menopausal women does not show statistical significance. Further studies with larger sample size in Indian population are required to evaluate association between thyroid status and menopause transition.

Therefore, it is advisable to include thyroid screening as routine investigation in the women presenting with menopausal symptoms for the first time. Those with abnormal thyroid parameters should be treated accordingly. Those with borderline shift in thyroid parameters (high or low) should be periodically screened for the same. Evaluating serum TSH alone would be sufficient to evaluate thyroid status. This simple measure would provide timely diagnosis of thyroid disorders at the time of menopause if any.

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