

Research Article**A Study on Prevalence and Distribution of Subclinical Hypothyroidism in Rural Women****S. Senthilkumaran^{1*}, V. Sathyaprakash², A. Sundhararajan³**^{1,3}Department of Biochemistry, Chennai Medical College Hospital and Research Centre, (SRM GROUP) Irungalur, Tiruchirappalli, Tamil Nadu, India.²MBBS Third year student, Chennai Medical College Hospital and Research Centre, Irungalur, Tiruchirappalli, Tamil Nadu, India***Corresponding author**

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Abstract: Subclinical hypothyroidism is mainly diagnosed by laboratory results as there are no presenting clinical signs and symptoms. There are only few studies done in prevalence and patterns of age distributions of subclinical hypothyroidism in India. Therefore the study was designed to estimate the prevalence and distribution of subclinical hypothyroidism in rural women. This study is a hospital based cross sectional study done at rural women attending Chennai Medical College Hospital and Research Centre, a tertiary care centre, Tiruchirappalli, Tamilnadu, India. More than 12 years of age group including adolescent, pregnant, older age groups are selected and investigated for subclinical hypothyroid by doing FT3, FT4 and TSH concentrations. Thyroid function tests are done in Clinical biochemistry Department by Enzyme Linked Immuno Sorbident Assay. Total number of 417 patients enrolled this study, 37(9%) patients were found to diagnose as subclinical hypothyroidism, 32(8%) patients were found to be hypothyroid patients. The mean value of Subclinical hypothyroid Group were FT3 137.23±40.35, FT4 7.3 ± 51.65, TSH 9.26±3.06. Hypothyroid group were FT3 51.98±16.60, FT4 3.76±1.38, TSH 18.86±11.36, Euthyroid group were FT3 131.74±8.33, FT4 7.64±0.13, TSH 2.63±0.14, There is an increase in distribution of number of cases of subclinical hypothyroidism as the age advances from 15 years to 67 years. (15-25 years n=2, 26-35 years n=4, 36-45 years n=6, 46-55years n=11, 55-67 years n=14). The present study has identified that the prevalence of subclinical hypothyroidism in females is found to be 9%, which is more when compared to frank hypothyroidism and the pattern of distribution of subclinical hypothyroidism increases as the age advances.**Keywords:** Subclinical hypothyroidism, TSH, FT3, FT4, frank hypothyroidism, Euthyroid.

INTRODUCTION

Subclinical hypothyroidism is the condition where there is an elevated Thyroid Stimulating Hormone concentration (TSH) in the presence of normal serum free thyroxine (FT4), triiodothyronine (FT3) concentrations [1]. Subclinical hypothyroidism is an exclusive laboratory diagnosis, where most of the patients are asymptomatic without any typical presenting signs and symptoms. The reference ranges for the parameters are FT3:75-220mg/dl, FT4:4-11mg/dl and TSH:0.5-5milliunits/l. When TSH levels are more than 5milliunits/l with normal FT3 & FT4 levels, then it is diagnosed as subclinical hypothyroidism. It is evident from previous studies the prevalence of subclinical hypothyroidism is widespread among female populations [2].

In about 2-5% of patients having subclinical hypothyroidism may progress to overt hypothyroidism. Subclinical hypothyroidism is associated with co-morbidities such as lipid abnormalities, hip fractures,

cognitive dysfunctions and pulmonary complications [3-5]. In women subclinical hypothyroidism associated with Dysfunctional uterine bleeding, increased incidence of preeclampsia and pregnancy outcomes [6, 7].

There are only few studies available in prevalence and distribution of subclinical hypothyroidism in females in India. At present there are no standard recommended criteria for screening, management and follow up for subclinical hypothyroidism. The estimation of prevalence and age distribution shall elucidate to plan strategies for setting up cutoff age for screening for subclinical hypothyroidism in women. Further community based studies and metaanalysis in the prevalence, distribution and associated co morbidities will aids in framing policies and recommendations regarding effective management and follow up of subclinical hypothyroidism .With this background, the present study aims to find the prevalence of subclinical

hypothyroidism in rural women attending Chennai Medical College Hospital and Research Centre, Tiruchirappalli, Tamilnadu.

MATERIALS AND METHODS

Women attending Chennai Medical College Hospital and Research Centre, including adolescent, pregnant, older age groups are selected and investigated for subclinical hypothyroid. The study was performed between April 1st to May 31st, 2012. The total number of patients enrolled was (n=417). About 3 ml of venous blood was collected for estimation of Thyroid function tests, which is done in Clinical Biochemistry Laboratory, by ELISA (Enzyme Linked Immuno Sorbent Assay) method. The reference range for the parameters are FT3:75-220mg/dl, FT4:4-11mg/dl and TSH:0.5-5milliunits/l. When TSH levels are more than 5milliunits/l with normal FT3 & FT4 levels, then it is diagnosed as subclinical hypothyroidism. Informed Consent was obtained from patients enrolled for the present study. Patients who are fitting into the inclusion criteria and willing to enroll in our present study are selected. The present study got approval and clearance from institutional ethics committee. Women age group more than 12 years are included in the present study and the patients on thyroid medications, having history of recent surgery, chronic infections, malignancy, injury are excluded from the present study. The study was done as ICMR Short term studentship (STS) project 2013 by Indian Council of Medical Research (ICMR).

RESULTS AND DISCUSSION

From the total number 417 patients enrolled, out of which 37(9%) patients are subclinical hypothyroid females and 32(8%) patients are frank hypothyroid cases. Our study shows there is prevalence of subclinical hypothyroid cases-9% whereas the frank hypothyroid cases are 8% (Fig. 1). There is increased prevalence of subclinical hypothyroid cases when compared to frank hypothyroid cases. The mean age group of the study was 29 years. The upper limit was 67 years and lower limit was 15 years. There is age related increase in the distribution of number of cases of subclinical hypothyroid patients which is documented in Fig. 2. It is evident that there is increase in number of cases of subclinical hypothyroidism as the age advances from 16 years to 67 years. The distribution of number of subclinical hypothyroid cases with age wise distribution is age between 16-25 n=2, 26-35 n=4, 36-45 n=6, 46-55 n=11, 56-67 n=14.

Subclinical hypothyroidism is a laboratory rather than clinical diagnosis and is associated with illness like dyslipidaemia, vascular, neurological

complications. Previous Studies done at coastal Andhra Pradesh, Kashmir valley and Mumbai showed that there is significant prevalence of subclinical hypothyroidism in females [8-10]. The total number of subclinical hypothyroidism in females enrolled in our study was 37 and male patient was 8 in the ratio of 4:1. This shows that the prevalence of sub clinical hypothyroidism is more prevalent in females when compare to males. Our result correlates well with the previous study on the distribution of subclinical hypothyroidism [10].

Our study corroborates with these previous studies and document that there is prevalence of subclinical hypothyroidism in rural women also. The prevalence of subclinical hypothyroidism is more than overt hypothyroidism in the present study.

Studies shown there is an increased prevalence of subclinical hypothyroidism after the age of 35. It is evident from our present study that the prevalence distribution of subclinical hypothyroidism is increasing as the age advances from 15 to 67. The study shows the occurrence of subclinical hypothyroidism noted at the age of 15 and the distribution of number of cases increases as the age advances. The increase of subclinical hypothyroid case with age shall guide us to frame an appropriate cut off age for screening of elderly females to rule out subclinical hypothyroidism. The diagnosis of subclinical hypothyroidism is based solely on thyroid function test results, since the patients does not possess any signs and symptoms pertaining to subclinical hypothyroidism, so rule out subclinical hypothyroidism screening of the patients by doing thyroid function test only.

The limitation of the present study is that it has not estimated the associated illness, follow up of the patients, whether it is converted into overt hypothyroidism or it is reversed into euthyroid state, therapeutic intervention trails with thyroxine supplementation in patients with subclinical hypothyroidism. The study provide supportive evidence that subclinical hypothyroidism is prevalent in rural women also and it documents that the prevalence of subclinical hypothyroid cases with regard to the age. It was evident from our study that the prevalence of subclinical hypothyroidism increases as age advances. Currently there is no standard guidelines for age of screening, follow up, and intervention in subclinical hypothyroidism. Testing large number of samples, longitudinal follow up, metaanalysis study will enable to frame strategies for screening of subclinical hypothyroidism.

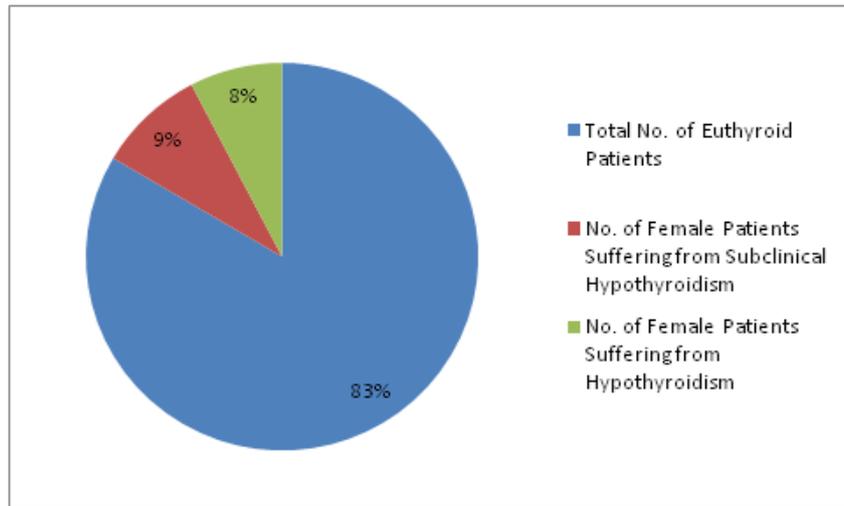


Fig. 1: Distribution of thyroid status among total number of female patients

Fig. 1 shows among the total number of 417 patients enrolled in our study, 37 (9%) patients were found to be females with subclinical hypothyroidism,

32 (8%) patients were found to be female frank hypothyroid.

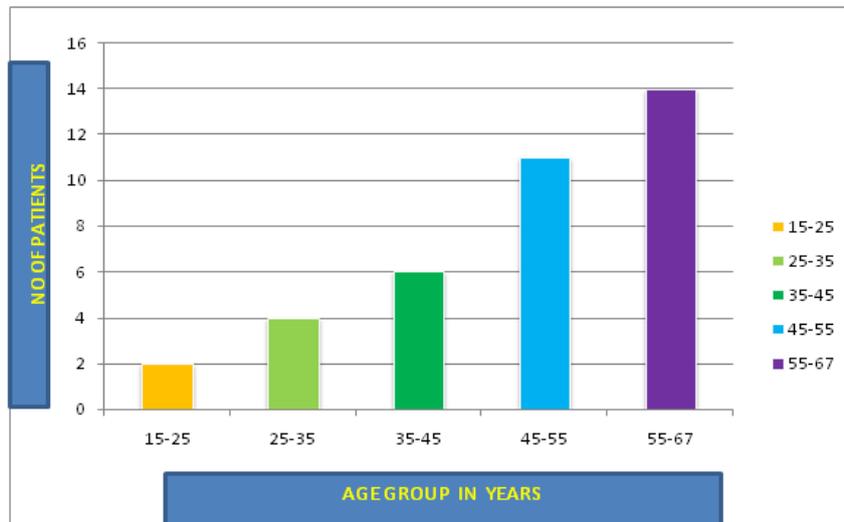


Fig. 2: Age wise distribution among total number of subclinical hypothyroidism patients

Fig. 2 shows age wise distribution among total number of subclinical hypothyroidism patients in Y axis plotted against age wise distribution in X axis. There is increase in distribution of number of patients of subclinical hypothyroidism as the age advances from 16 years to 67 years.

CONCLUSION

The present study has identified that the prevalence of subclinical hypothyroidism in females is found to be 9%, which is more when compared to frank hypothyroidism and the pattern of distribution of subclinical hypothyroidism increases as the age advances. The present study concluded to do further studies and metaanalysis to estimate the overall prevalence of subclinical hypothyroidism in our country.

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