

Sub-Clinical Hypothyroidism-A Cross-Sectional Study among Medical Students in Vijayapura District Karnataka

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ABSTRACT

Introduction: Sub Clinical Hypothyroidism (SCH) is diagnosed when peripheral thyroid hormone levels are within normal reference laboratory sense. But the serum TSH levels are mildly elevated. This condition occurs in very less people of the general population. SCH is probably a cardiovascular risk factor among young adults, so it is very important to diagnose it early.

Objectives: To find proportion of Sub-clinical Hypothyroidism among Medical students.

Material and Methods: Apparently healthy first year MBBS students were enrolled after taking informed verbal consent from them and were subjected to thyroid assay. General history taking, clinical examination, anthropometric and physiological parameters were recorded. Observations-Present study found there is increase in TSH levels in Seven students (M:F 4:3) and FT₃, FT₄ were within normal range. Also found positive correlation between TSH and age group between FT₃ and BMI and FT₃ systolic BP.

Conclusion: Thyroid profile (T₃,T₄,TSH) along with physiological (cardiac) and anthropological parameters have shown significance attributing to the cardiovascular morbidity in future.

Key words: Sub clinical hypothyroidism, Medical students, TSH, Cardiac parameters

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INTRODUCTION

Subclinical Hypothyroidism (SCH) is a commonly encountered laboratory finding in clinical practice, characterised by elevated levels of Thyroid-Stimulating Hormone (TSH) in serum in the presence of normal serum levels of free Thyroxine (FT₄), as compared with population-based reference ranges for these values. Individuals classified as having SCH are usually asymptomatic, although signs and symptoms of hypothyroidism, such as dry skin, fatigue, cold sensitivity, constipation and muscle cramps, are sometimes present. SCH may or may not progress to overt hypothyroidism [1,2].

Subclinical hypothyroidism is the most prevalent thyroid disorder affecting 3–15% of the adult population. Its incidence increases with advanced age, female gender and greater dietary iodine intake [3].

In India, it has been observed that 12% of children aged 5-16 years were found to have thyroid dysfunction in which TSH levels above the reference range. However, the prevalence of thyroid dysfunction in children and adolescents is lesser than adult population where the prevalence was found 19.6%. The abnormalities most frequently associated in the paediatric population are weight gain, increased cholesterol levels, impaired growth velocity, anaemia, sleepiness, weakness, and impaired psychomotor and cognitive development [4,5].

It has been suggested that Subclinical Hypothyroidism (SCH), characterized by mild increase in Serum Thyrotropin (TSH) together with a normal serum free Thyroxine (FT₄) level, is a risk factor for development of systemic diseases such as atherosclerosis, cardiovascular diseases as well as neuropsychiatric disorders [6].

With this background a study was planned to find the proportion of Sub-clinical hypothyroidism among medical students and that may help in early diagnosis and treatment of the condition.

MATERIALS AND METHODS

A cross-sectional study was conducted among first year MBBS students of BLDE (DU) Shri. BM. Patil Medical

College of Vijayapura district of North Karnataka during the year 2015.

Sample size was calculated by using the formula: $n = z^2 p(1-p)/d^2$ Where Z=z statistic at 5% level of significance, d is margin of error (5%) and p is proportion of Sub-clinical hypothyroidism among adolescents (4.9%) which came around 73 adolescents minimum [4].

Inclusive criteria apparently healthy young students of first year (adolescent age group) MBBS students willing to participate in study were enrolled. Exclusion criteria those students who were suffering from chronic diseases, congenital heart diseases, allergic disorders, taking medications with any history of Hypo or Hyper thyroids in past and in family.

All are subjected to thyroid assay like FT₃, FT₄, TSH levels after taking General history, clinical examination, anthropometric (height, weight, BMI) and cardiac

parameters (Blood pressure, Mean arterial pressure, Pulse pressure). Students were given all the information regarding purpose of study priory (verbal informed consent was taken) and Institutional Ethics Committee permission was also obtained.

The information collected were entered into the respective student's proforma and analysed for frequency distribution, t-test and correlation coefficient.

RESULTS

Total 87 out of 150 apparently healthy MBBS students were enrolled as per the criteria into the study. The proportion of Sub-clinical Hypothyroidism (SCH) is seven out of 87 (08%) (Table 1).

Table 1: comparison of Baseline characteristics of the subjects.

Parameters	n=80		n=07		Unpaired t-test
	Mean	SD	Mean	SD	(p value)
Age (yrs)	18	0.59	18	0.6	p>0.99
Height (cm)	165	10.8	155	4	p=0.01*
Weight (kg)	62	12.4	60	5.2	p=0.67
Body Mass Index	22	3	21	3.18	0.4
Systolic Blood Pressure	121	8.9	120.2	9.15	0.81
Diastolic Blood Pressure	73	9.11	74.4	9.48	0.69
Pulse Pressure	48	11.6	45	7.64	0.5
Mean Arterial Pressure	89	7.18	114.5	11.7	0.0001*

Statistically significant

According to Table 1, there was significant difference found in the Height and Mean Arterial Pressure (MAP) between students with Normal thyroid profile and SCH.

Other parameters like weight, BMI, SBP, DBP and PP were not shown any significant difference among two groups (Table 2).

Table 2: Comparison of thyroid profile of the subjects.

Parameters	n=80		n=07		Unpaired t-test
	Mean	SD	Mean	SD	p value
FT ₃	3.07	0.32	3.25	0.36	0.15
FT ₄	1.2	0.13	1.13	0.15	0.17
TSH	2.78	2.01	7.81	3.39	0.0001*

Statistically significant

Table 2 shows the comparison of thyroid profile among both groups, according which significantly higher levels of TSH was found among students with SCH compared to

normal students with thyroid profile. Free T₃ and T₄ was found nearly same in both group and difference was not found statistically significant (Table 3).

Table 3: Bivariate correlations between free thyroid hormones and age, BMI, Blood pressure.

	Age	BMI	SBP	DBP	PP	MAP
T ₃						
Pearson correlation	-0.026	0.303	0.359	-0.078	0.223	-0.123

p value	0.809	0.004	0.001	0.473	0.632	0.793
T ₄						
Pearson correlation	-0.072	-0.036	0.23	-0.124	0.51	-0.537
p value	0.509	0.741	0.032	0.251	0.242	0.214
TSH						
Pearson correlation	0.244	0.047	0.106	0.087	0.035	0.318
p value	0.023	0.649	0.33	0.423	0.53	0.486

Table 3 shows Correlation between free thyroid hormones and other covariates in all the subjects. There was significant positive correlation between TSH and age ($p < 0.05$). Also, a positive correlation between free T₃, T₄ with SBP ($p < 0.01$) was found. There was also a significant correlation between free T₃ and BMI ($p < 0.05$).

There was no significant correlation between sub-clinical hypothyroidism and Age, BMI, cardiac parameters of students with Sub-clinical Hypothyroidism.

DISCUSSION

Present study found there is increase in TSH levels in Seven students (M: F 4:3) and FT₃, FT₄ were within normal range. Also found positive correlation between TSH and age group between FT₃ and BMI and FT₃ systolic BP.

4 studied the prevalence of thyroid dysfunction among 328 adolescents studied, the prevalence of thyroid dysfunction was found to be 10.4% respectively. The prevalence of subclinical hypothyroidism in children was 4.9% in adolescents. Significantly elevated serum levels of total cholesterol, TSH and TGL were observed in SCH subjects when compared to euthyroid subjects ($p < 0.05$) However, no difference was noticed in the levels of total T₃, total T₄ and LDL cholesterol between SCH and thyroids.

Retrospective data analysis 10-19 years and found Subclinical hypothyroidism was common in the obese group and the concentrations of TSH were linked with the lipid profile. Body Mass Index (BMI) was positively correlated with serum concentrations of the TSH and negatively correlated with serum concentrations of FT₄ after adjusting for age [7].

Demonstrated that the obese adolescents with Non-alcoholic Fatty Liver disease and subclinical hypothyroidism had a more adverse cardiovascular risk profile like cholesterol, triglycerides and LDL [8].

Found Children and adolescents with SCH were found to have adverse cardiovascular risk profile like high BMI. Waist to height ratio, LDL, triglycerides, TG-HDL ratio, non-HDL cholesterol [9].

Literature review and found that Sub-clinical Hypothyroidism in children is a remitting process with a low risk of evolution toward overt hypothyroidism. Most of the subjects reverted to Euthyroidism or remained SH,

with a rate of evolution toward overt hypothyroidism ranging between 0 and 28.8% [10].

Majority of studies were highlighted the occurrence of SCH among children, hence more clinical studies should be done to explore the effects of sub-clinical hypothyroidism among adolescents.

CONCLUSION

Thyroid profile (T₃, T₄, TSH) along with physiological (cardiac) and anthropological parameters have shown significance attributing to the cardiovascular morbidity in future. Early diagnosis of the condition and prompt treatment will reduce the morbidity associate with Hypothyroidism among the students in future.

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