



ASSOCIATION OF THYROID FUNCTION AND BMI AMONG HEALTHY ADULTS IN MANIPUR

Physiology

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ABSTRACT

Thyroid dysfunctions are amongst the most common endocrinopathies across the world and an estimated 200 million individuals worldwide suffer from this disease. Obesity is considered a worldwide health problem with its prevalence increasing steadily all over the world. It is a condition in which excess body fat has accumulated to the extent that it may have a negative effect on health leading to a reduced life expectancy and increased health problems. **Material and Methods:** The study is conducted in the Department of Physiology, Regional Institute of Medical Sciences (RIMS), Imphal. The study population will comprise of apparently normal healthy volunteers who are employees of Regional Institute of Medical Sciences (RIMS), Imphal, in the age range of 20 to 60 years irrespective of sex, socio-economic status and ethnicity. **Results:** The result showed that serum TSH and T3 are significantly increase in subjects with increased BMI compared to normal subjects. **Conclusion:** From these above findings, it can be concluded that the thyroid function might be one of the important factors that influences body weight thereby obesity. Early screening of thyroid function tests with increase in body weight will be helpful in early intervention in obese peoples and management of obesity.

KEYWORDS

Obesity, Thyroid function

INTRODUCTION

Thyroid dysfunctions are amongst the most common endocrinopathies across the world and an estimated 200 million individuals worldwide suffer from this disease. Obesity is considered a worldwide health problem with its prevalence increasing steadily all over the world. It is a condition in which excess body fat has accumulated to the extent that it may have a negative effect on health leading to a reduced life expectancy and increased health problems. Obesity is a proinflammatory state that increases the risk of several chronic diseases encompassing hypertension, dyslipidaemia, diabetes, cardiovascular disease, asthma, sleep apnoea, osteoarthritis and several cancers in adults. Many factors have been found to effect a person's weight, including lifestyle choices like nutritional behaviour and physical activity, as well as genetic and environmental factors-for example, where someone lives and food availability in the community. The relationship between obesity and thyroid is complex and bidirectional.

As not many studies have been done on the association between thyroid function and anthropometric indices of obesity in Manipur and in view of the conflicting reports, this study is undertaken in an attempt to further understand the relation between thyroid function and obesity in our ethnic setting.

MATERIALS AND METHODS

The study is conducted in the Department of Physiology, Regional Institute of Medical Sciences (RIMS), Imphal. The study population will comprise of apparently normal healthy volunteers who are employees of Regional Institute of Medical Sciences (RIMS), Imphal, in the age range of 20 to 60 years irrespective of sex, socio-economic status and ethnicity.

Inclusion Criteria

All normal healthy volunteers who are employees of Regional Institute of Medical Sciences (RIMS), Imphal, in the age range of 20 to 60 years irrespective of sex, socio-economic status and ethnicity.

Exclusion Criteria

- Subjects having diabetes mellitus, hypertension, history of metabolic syndrome, renal diseases, thyroid disorders, chronic liver diseases, congestive heart diseases and malignancy.
- Pregnant woman
- Subjects using medication affecting thyroid function.

Data Collection Procedure

The study was conducted at the Department of Physiology, Regional Institute of Medical Sciences (RIMS), Imphal India. After taking approval from the Scientific Research and Ethics Board, subjects who fulfil the inclusion criteria was taken up for the study.

First, the purpose of the study were explained to study subjects in the local language with the help of the information sheet. An informed written consent was taken from all the subjects.

After taking informed consent, all study participants was subjected to detailed history, general physical examination such as height, weight and findings was recorded in case proforma sheet. All the enrolled healthy adults will be divided into three groups on the basis of their BMI as per the criteria of Asian Indian guideline; Healthy normal: 18.5-22.9 Kg/m², Overweight: 23-24.9 Kg/m² and Obese: ≥25 Kg/m².

RESULTS AND OBSERVATION

The present study was studied based on the collected data of (168) participants of both genders with the age group of 20 to 60 years. To comparisons of Thyroid Hormone levels between BMI groups.

Table 1: Comparisons Of Thyroid Hormone Levels Between Bmi Groups

Parameter (s)	Normal (n=33)	Overweight (n=36)	Obese (n=31)	*p-value	#p-value	\$p-value
Serum TSH (μIU/ml)	1.98 ± 0.55	2.39 ± 1.08	4.33 ± 0.46	0.01	0.01	0.01

Serum T3 (ng/ml)	2.1 ± 0.21	2.54 ± 0.52	3.8 ± 0.1	0.01	0.01	0.01
Serum T4 (µg/dl)	10.09± 2.67	10.11 ± 2.6	10.22 ± 3.45	0.01	0.01	0.01

*Comparison between normal and overweight subjects, #Comparison between normal and obese subjects, \$Comparison between overweight and obese subjects;

Table 1 shows the comparison of thyroid hormone levels between the BMI groups. It was observed that mean serum TSH in overweight (2.39 ± 1.08 µIU/ml) and obese groups (4.33 ± 0.46 µIU/ml) were significantly increased ($p < 0.05$) as compared to normal (1.98 ± 0.55 µIU/ml). The difference in mean TSH between overweight and obese was also significant. The mean serum T3 in overweight (2.54 ± 0.52 ng/ml) and obese groups (3.8 ± 0.1 ng/ml) were also significantly increased as compared to normal group (2.1 ± 0.21 ng/ml). There was also significant difference between mean serum T3 levels between overweight and obese groups. However, mean Serum T4 (µg/dl) show no significant differences between the groups in study subjects ($p > 0.05$).

DISCUSSION

This observational cross-sectional study showed that the mean serum TSH and T3 are significantly increase in subjects with increased BMI compared to normal subjects. This was in contradictory to the study done by Samananda et al¹, Manji et al² showed no differences in TSH levels between non-obese and obese individuals may imply that TSH and BMI are not dependent determinants.

Since thyroid hormone affects basal metabolic rate, generates heat, stimulates gluconeogenesis, and both lipolysis and lipogenesis, thyroid hormone activity may be reflected not only in blood levels but also in biological effects. A high serum TSH concentration may be the result of a lower thyroid function which may lead to a lower basal metabolic rate and obesity This same findings of studies conducted by Bhat R et al³, Al Makwane et al⁴ found that mild thyroid dysfunction in the form of subclinical hypothyroidism is linked to significant changes in body weight and represents a risk factor for overweight and obesity.

LIMITATION

1. Sample size is small.
2. Further studies are required to elaborate the finding

CONCLUSION

The present study showed that serum TSH and T3 are significantly increase in subjects with increased BMI compared to normal subjects.

The present study we can conclude that thyroid function might be one of the important factors that influences body weight thereby obesity. Early screening of thyroid function tests with increase in body weight will be helpful in early intervention in obese peoples and management of obesity. They should be advised appropriate lifestyle modification to prevent development of obesity and subsequent morbidity.

Prospective and population-based studies on a large scale are however required to confirm the association.

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