

Available online at www.sciencedirect.com

ScienceDirect

Biomedical Journal

journal homepage: www.elsevier.com/locate/bj

Original Article

Thyroid functions and serum lipid profile in metabolic syndrome



Manish Gutch^{a,*}, Sumit Rungta^a, Sukriti Kumar^b, Avinash Agarwal^a,
Anesh Bhattacharya^c, Syed Mohd Razi^d

^a Department of Medicine, King George's Medical College, Lucknow, U.P, India

^b Department of Radiodiagnosis, King George's Medical College, Lucknow, U.P, India

^c Department of Cardiology, RML Hospital, Lucknow, U.P, India

^d Department of Endocrinology, LLRM Medical College, Meerut, U.P, India

ARTICLE INFO

Article history:

Received 25 June 2015

Accepted 30 December 2016

Available online 30 May 2017

Keywords:

Thyroid hormones

Metabolic syndrome

Serum lipid profile

ABSTRACT

Background: Thyroid hormones are known to affect energy metabolism. Many patients of metabolic syndrome have subclinical or clinical hypothyroidism and vice versa. To study the correlation of thyroid profile and serum lipid profile with metabolic syndrome.

Method: It is a hospital based cross sectional case-control study carried out in tertiary care health center, we studied thyroid functions test and serum lipid profile in 100 metabolic syndrome patients according to IDF criteria and a similar number of age, gender and ethnicity matched healthy controls.

Result: We found that serum HDL was significantly lower ($p < 0.001$) in cases (41.28 ± 8.81) as compared to controls (54.00 ± 6.31). It was also found that serum LDL, VLDL, triglyceride levels and total cholesterol were found to be significantly higher ($p < 0.001$) in cases than controls. Serum TSH levels of subjects in cases group (3.33 ± 0.78) were significantly higher ($p < 0.001$) than that of controls (2.30 ± 0.91) and significantly lower levels of T_4 ($p < 0.001$) in the patients of metabolic syndrome (117.45) than in controls (134.64) while higher levels of T_3 , although statistically insignificant in the patients of metabolic syndrome.

Conclusion: Thyroid hormones up-regulate metabolic pathways relevant to resting energy expenditure, hence, obesity and thyroid functions are often correlated.

Obesity, a key component of metabolic syndrome, occurs due to increased energy intake, decreased energy expenditure, or a combination of both, thus leading to positive energy balance. Thyroid hormones up-regulate metabolic pathways relevant to resting energy expenditure, hence, obesity and thyroid functions are often correlated. On one hand, obesity per se causes alterations in thyroid hormones, i.e. increased thyroid hormone levels [1], increased TSH (Thyroid-

stimulating hormone) with no effect on T_3 (Triiodothyronine) and T_4 (thyroxine), [2] or increase in TSH and T_3 with no effect on T_4 , [3] on the other hand, subclinical hypothyroidism as a result of slow metabolism can lead to the obesity [4]. The mechanism of normal levels of T_3 , T_4 with increased TSH in metabolic syndrome is not defined, but it has been hypothesized that metabolic syndrome is associated with insulin resistance due to the defect in post receptor signal

* Corresponding author. Department of Medicine, King George's Medical College, Shah Mina Rd., Chowk, Lucknow, U.P 226003, India.
E-mail address: manish07gutch@gmail.com (M. Gutch).

Peer review under responsibility of Chang Gung University.

<http://dx.doi.org/10.1016/j.bj.2016.12.006>

2319-4170/© 2017 Chang Gung University. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

At a glance commentary

Scientific background on the subject

Obesity per se causes alterations in thyroid hormones, i.e. increased thyroid hormone levels, increased TSH with no effect on T_3 and T_4 , or increase in TSH and T_3 with no effect on T_4 ; on the other hand, subclinical hypothyroidism as a result of slow metabolism can lead to the obesity.

What this study adds to the field

The mechanism of normal levels of T_3 , T_4 with increased TSH in metabolic syndrome is not defined, but it has been hypothesized that metabolic syndrome is associated with insulin resistance due to the defect in post-receptor signal transduction in target tissue, a similar mechanism of thyroid receptor resistance might be operating in these obese persons.

transduction in target tissue; a similar mechanism of thyroid receptor resistance might be operating in these obese persons [2]. It is still not clear whether alterations in thyroid hormones are a cause or an effect of obesity (metabolic syndrome) suggesting need for further evaluation on a large scale with inclusion of various hormones elaborated by adipose tissue (like, leptin, resistin, adiponectin, etc). There are various studies on thyroid functions in patients with metabolic syndrome but there is a scarcity of studies on the issue from northern India.

Material and methods

Study design

The present study was conducted in the Department of Endocrinology and Metabolism, in tertiary care health center in northern part of India, it is a hospital based cross sectional case-control study, to study the correlation of thyroid function and serum lipid with metabolic syndrome.

Study population

Patients attending the outpatient department (OPD) of Endocrinology and Metabolism department were included in the present study ($n = 200$).

Inclusion criteria

1. Subjects who fulfilled the IDF (International Diabetic Federation) criteria for metabolic syndrome were grouped under cases.
2. Subjects who gave written informed consent.

Exclusion criteria

1. Subjects who are a known case of any psychiatric illness.
2. Patients suffering from any major medical or surgical illness.

Waist circumference		
Men	Women	Ethnicity
≥ 94 cm	≥ 80 cm	Europid, Sub-Saharan African, Eastern and Middle Eastern
≥ 90 cm	≥ 80 cm	South Asian, Chinese and ethnic South and Central American
≥ 85 cm	≥ 90 cm	Japanese

Two or more of the following:

Fasting triglycerides ≥ 150 mg/dL or specific medication.

HDL cholesterol < 40 mg/dL and < 50 mg/dL for men and women, respectively, or specific medication.

Blood pressure > 130 mm systolic or > 85 mm diastolic or previous diagnosis or specific medication.

Fasting plasma glucose ≥ 100 mg/dL or previously diagnosed Type 2 diabetes.

Fig. 1 IDF criteria for metabolic syndrome.

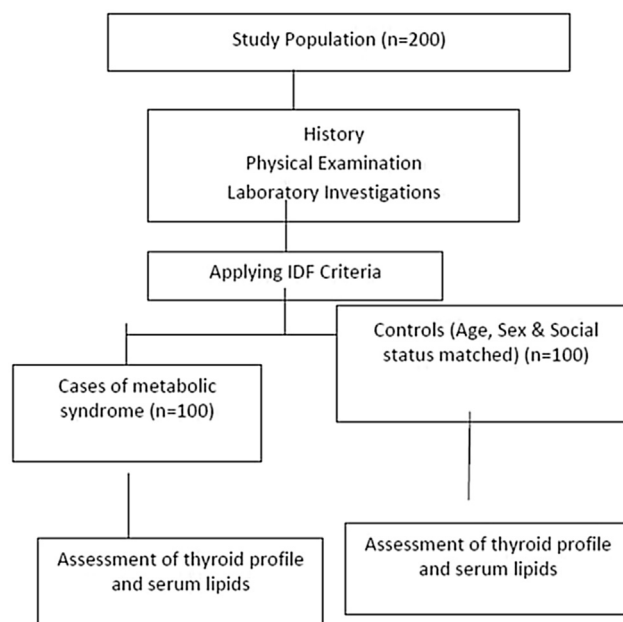


Fig. 2 Study protocol.

3. Patients on medications affecting thyroid profile and serum lipids.

IDF criteria for metabolic syndrome [5] [Fig. 1]

We chose to follow the IDF criteria over NCEP: ATP III (National Cholesterol Education Program Adult Treatment Panel III) because the IDF criteria takes into account the variation of ethnicity while ATP III is applicable mainly to the American population.

PROTOCOL of the study shown in Fig. 2

The first 100 patients attending OPD of department of Endocrinology and Metabolism, who were fitting in the IDF criteria for metabolic syndrome, were enrolled as cases after taking their consent for the study. Then, the same number of controls was included after matching their age, sex and social status with cases.

Download English Version:

<https://daneshyari.com/en/article/5524586>

Download Persian Version:

<https://daneshyari.com/article/5524586>

[Daneshyari.com](https://daneshyari.com)