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Original Research Article

A CLINICAL STUDY OF THYROID DYSFUNCTION IN OVERWEIGHT AND OBESE PATIENT-A HOSPITAL BASED STUDY

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Abstract

To find out thyroid hormone profile (Serum T3, T4, TSH level) in overweight and obese subjects of either sex and age. (18-60 yrs.)

This study was undertaken to find out relationship between thyroid function tests with overweight and obesity.

Methods: A cross sectional study was conducted in the Medicine Department of Jhalawar Medical College. Approximately overweight and obese patient of BMI >25 come in to OPD or emergency department & admitted in Jhalawar hospital. Total 100 subjects taken for study which fulfil the inclusion and exclusion criteria of study.

Results: In our study, Maximum 3 (50%) hypothyroid patient had extremely risk of obesity having BMI >40 and 4 (28.6%) patient having very high risk obesity BMI 35-40 and 6 (18.75%) patient having high risk BMI 30-35 and only 6 (12.5%) patient having BMI 25-30 overweight (low risk) patient.

Conclusion: This study concludes that obesity increases the risk of hypothyroidism, which is more common among, younger female than males. in this study some overweight and obese subject were found both clinically and biochemically hypothyroid and some subject are found only biochemically hypothyroid.

Introduction

The world health organization has labelled obesity a global epidemic, indeed a world health report 2016[1] estimated that 1.9 billion adult people age >18 yrs. worldwide were overweight and 650 million were obese. According to Who health report 2016, 39% of world adult population of age >18 yrs. were overweight and 13% were obese. In view of two most populous countries China and India, only 1% increase in the prevalence of obesity leads to 20 million additional cases. An expert consultation on obesity was convened by WHO[2] in Geneva from 3 to 5 June 1997 with the aim of reviewing current epidemiological information on obesity and drawing up recommendations for developing public health policies and programs for improving the prevention and management of obesity which is emerging as a global public health problem. Overweight women have higher value of serum triglyceride, high blood pressure, higher serum uric acid and high risk factor for ischaemic heart disease than normal weight women (. Noppa H., Bangtsson C, Bjorntrop P., Smith U., Tibblin E: Overweight in women- metabolic aspects. Acta Med Scond 1978; 203: 135-141)[3]

Obesity can result from hypothyroidism because of decrease caloric needs. However, only a minority of hypothyroid patients is truly obese, and even smaller proportion of obese patients is hypothyroid (Jemold M. olefsky et al 1994[4]). As the incidence and prevalence of obesity is increasing progressively in proportion to the sedentary life style and westernization in India. So we have decided to concentrate our work to reconsidered treatable causes i.e. subclinical hypothyroidism in obese persons.

Material and Methods

This study was cross sectional study conducting at Jhalawar medical college which was tertiary care hospital in south east Rajasthan. Approximately overweight and obese patient of BMI >25 come in to OPD or emergency department & admitted in Jhalawar hospital.

We were randomly selecting overweight and obese patient of BMI > 25 with age 18-60 year from outpatient as well as in patient department of general medicine in Jhalawar medical college. Total 100 subjects taken for study which fulfil the inclusion and exclusion criteria of study.

All overweight and obese patients were being selected randomly from outpatient and inpatient department of medicine. We were taking detailed history and thorough physical examination including anthropometry examination (height, weight) carried out for obesity and thyroid disorder by thyroid profile (T3, T4, TSH). Those patients who meet the inclusion and exclusion criteria were enrolled for the study. Inform consent was obtained from every patient enrolled for study before participation.

Inclusion Criteria:
All overweight and obese subjects in the age group of 18-60 year of either sex with their BMI > 25.

Exclusion Criteria:
-Subject age below 18 year and above 60 yr.
-Subject taking drugs that affect thyroid hormones (amiodarone, lithium, antithyroid drugs, iodine containing contrast media).
-Subject during pregnancy.

Result

In our study, total 100 overweight and obese subject whose BMI >25 were included. The following observation were recorded in our study.

There were 82 (82%) female and 18 (18%) male the maximum no. Of subject 88 (88%) were in the age range of 18-60 year. There were 24 (24%) subjects in age group of 18-30 year and 42(42%) subjects in age group of 31-40 years and 22 (22%) were in age group 41-50 year and only 12 (12%) were in age group of 51-60. year. (TABLE -1)

Table 1: (Age and Sex Profile)

Age Group(Year)	Sex		Total(%)
	Male (%)	Female (%)	
18-30	2	22	24
31-40	8	34	42
41-50	4	18	22
51-60	4	8	12
Total	18	82	100

Table 2: Relationship between Severity of Obesity And Hypothyroidism

Severity Of Obesity	Bmi(Kg/M^2)	Total No. Of Patient	No. Of Euthyroid	No. Of Hypothyroid	% Of Hypothyroid Patient
Low Risk (Overweight)	25-30	48	42	6	12.5
High Risk	30-35	S32	26	6	18.75
Very High Risk	35-40	14	10	4	28.6
Extreme High Risk	>40	6	3	3	50
Total		100	81	19	100

In our study, Maximum 3 (50%) hypothyroid patient had extremely risk of obesity having BMI >40 and 4 (28.6%) patient having very high risk obesity BMI 35-40 and 6 (18.75%) patient having high risk BMI 30-35 and only 6 (12.5%) patient having BMI 25-30 overweight (low risk) patient. (TABLE -2)

Table 3: Serum Thyroid Stimulating Hormone Level In Subject Studied

Groups	No. Of Patients	Mean+-S.D.	Statistical Significance
Euthyroid Patients	81	3+-0.82	P<0.001 (Significant Value)
Hypothyroid Patients	19	28.04+16.09µiu/Ml	

The level of serum T3 (0.7-2.15 ng/ml), serum T4 (52-127 ng/ml) and TSH (0.4-4.05 microIU/ml) were considered as normal range. Any patient who had value below and above this range was considered as abnormal and label as hypothyroidism and hyperthyroidism respectively According to thyroid profile.

The patient with normal range was considered as Euthyroid. Maximum number of patient (81%) had normal thyroid profile while a small percentage of patients (19%) had hypothyroidism. Out of them (12%) patient were both clinically and biochemically hypothyroid while (7%) were only biochemically (latent) hypothyroid. None of the patient had shown hyperthyroidism. (TABLE-3)

Discussion

In our study there were 18% male and 82% females. This female preponderance seems to be related to figure consciousness amongst them. Moreover in females higher prevalence of obesity has been observed in number of other studies also (build study 1979,[5] Abraham et al. 1980,[6] Black et al., 1983[7]). Craddock (1973)[8] from U.K. reported obesity to be 6 times more common in females as compared to males. The inequality of sex distribution in the present study could also be partly accountable to the random sampling and the peculiarity of the source from which the case material had been drawn. (Table-1)

The severity of obesity is classified according to B.M.I. The patients having BMI 25-30 kg/mt2 were classified as overweight (low risk) and BMI 30 -35 kg/mt2 were classified

as high risk obesity , while BMI between 35 to 40 considered as very high risk obesity. The patients who had BMI > 40 kg/mt2 having extreme high risk of obesity and considered as morbid obesity (Table 2).

In 81 euthyroid patients, TSH was in normal value (mean value 3+0.82). In 19 hypothyroid patients mean value was 37.04+22.09, Mean ec both group was also statistically significance (P< 0.001) [Table 3]

Conclusion

At present century, obesity is one of most prevalent metabolic disorder of people. So increase in overweight and obesity in our community have important impact on global incidence of cardiovascular disease, coronary artery disease, hypertension, type2 diabetes mellitus, obstructive sleep apnea, hyperlipidaemia, osteoarthritis etc. Obese patient have subclinical and clinical hypothyroidism occur sometimes. Then these hypothyroid patients have further lead to weight gain which result in increased body mass index and increase obesity. This will lead to increased incidence of obesity related metabolic disorder.

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