Original Article ISSN (O):2395-2822; ISSN (P):2395-2814

A Clinical Study on Obesity and Hypothyroidism and its Relation to Insulin Resistance.

Mohammad Elyas[1], Srinivas Y[2]

[1]Assistant Professor, Department of medicine, Fathima medical college Kadapa Telenagana.

[2] Assistant Professor, Department of medicine, Pinnamaneni Siddartha Medical College, Vijayawada.

Received: June 2017
Accepted: July2017

ABSTRACT

Background: Obesity may be defined as an abnormal growth of the adipose tissue due to an enlargement of fat cell size (Hypertrophic obesity) or increases in fat cell number (Hypertrophic obesity).[1] Body mass index, BMI is most widely used method to gauge obesity.[2] BMI is measured Wt/Ht2 in Kg/M2 (Weight/Height2). Aim: To access the hypothyroidism obesity and its relation with Insulin resistance. **Methods:** We examined 70 Females, The age group between 20 years and 50 years and whose body mass index is more than 30Kg/M2 and studied for 1 year i.e From 2015 Feb to 2016 Jan. Subjects who are on thyroid preparations Lithium, Amiodarone and Corticosteroid were excluded in this study blood samples were collected to assess fasting blood sugar, T_3,T_4,TSH , HOMAIR and fasting Insulin. **Result:** In 14 subjects only TSH is elevated. 24% were having subclinical Hypothyroidism. The mean age is 29.8±6.32 years Insulin resistance is seen in 38% subjects. Insulin resistance is seen in 21% of subjects whose thyroid function test are normal. **Conclusion:** Diabetes, hypertension, coronary artery disease is more common in obesity, So Thyroid profile and Insulin resistance has to be evaluated Insulin resistance is seen in 38% of subjects in our study.

Keywords: Obesity, Hypothyroidism, Subclinical Hypothyroidism, Dyslipidemia.

INTRODUCTION

Obesity may be defined as an abnormal growth of the adipose tissues due to an enlargement of fat cell size(Hypertrophic obesity) or increase in fat cell number (Hypertrophic obesity) Body mass index >30 is most commonly used as threshold for obesity in men and women. Obesity has become major public health problem in developed and developing countries.

In obese patients with type 2 diabetes the association of hyperglycemia, hyperinsulinemia, dyslipidemia and hypertension which leads to carnary artery disease and stroke may result from genetic defect producing insuin resistance.

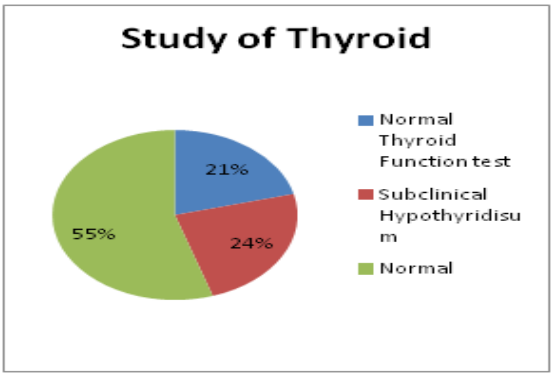
Thyroid disease is very common in females. Hypothyroidism one of the important cause of obesity. It is 4-6 times common than males. It is associated with infertility in females and dyslipidemia coronary artery disease and pericardial effusion.[2] Subclinical hypothyroidism and overt Hypothyroidism are important risk factors for Insulin resistance.[4-5]

Different studies have shown the association between Hypothyroidism, obesity and Insulin resistance and metabolic syndrome is usually precede development of type 2 Diabetes mellitus. Type 2 Diabetes is associated with increased plasma insulin concentration hyperinsulinemia. This compensatory response by pancreatic beta cell occurs due to decreased sensitivity of target tissues to insulin.[8]

Name & Address of Corresponding Author
Dr. Srinivas Y
Assistant Professor, Department of medicine, Pinnamaneni siddartha medical college,
Vijayawada.

Table 1:

Total No of subjects	Normal Thyroid Factors	Subclinical Hypothyroidism	Normal
60	30(21%)	14(24%)	55%



A part from obesity other causes of Insulin resistance are excess growth hormone. Excesses glucocorticoids, Polycystic Ovarian disease, and Mutation of Insulin receptor.[9] Bakker et al Chubb

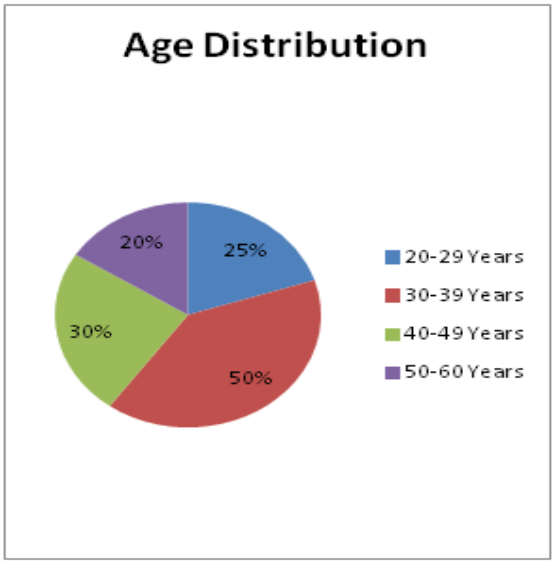
et al Evaluated Insulin resistance augments the effect of hypothyroidism on lipids and explained the mechanism between the thyroid function and insulin resistance in diabetic dyslipidemia.[11,12]

MATERIALS AND METHODS

In our study 60 Female subjects were selected who BMI is more than 30 Kg/M2 with the age group 20-60 years. Subjects with known diseases of endocrine system and who are on drugs like Lithium, Amiodarone, Corticosteroids and thyroid hormone preparations after through clinical examination blood samples were collected after overnight fasting of more than eight hours. Fasting blood glucose, fasting insulin level were estimated by radio immunoassary (RIA) Method. HOMA-IR(14) was used to evaluate insulin resistance (Fasting Serum) Insulin (µu/ml) fasting plasma glucose (mmol/L/22.5). And T3T4TSH were also estimated. Subclinical hypothyroidism is defined as normal T4 and T3 and TSH is > 4.5µIU/L.

Table 2:

Age	Percentage
20-29 Years	15-25%
30-39 Years	30-50%
40-49 Years	17-30%
50-60 Years	13-20%



RESULTS

70 subjects were including in this study. 29.8±6.32 is mean age of participants. Subclinical hypothyroidism is seen in 24% i.e 14 subjects. Insulin resistance is seen in 38% subjects 21% subjects are having insulin resistance in whom T3T4TSH were normal. Insulin resistance is estimated by HOMAIR. P.value = 0.6 and odds ratio is 0.668 with 94% confidence interval exuding from 0.18 to 2.07

Table 3:

Base on TSH	Subclinical	Normal	P value
TSH µIU/L	>4.5	<4.5	p>0.05ns
No	1(24%)	46	-
Age(Years)	30.12 ± 5.4	28.30 ± 8.13	Ns
HOMAIN	6/13(42%)	9/37 23%	Ns

DISCUSSION

It has been proposed that insulin resistance predisposes to hyperglycaemia, which results in hyperinsulinemia and this excessive insulin levels then contributes to high level of triglycerides and increased sodium retention by revel tubules, thus including hypertension. High level of insulin can stimulate enolothelial proliferation to initiate atheroselesosis .

Insulin resistance is most important feature of type 2 diabetes mellitus. Decreased ability of action of insulin on target tissues especially on muscle and liver it results from combination of genetic susceptibility and obesity.[15] The metabolic syndrome or syndrome, The insulin resistance syndrome are terms used to includes insulin resistance , hypertension dyslipidemia (low HDL and High triglycerides) central obesity type 2 diabetes and accelerated cardiovascular disease. Study conducted by M.Sigh et al shows complex inter play between thyroid hormonal status and insulin levels in the pathogenesis of insulin resistance.

We found the potential linkage between insulin resistance and thyroid hypofunction is obese females the study conducted by Hafey et al shows pcos women associated with high BMI suggest obesity may present a link between IR and thyroid hypofunction is women. 2 different syndromes of server insulin resistance have been described 1 Type A effects young women and characterized by severe hyperinsuleamenia obesity and features of hyperandrogenisum.

2 Type B effects middle aged women characterized by severe hyperinsuleamenia, hyperandrogenisum and auto immune disorders.

CONCLUSION

In women Thyroid dysfunction is usually associated with obesity and insulin resistance. So evaluation should be done in patients with Hypothyroidism, Obesity, regarding Insulin resistance.

REFERENCES

1. Hager. A. (1981) Br. Med. Bull. 37(3) 287.
2. Harrison's Principles of internals medicine 19th Edi.
3. Harrison's Principles of internals medicine 19th Edi.
4. David Son's Principles of medicine 22nd Edi.
5. Guyton and Hall - text of Human Physiology.

6. Harrison's Principles of internals medicine – 19th Edi.
7. Meier C, Staub 33, Roth C-B, Guglielmetti M, Kunz M, Miserez AR, Drewe 3, Huber P, Herzog R, der B. TSH-controlled L-thyroxine therapy reduces cholesterol levels and clinical symptoms in subdinical hypothyroidism: a double blind, placebo-controlled trial (Basel Thyroid Study). J Clip Endocrinol Metab 2001; 86: 4860-66.
8. Setter R, Dernirbas B, Culha C, Cakal E. The effect of L-thyroxine replacement therapy on based cardiovascular risk in sub clinical hypothyroidism. Invest J Endocrinol 2004; 27: 897-903.
9. American Association of Clinical Endocrinologists medical guidelines for clinical practice for the evaluation and treatment of hyperthyroidism and hypothyroidism. Endocr Pract 2002; 8: 457-69.
10. Garduno-Garcia 3, Alvirde-Garcia U, Lopez-Carrasco G, Padilla Mendoza ME, Mehta R, et al. (2010) TSH and free thyroxine concentrations are associated with differing metabolic markers in euthyroid subjects. Eur J Endocrinol 163: 273-278.
11. Kumar HK, Yadav RK, Prajapati J, Reddy CV, Raghunath M, et al. (2009) Association between thyroid hormones, insulin resistance, and metabolic syndrome. Saudi Med 3 30: 907-911.
12. Fommei E, Iervasi G. The role of thyroid hormone in blood pressure homeostasis: evidence from short-term hypothyroidism in humans. 3 Clin Endocrinol Metab 2002; 87: 1996-2000.
13. Bakker et al (11)
14. Chubb et al (12)
15. Maratou E, Hadjidakis D, Kollias A, Tsegka K, Peppa M, Aleyizaki M, et al. Studies of insuilr, resistance in patients with clinical and subdinical hypothyroidism. Eur J Endocrinol 2009
16. Reavert GM. Banting lecture. Role of insulin resistance in human disease. Diabetes 1988T 37: 1595-607.
17. Bakker 531, Ter Maaten JC, Popp-Snijders C, Slaets JPJ, Heine R31 Gans ROB. The relationship between thyrotropin and low density lipoprotein cholesterol is modified by insulin sensitivity in healthy euthyroid subjects. J Clin Endocrinol Metab 2001; 86: 1206-11.

How to cite this article: Elyas M, Srinivas Y. A Clinical Study on Obesity and Hypothyroidism and its Relation to Insulin Resistance. Ann. Int. Med. Den. Res. 2017; 3(4):ME59-ME61.

Source of Support: Nil, **Conflict of Interest:** None declared