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CO-RELATION BETWEEN METABOLIC SYNDROME AND HYPOTHYROIDISM, PATIENTS ATTAINING GENERAL MEDICINE OPD

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Conflicts of Interest: Nil

ABSTRACT:

Introduction: Metabolic syndrome (MetS) and hypothyroidism is well-established which is associated with increased risk atherogenic cardiovascular disease. All over the world the prevalence of metabolic syndrome is increasing with evidence of high prevalence in India and other South Asian countries. Metabolic syndrome is define as a group of abnormalities including hypertension, insulin resistance, hyperglycemia, abdominal obesity, increased triglycerides, and decreased high-density lipoprotein cholesterol (HDL-C). Independent Risk factors for cardiovascular diseases (CVD) are both metabolic syndrome and hypothyroidism. Overlap Presence of both conditions may occur in the pathogenic mechanisms of atherosclerotic cardiovascular disease by metabolic syndrome and hypothyroidism. There are many studies which showed that higher TSH (thyroid stimulating hormone) concentrations are related with increased incidence the occurrence of metabolic syndrome. Thyroid dysfunction has been related with atherosclerotic cardiovascular disease. Though, metabolic syndrome and thyroid dysfunction are independent risk factors of atherosclerotic cardiovascular disease. They also showed that insulin resistant is more susceptible to the increased levels of high LDL-C at increasing TSH levels even within the normal range.

Aim: The main aim of the study is to study thyroid dysfunction in metabolic syndrome.

Material and methods: Total 150 patients were included in this study. Patients with more than 12 year of age were presenting with metabolic syndrome as per IDF criteria. Based on modified Asian NCEP-ATP III panel criteria metabolic syndrome was diagnosed. In all the patients detailed physical examination was done as well as detailed clinical history was noted in each patient and also height, weight, waist circumference and blood pressure was taken. Routine Investigation like blood glucose, triglycerides, high density lipoprotein (HDL) cholesterol, free triiodothyronine (T3), free thyroxine (T4) and thyroid stimulating hormone (TSH) were done on the day of presentation.

Result: Total 150 patients were included in this study. Patients with more than 12 year of age were presenting with metabolic syndrome as per IDF criteria. of these 150 patients, 91 were males and 59 were females. The numbers of male patients were more (60.7%) as compared to females (39.3%). Out of the 91 male patients 42 patients belong to age group 30-40, 70 patients belong to age group 41-50 as well as 54 patients belong to age group 51-60 whereas in female 27 patients belong to age group 30-40, 43 patients belong to age group 41-50 and 64 patients belong to age group 51-60.

Conclusion: In conclusion, prevalence of thyroid dysfunction is seen in 54% of the patients with metabolic syndrome studied. Subclinical hypothyroidism was more common as compared to other thyroid dysfunction. Thyroid function is associated with certain components of metabolic syndrome

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(waist circumference and HDL cholesterol). Subclinical hypothyroidism one must have a strong suspicion with metabolic syndrome, as the incidence is high in them.

Keywords: Metabolic syndrome, hypothyroid, Thyroid function, Subclinical hypothyroidism

Introduction

Metabolic syndrome (MetS) and hypothyroidism is well-established which is associated with increased risk atherogenic cardiovascular disease[i]. Metabolic syndrome represent cluster of risk factors characterized by atherogenic dyslipidemia, hypertension, hyperglycemia, prothrombotic and proinflammatory conditions[ii]. All over the world the prevalence of metabolic syndrome is increasing with evidence of high prevalence in India and other South Asian countries[iii]. Metabolic syndrome is define as a group of abnormalities including hypertension, insulin resistance, hyperglycemia, abdominal obesity, increased triglycerides, and decreased high-density lipoprotein cholesterol (HDL-C)[iv].

There are many studies which showed that higher TSH (thyroid stimulating hormone) concentrations are related with increased incidence the occurrence of metabolic syndrome. Thyroid dysfunction has been related with atherosclerotic cardiovascular disease. Though, metabolic syndrome and thyroid dysfunction are independent risk factors of atherosclerotic cardiovascular disease. They also showed that insulin resistant is more susceptible to the increased levels of high LDL-C at increasing TSH levels even within the normal range[v].

Independent Risk factors for cardiovascular diseases (CVD) are both metabolic syndrome and hypothyroidism. Overlap Presence of both conditions may occur in the pathogenic mechanisms of atherosclerotic cardiovascular disease by metabolic syndrome and hypothyroidism[vi]. As the study done by Bauer DC et al showed among older women with the increase in TSH level that related to deleterious changes in serum lipids. Women with multiple lipid abnormalities were double as likely to have increased TSH level[vii]. The main aim of the study is to study thyroid dysfunction in metabolic syndrome.

MATERIAL AND METHODS:

This is study conducted in Department of General Medicine of Lokmanya Group of Hospitals Chinchwad Nigadi Pune India during 1 year. Total 150 patients were included in this study. Patients with more than 12 year of age were presenting with metabolic syndrome as per IDF criteria. Based on modified Asian NCEP-ATP III panel criteria metabolic syndrome was diagnosed[viii]. Patients with receiving medication which may alter thyroid functions or lipid levels in pregnant women and patients with used corticosteroid, active liver disease, cardiovascular disease and renal dysfunction were excluded in this study. In all the patients detailed physical examination was done as well as detailed clinical history was noted in each patient and also height, weight, waist circumference and blood pressure was taken. Routine Investigation like blood glucose, triglycerides, high density lipoprotein (HDL) cholesterol, free triiodothyronine (T3), free thyroxine (T4) and thyroid stimulating hormone (TSH) were done on the day of presentation. The diagnoses made in each patient were recorded in separate proforma for data as the criteria mention below:

TGL (Triglycerides) - more than 150 mg/dl
HDL (High Density Cholesterol) - less than 40 mg/dl in men, 50 mg/dl in women
BP (Blood pressure) - Systolic more than 130 mm of Hg. Diastolic more than 85 mm of Hg
FBS (Fasting Blood Sugar) - more than 100 mg/dl
By Chemiluminescent Immunoassay (CLIA) method Thyroid function tests were done.

OBSERVATIONS AND RESULT:

Total 150 patients were included in this study. Patients with more than 12 year of age were presenting with metabolic syndrome as per IDF criteria. Of these 150 patients, 91 were males and 59 were females as shown in table below. The numbers of male patients were more (60.7%) as compared to females (39.3%). Out of the 91 male patients 42 patients belong to age group 30-40, 70

patients belong to age group 41-50 as well as 54 patients belong to age group 51-60 whereas in female 27 patients belong to age group 30-40, 43 patients belong to age group 41-50 and 64 patients belong to age group 51-60.

Table 1: Prevalence and spectrum of thyroid dysfunction showing with gender.

	Male	Percentage	Female	Percentage	Total	Percentage
Subclinical hypothyroidism	45	49.5	31	52.5	76	50.7
Hypothyroidism	16	17.6	14	23.7	30	20.0
Subclinical hyperthyroidism	3	3.3	1	1.7	4	2.7
Hyperthyroidism	1	1.1	0	0.0	1	0.7
Euthyroidism	26	28.6	13	22.0	39	26.0
Total	91	100.0	59	100.0	150	100.0

Out of the150 patients with metabolic syndrome, 47% had abnormal thyroid function tests. Subclinical hypothyroidism was the most common amongst, 50.7% and 20% of the study population had hypothyroidism, while subclinical hyperthyroidism was seen in only 4 patients (2.7%) and one patient had hyperthyroidism (0.7%) as shown in above table on 1.

Table 2: Prevalence of metabolic syndrome among the spectrum of thyroid dysfunction

		%
Euthyroid	21 of 48 euthyroid patients had metabolic syndrome	43%
Hypothyroid	5 of 24 hyperthyroid patients had metabolic syndrome	20%
Hyperthyroid	6 of 28 patients with hypothyroidism had metabolic syndrome	21%

On comparing, individual variables of metabolic syndrome with respect to thyroid values which shows that systolic blood pressure is high with hypothyroidism whereas subclinical hypothyroidism and euthyroid group shows almost similar. diastolic blood pressure is high in both hypothyroid and subclinical Hypothyroidism as compare to euthyroid group having mean diastolic BP of 82 mm of Hg. Triglycerides values also shows high in hypothyroid group, mean value of 90 (SD - 49) whereas 39 in the euthyroid group and 76 in the subclinical hypothyroidism.

DISCUSSION:

Metabolic syndrome is collection of risk factors for the development of cardiovascular disease. There are many studies in past which shows higher incidences of association of thyroid dysfunction (subclinical hypothyroidism) with metabolic syndrome[ix], [x]. According to the study of Sat Byul Park et al[xi] which is done in Korean population considered 594 patients with metabolic syndrome. 41% of patients had thyroid dysfunction in which Of 594 patients, 158 had subclinical hypothyroidism, 49 patients had subclinical hyperthyroidism and hypothyroidism in 38 patients which is little bit less as compared to this study.

Studied done by Chih Cheng Lai et al[xii] which shows that prevalence of subclinical hypothyroidism and metabolic syndrome was 32% subjects with subclinical hypothyroidism had metabolic syndrome and 28% of patients with subclinical hyperthyroidism which is similar to this study. The prevalence of metabolic variable in metabolic syndrome and associated thyroid dysfunction which is almost similar to present study which is done by Punia et al[xiii]; Of the 360 patients included in the study 62% had high TGL values, and 83 % had a low HDL. Similar studies which are done by Jayakumar et al[xiv] and Gaurav et al[xv] shows that thyroid status in metabolic syndrome included 120 patients. Of which 72 patients had low HDL (60% of study group) and 67 had high triglycerides - 56 % of the study group as well as in south Indian women with metabolic syndrome showed that 75% of

them had high FBS and 63% had high blood pressure.

Gyawali et al[3] studied prevalence of thyroid dysfunction in patients with metabolic syndrome in which thyroid dysfunction was 31.25% (40), 28.90% (37) had subclinical hypothyroidism, 1.55% (2) had overt hyperthyroidism, 0.80% (1) had subclinical hyperthyroidism and 68.75% (88) were euthyroid.

CONCLUSION:

In conclusion, prevalence of thyroid dysfunction is seen in 54% of the patients with metabolic syndrome studied. Subclinical hypothyroidism was more common as compared to other thyroid dysfunction. Thyroid function is associated with certain components of metabolic syndrome (waist circumference and HDL cholesterol). Subclinical hypothyroidism one must have a strong suspicion with metabolic syndrome, as the incidence is high in them.

REFERENCES:

1. Eckel RH, Grundy SM, Zimmet PZ. The metabolic syndrome. Lancet 2005;365:1415-28.
2. Shantha GP, Kumar AA, Jeyachandran V, Rajamanickam D, Rajkumar K, Salim S, et al. Association between primary hypothyroidism and metabolic syndrome and the role of C reactive protein: a cross-sectional study from South India. Thyroid Res. 2009;2(1):2. doi:10.1186/1756-6614-2-2.
3. Gyawali P, Takanche JS, Shrestha RK, Bhattarai P, Khanal K, Risal P, et al. Pattern of thyroid dysfunction in patients with metabolic syndrome and its relationship with components of metabolic syndrome. Diabetes Metab J. 2015;39(1):66–73
4. Grundy SM. Hypertriglyceridemia, insulin resistance, and the metabolic syndrome. Am J Cardiol. 1999;83:25F-9F.
5. Bakker SJ, Maaten JC, Popp Snijders C, Slaets JP, Heune RJ, Gans RO. The relationship between thyrotropin and low-density lipoprotein cholesterol is modified by insulin sensitivity in healthy euthyroid subjects. J Clin Endocriol Metabol. 2001; 86:1206-11.
6. Kota SK, Meher LK, Krishna S, Modi K. Hypothyroidism in metabolic syndrome. Indian J Endocrinol Metab. 2012;16 Suppl 2:S332–3.
7. Bauer DC, Ettinger B, Browner WS. Thyroid functions and serum lipids in older women: a population-based study. Am J Med. 1998;104(6):546-51
8. Misra A, Khurana L. The metabolic syndrome in South Asians: epidemiology, determinants, and prevention. Metab Syndr Relat Disord. 2009;7:497–514.
9. Ruhla S, Weickert MO, Arafat AM, Osterhoff M, Isken F, Spranger J, et al. A high normal TSH is associated with metabolic syndrome. Clin Endocrinol. (Oxf). 2010 May;72(5):696-701.
10. Park Ht, Cho GJ, Ahn KH, Shin JH, Hong SC, Kim T, et al. Thyroid stimulating hormone is associated with metabolic syndrome in euthyroid postmenopausal women. Maturitas. 2009 Mar; 62(3):301-5.
11. Sat Byul Park, Ho Chun Choi, Nam Seok Joo. The relation of thyroid function to components of the metabolic syndrome in Korean men and women. J Korean Med Sci. 2011 April;26(4):540-5.
12. Chih-Cheng Lai, Sai-Hung Tang, Dee Pei, ChengYi Wang, Yen-Lin Chen, Chung-Ze Wu, et al. The prevalence of subclinical thyroid dysfunction and its association with metabolic syndrome in Taiwanese elderly. Int J Gerontol. 2011 Mar;5(1):25-9.
13. Punia VPS. Study of metabolic syndrome and associated thyroid dysfunction in an urban population. JIACM. 2010;11(3):184-6.
14. Jayakumar RV. Hypothyroidism and metabolic syndrome. Thyroid Res Pract. 2013;10:1-2.
15. Gaurav Agarwal, Sudhakar MK, Mohini Singh, Senthil N, Amarabalan Rajendran. The prevalence of thyroid dysfunction among South Indian women with metabolic syndrome. J Clin Diagn Res. 2011 Apr;5(2):213-6.