



## STUDY OF THYROID DYSFUNCTION IN METABOLIC SYNDROME

## General Medicine

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## ABSTRACT

**Introduction** - Patients with metabolic syndrome have many symptoms and signs suggestive of thyroid dysfunction. It is very difficult to exclude the diagnosis of hypothyroidism on clinical grounds. So this study was conducted in metabolic syndrome patients to study the prevalence and types of thyroid dysfunction. **Material and Method:** Based on IDF criteria for Metabolic Syndrome, 120 newly detected metabolic syndrome patients attending the out patient Department in Medicine J.L.N Medical College and Hospital, Ajmer were studied, after taking consent. A detailed history and clinical examination were done. Investigations including metabolic syndrome criteria parameters and serum free T4, TSH were done. **Results:** According to thyroid function test results, 98 patients found to have euthyroid and 4 patients were hypothyroid. 18 patients had subclinical hypothyroidism. No one in this study had either subclinical or overt hyperthyroidism. The thyroid dysfunction is 18.33% prevalent in metabolic syndrome patients. Among the thyroid dysfunction, subclinical hypothyroidism is highly prevalent—15.0%. The overt hypothyroidism is 3.3% prevalent in metabolic syndrome patients. Thyroid dysfunction is much more prevalent in women with metabolic syndrome than men. 18(40%) out of 70 women had thyroid dysfunction (2 hypothyroid and 16 subclinical hypothyroid). 4(8%) out of 50 men had thyroid dysfunction (2 hypothyroid and 2 subclinical hypothyroid). **Conclusion:** This study emphasis to exclude the presence of Thyroid dysfunction while managing metabolic syndrome patients.

## KEYWORDS

Thyroid dysfunction, Metabolic Syndrome, Subclinical hypothyroidism

## INTRODUCTION

Metabolic syndrome is defined as a set of risk factors that includes resistance to insulin, dyslipidemia, abdominal obesity and high blood pressure, and increases the risk of cardiovascular diseases and diabetes.<sup>(1)</sup> The main drivers are related to rapid nutritional changes, lifestyle and socioeconomic transitions, consequent to increasing affluence, urbanization, mechanization and rural-to-urban migration.<sup>(2)</sup> Both Metabolic syndrome and thyroid dysfunction are associated with increased risk of atherosclerotic heart disease. Little is known about the relationship between metabolic syndrome and thyroid dysfunction. Only a few small studies have been performed.<sup>(3,4)</sup> So a study was conducted in metabolic syndrome patients to study the prevalence and types of thyroid dysfunction.

## MATERIAL AND METHOD

Based on IDF criteria for Metabolic Syndrome, 120 newly detected metabolic syndrome patients attending the out patient Department in Medicine J.L.N Medical College and Hospital, Ajmer were studied from October 2018 to April 2020, after taking consent. A detailed history and clinical examination were done. Investigations including metabolic syndrome criteria parameters and serum free T4, TSH were done.

## SELECTION OF STUDY SUBJECTS:

The patients who fulfilled the criteria for metabolic syndrome by IDF was taken into the study.

## For a person to be defined as having the metabolic syndrome they must have:

1. Central obesity – waist circumference  $\geq 90$  cm for men and  $\geq 80$  cm for women.

## Plus any two of the following four factors:

1. Raised TG level  $\geq 150$  mgs/dl or any specific treatment.
2. Reduced HDL cholesterol  $< 40$  mg/dl in males and  $< 50$  mg/dl in females.
3. Raised blood pressure  $\geq 130/85$  mm Hg or medication.
4. Raised fasting glucose  $\geq 100$  mg/dl or previously diagnosed type 2 diabetes

## EXCLUSION CRITERIA

1. Known cases or on treatment for thyroid dysfunction.

2. Patients with chronic illness.
3. Taking Steroids
4. Severely ill patients
5. Pregnant Women
6. Individuals above 30 Yrs.

## RESULT

According to thyroid function test results, 98 patients found to have euthyroid and 4 patients were hypothyroid. 18 patients had subclinical hypothyroidism. No one in this study had either subclinical or overt hyperthyroidism.

The thyroid dysfunction is 18.33% prevalent in metabolic syndrome patients. Among the thyroid dysfunction, subclinical hypothyroidism is highly prevalent 15.0%. The overt hypothyroidism is 3.3% prevalent in metabolic syndrome patients.

Thyroid dysfunction is much more prevalent in women with metabolic syndrome than men. 18(40%) out of 70 women had thyroid dysfunction (2 hypothyroid and 16 subclinical hypothyroid). 4(8%) out of 50 men had thyroid dysfunction (2 hypothyroid and 2 subclinical hypothyroid).

Table 1: Shows Distribution Thyroid Parameters

	N	Minimum	Maximum	Mean	Standard Deviation
FT4	120	0.17	2.27	1.07	0.265
TSH	120	0.56	154	5.4	19.809
Valid N (list wise)	120				

Table 2: Cross Table Thyroid Status With Respect Sex Distribution

Thyroid status		SEX		
		Male	Female	Total
Euthyroid	Count	46	52	98
	% within SEX	92.00%	74.30%	81.70%
Subclinical Hypothyroid	Count	2	16	18
	% within SEX	4.00%	22.90%	15.00%
Hypothyroid	Count	2	2	4
	% within SEX	4.00%	2.90%	3.30%
Total	Count	50	70	120
	% within SEX	100.00%	100.00%	100.00%

**Table 3. Shows Age Wise Thyroid Dysfunction**

AGE	TOTAL NO	Euthyroid	Hypothyroid	Subclinical Hypothyroid	Subclinical Hyperthyroid
<35	14	12	2	0	0
36-45	48	36	0	12	0
46-55	38	32	2	4	0
>55	20	18	0	2	0

**DISCUSSION**

The metabolic syndrome is a cluster of metabolic abnormalities where in people are obese and have hypertension, high triglyceride level, low high density lipoprotein cholesterol and abnormal fasting glucose levels.(5) People with metabolic syndrome are at high risk for developing cardiovascular disease and type-2 diabetes. Hypothyroidism is associated with lipid abnormalities like high triglycerides and low high density lipoproteins, weight gain, glucose intolerance and hypertension. Thus hypothyroidism mimics the parameters of metabolic syndrome.

In this study, thyroid dysfunction prevalence is 18.30% among metabolic syndrome patients. Subclinical Hypothyroidism is 15% prevalent in metabolic syndrome patients and Overt Hypothyroidism is 3.3% prevalent. There is no incidence of either overt or subclinical Hyperthyroidism in this study population. The prevalence of thyroid dysfunction and hypothyroidism in metabolic syndrome patients are higher than the prevalence in normal population, which is 5.9% for thyroid dysfunction and 4.6% for hypothyroidism (0.3% overt and 4.3% subclinical hypothyroidism)<sup>(6)</sup>. This study is consistent with study done by Uzunulu et al, as 16.4% of metabolic syndrome patients had hypothyroidism in Japan. Study by Baral et al.7, Khatiwada et al.8 have reported higher rate of thyroid disorders in eastern Nepal.

**CONCLUSIONS**

This study emphasizes to exclude the presence of Thyroid dysfunction while managing metabolic syndrome patients. This will also reduce the risk of cardiovascular disease in metabolic syndrome patients.

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