

A STUDY ON CORRELATION OF THYROID PROFILE WITH THE COMPONENTS OF METABOLIC SYNDROME

Jenish Babu A ^{1*}, Suresh M K ², Premkumar⁴, Mohandhas ³

1. Junior Resident, , Department of General Medicine Sree Mookambika Institute of Medical Sciences College Kanyakumari, Tamil Nadu, India.

2. Professor, Department of General Medicine, Sree Mookambika Institute of Medical Sciences Kanyakumari, Tamil Nadu, India.

3. Associate professor, Department of General Medicine Sree Mookambika Institute of Medical Sciences College Kanyakumari, Tamil Nadu, India

4. Junior Resident, , Department of General Medicine Sree Mookambika Institute of Medical Sciences College Kanyakumari, Tamil Nadu, India

Corresponding Author: Dr. Jenish Babu Postgraduate Student, Department of General Medicine Sree Mookambika Institute of Medical Sciences College Kanyakumari, Tamil Nadu, India

ABSTRACT

Background. Metabolic syndrome has affected more than 25% of the population in the western civilisations. Metabolic syndrome is a major determining factor for the early onset of insulin resistant diabetes & accelerated atherosclerosis.

Methods: Data was collected from diabetic patients attending Department of General medicine of Sree Mookambika Institute of Medical Sciences, Kanyakumari, Tamil Nadu from March 2022 to September 2023. All 100 patients were explained in detail about the procedure and informed consent was obtained.

Results: Out of the 18 women with both MetS & SCH (Metabolic syndrome & Sub-clinical hypothyroidism), 9 had a DBP value more than 85 mm of Hg. Out of the 3 men with both MetS & SCH, 1 had DBP value more than 85 mm of Hg. The increase in DBP is due to increased arterial stiffness in both MetS and SCH.

Conclusion: Patients diagnosed to have a double jeopardy, of MetS with SCH, should be intensively treated, with life-style interventions and if needed, with pharmacological therapy, to achieve the desired therapeutic targets.

Keywords: Metabolic syndrome & Sub-clinical hypothyroidism

INTRODUCTION:

Metabolic syndrome has affected more than 25% of the population in the western civilisations. Metabolic syndrome is a major determining factor for the early onset of insulin resistant diabetes & accelerated atherosclerosis. Metabolic syndrome is clinically a conglomeration of risk factors highlighted by the presence of systemic hypertension, altered lipid profile, dysglycemia, proinflammatory & prothrombotic states. Sub-clinical hypothyroidism

& Metabolic syndrome (SCH & MetS) are well established risk factors for atheromatous-occlusive vascular diseases, dyslipidemia, low grade persistent inflammatory state and pro-coagulable state. This association may be in part explained by thyroid hormone's regulatory effect on lipid metabolism and blood pressure.^{1_5}

Metabolic syndrome and sub-clinical/overt thyroid dysfunction are independent risk factors, in the genesis of cardiovascular diseases. Hence, it is plausible that persons affected with both these conditions, could have more than additive hazard.

This study is a step towards ascertaining the possible positive link of thyroid dysfunction with the components of metabolic syndrome.⁶

In this study, TSH has been used as the prime indicator of thyroid dysfunction, as it increases before the elevation of FT4 and also before clinical manifestation.^{7_10}

OBJECTIVE:

MATERIALS AND METHODOLOGY:

Data was collected from diabetic patients attending Department of General medicine of Sree Mookambika Institute of Medical Sciences, Kanyakumari, TamilNadu from March 2022 to September 2023. All 100 patients were explained in detail about the procedure and informed consent was obtained.

Inclusion Criteria:

Patients fulfilling the criteria for metabolic syndrome by International diabetic foundation were taken into study. Patients with metabolic syndrome not on any medications – newly detected metabolic syndrome patients. Exclusion Criteria: Known patients of hypothyroid or sub-clinical hypothyroid or hyperthyroidism. Patients on medications for diabetes mellitus, hypertension, thyroid disorders and dyslipidemia. Patients on steroids.

The purpose of the study was explained to the patient and informed consent was obtained. Data was collected using a pretested proforma meeting the objectives of the study. Detailed history and necessary investigations were undertaken. Patients were selected for study who satisfied all the inclusion and exclusion criteria. Patients were diagnosed having metabolic syndrome by the,

Central obesity – defined as waist circumference with ethnicity specific values (for south Asians: ≥ 90 cm for Men and ≥ 80 cm for women were used) and any two of the following: Raised triglycerides: > 150 mg/dl (1.7 mmol/L), or specific treatment for this lipid abnormality. Reduced HDL cholesterol: < 40 mg/dl in males, < 50 mg/dl in females, or specific treatment for this lipid abnormality. Raised blood pressure: systolic BP > 130 (or) diastolic BP 85 mm Hg, or on treatment for previously diagnosed hypertension. Raised fasting plasma glucose (FPG) > 100 mg/dl, or previously diagnosed type 2 diabetes mellitus. All the patients enrolled for the study, were subjected to Thyroid Function Test. Test results were entered in an excel sheet.

Meticulous analysis of the data was carried and calculated parameter entered in the Microsoft office EXCEL 2019.

RESULTS:

Comparing thyroid function with MetS components:

Waist circumference:

	Men WC (cm)	Women WC(cm)
MetS with SCH	100.3	93.6
MetS with euthyroid	95.5	87.5

Waist circumference is the essential criteria for diagnosing metabolic syndrome. Both men and women with MetS, have higher WC, compared to their euthyroid counter-parts. But, this difference is subtle, with a p -value >0.05 , statistically insignificant. Waist circumference is the indirect measure of visceral adiposity. This has been also found to be associated with the incidence of, fatty liver and NAFLD.

Though there is a significant arithmetic difference in the waist circumference between both the groups, the p -value is >0.05 , conferring no statistical significance.

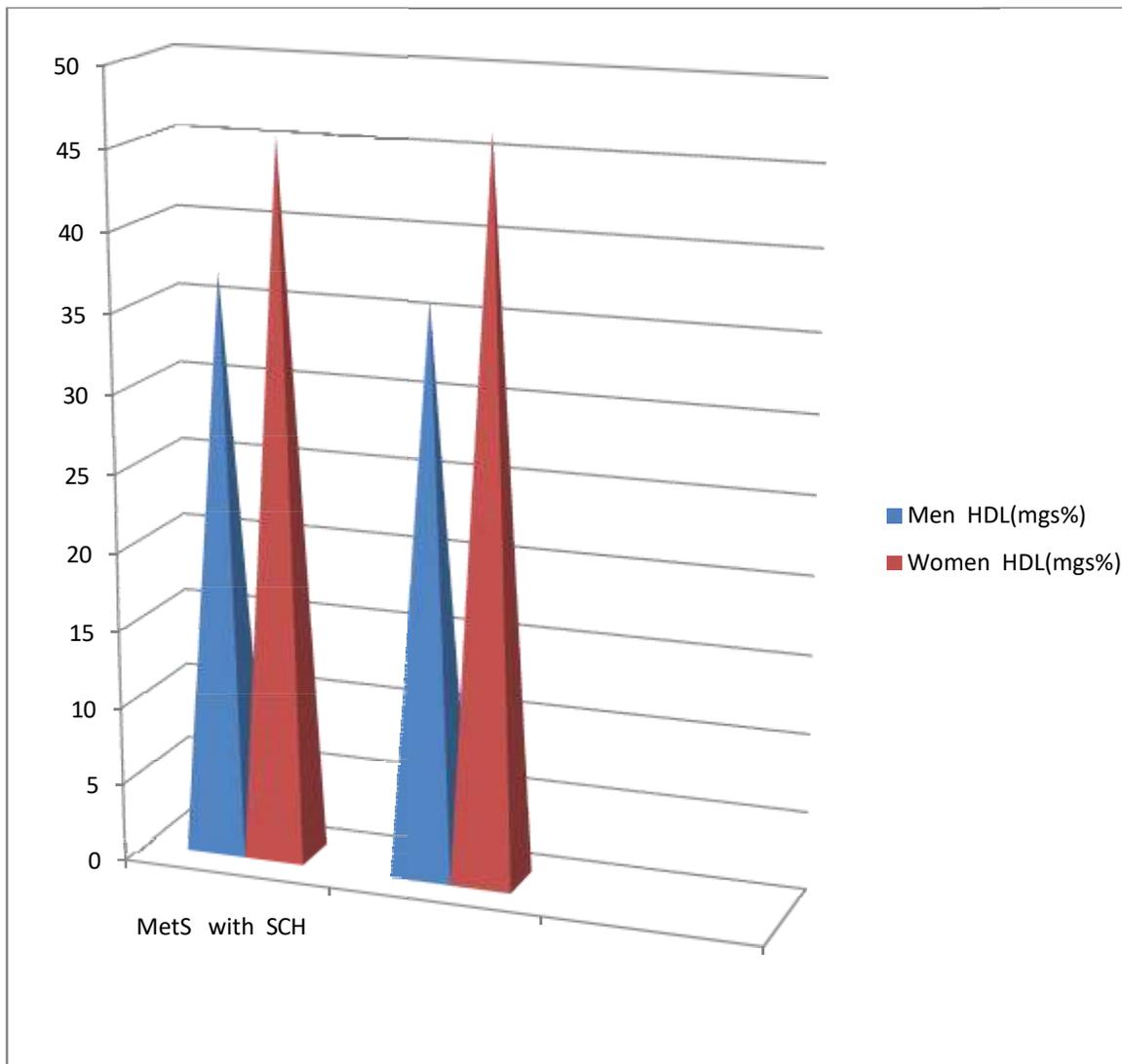
THYROID FUNCTION VS HDL:

	Men HDL(mgs%)	Women HDL(mgs%)
MetS with SCH	37	45.6
MetS with euthyroid	36.2	46.5

Out of the 18 women with both MetS & SCH, 14 had a HDL value less than 50mgs%. Out of the 3 men with both MetS & SCH, 2 had a HDL value less than 40mgs%.

When compared to their, euthyroid counterparts, both men and women with MetS & SCH, had similar HDL values. This rules out HDL, being a definite marker to screen for thyroid dysfunction among MetS subjects.

This also stresses the fact that, in MetS, non-HDL control is more important than improving HDL values alone.



	Men SBP(mm Hg)	Women SBP(mm Hg)
MetS with SCH	132.7	129.9
MetS with euthyroid	136.6	131.4

Out of the 18 women with both MetS & SCH, 7 had a SBP value more than 130mm of Hg. Out of the 3 men with both MetS & SCH, 1 had SBP value more than 130mm of Hg.

When compared to their, euthyroid counterparts, both men and women with MetS & SCH, had similar SBP values. This rules out SBP, being a definite marker to screen for thyroid dysfunction among MetS subjects.

	Men DBP(mm Hg)	Women DBP(mm Hg)
MetS with SCH	88	84.5
MetS with euthyroid	88.5	85.7

Out of the 18 women with both MetS & SCH, 9 had a DBP value more than 85mm of Hg. Out of the 3 men with both MetS & SCH, 1 had DBP value more than 85mm of Hg.

The increase in DBP is due to increased arterial stiffness in both MetS and SCH. But when compared to their, euthyroid counterparts, both men and women with MetS & SCH, had similar DBP values. This rules out SBP, being a definite marker to screen for thyroid dysfunction among MetS subjects.

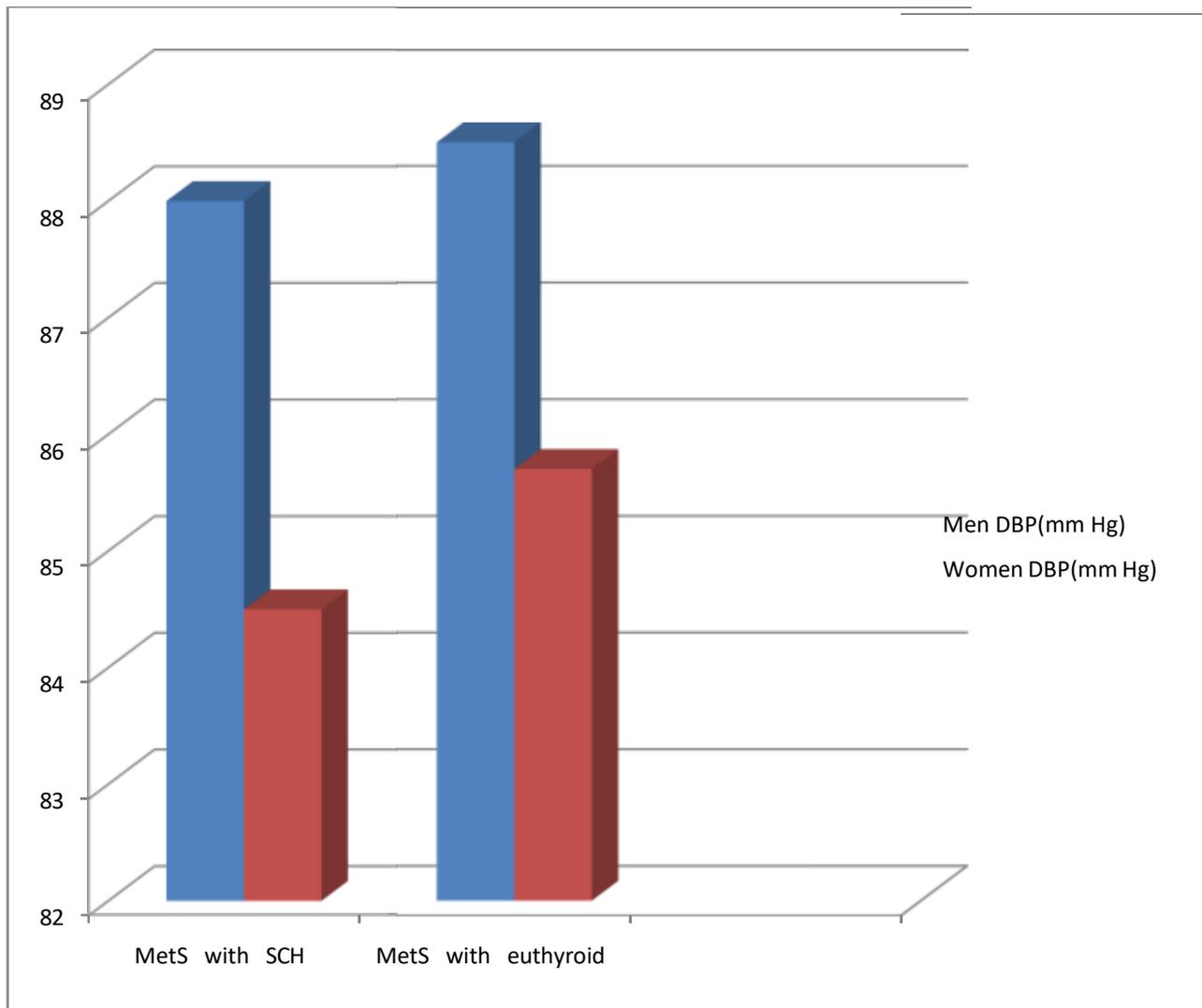


Figure 13

DISCUSSION:

In our study, of 100 MetS, majority were in the 30-40yrs age group, highlighting the at-risk population. Fast changing food habits and sedentary life style pattern, in the last two decades, could be the answer for this metabolic abnormality. This means, economic backbone of our country, is amidst a crisis regarding to health issues.

The prevalence of MetS in women is more than two times, compared to men, in this study. The prevalence of SCH in MetS, was found to be 21%, when compared to only 6% in the control population. This association with SCH, is more frequent among women. Due to increasing sedentary life style changes, the natural immunity against cardiovascular diseases for the women, is at risk.

The thyroid dysfunction in MetS, is statistically significantly associated with the serum triglycerides, followed closely by the waist circumference. This association is not found with the other components of Metabolic syndrome.^{10_18}

The almost nil difference among the subjects, in regard to HDL, once again reiterates the fact that non-HDL cholesterol has to be closely monitored. Unless, strictly managed this double whammy of SCH and MetS will result in a heavy toll, in our growing economy. Intensive life-style, has to be initiated in a much younger population, ie school going children. Only this primordial intervention, can produce significant changes, helping to avert this middle-age menace.^{19_23}

CONCLUSION:

Due to the alarming rise, in CV mortality and morbidity, the people at risk have to be identified at the earliest and their risk factors modified. Hence, diagnosing MetS should become a routine practice among the medical fraternity.²⁴

Even if routine screening for SCH among MetS is not feasible among all patients, Screening for thyroid dysfunction, in MetS, especially those with elevated triglycerides, has to become a part of treatment.

Patients diagnosed to have a double jeopardy, of MetS with SCH, should be intensively treated, with life-style Interventions and if needed, with pharmacological therapy, to achieve the desired therapeutic targets.²⁵

Limitations:

There are few limitations of the present study, first is, this being a cross-sectional study, a cause and effect relationship could not be determined. Further large scale cohort study

Research

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is needed to evaluate the deleterious effect of subclinical hypothyroidism on cardiovascular disease and metabolic functions.

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CONFLICTS OF INTEREST:

There are no conflicts of interest

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