

PREVALENCE OF MASKED HYPERTENSION AMONG PATIENTS WITH METABOLIC SYNDROME IN A TERTIARY CARE CENTRE

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DOI: <https://doi.org/10.15520/ijmhs.v10i12.3168>

Accepted 15/11/2020; Received 15/10/2020; Publish Online 11/12/2020

ABSTRACT

Background: There is strong correlation between masked hypertension and metabolic syndrome. Presence of masked hypertension increases the risk of end organ damage, cardiovascular and cerebrovascular events and hence prevalence of masked hypertension among metabolic syndrome patients and its association with various components of metabolic syndrome needs to be defined.

Aim: The aim of our study is to estimate the prevalence of masked hypertension among patients with metabolic syndrome.

To assess the correlation between masked hypertension and various components of metabolic syndrome.

Materials and Methods: 120 patients of age group 18-65 years, who were admitted in Sree Mookambika Institute of Medical Sciences from January 2020 to October 2020, who had metabolic syndrome were included. Inclusion Criteria included patients with waist line circumference > 102 cm in men and >88 cm in females. Triglyceride level > 150mg/dl, HDL, 40 mg/dl in men and < 50mg/dl in females, FBS > 100mg/dl and pre hypertensive range of BP, systolic 130-139 mmHg and diastolic 85-89mmHg. Chronic hypertensive patients with evidence of end organ damage and patients with severe uncontrolled hypertension were excluded. Relevant data were obtained, Ambulatory BP recordings were taken to identify masked Hypertension. Descriptive and Analytical statistics was performed by SPSS version 20.0.

Results: Out of the 120 patients included in our study, 75 percent had masked hypertension. Our study proved positive correlation between masked hypertension and waist line circumference, elevated FBS, triglyceride, HDL

Conclusion: Our study shows significant prevalence of masked hypertension among patients with metabolic syndrome. Thus early detection of masked hypertension helps in early diagnosis of metabolic syndrome and its better management.

Key words: Masked hypertension–metabolic syndrome

1 INTRODUCTION

Metabolic syndrome refers to a group of metabolic risk factors that increases the risk of cardiovascular disease and diabetes mellitus. Hyperglycemia, central obesity, hypertriglyceridemia, low levels of high-density lipoproteins (HDL), and hypertension are the major components of metabolic syndrome.¹

Masked Hypertension is defined as elevated home or ambulatory BP (>135/85 mmHg) inspite of a normal clinic BP (<140/90 mmHg).² It is found to be associated with increased risk of cardiovascular and cerebrovascular events and end organ damage. In metabolic syndrome we consider only the clinic value of BP recording and ambulatory Bp is not considered. Masked hypertension is also defined among patients taking anti-hypertensive medications.

Hypertension is a major component of metabolic syndrome. Due to modern era sedentary lifestyle, prevalence of hypertension is increasing. However a single clinic recording

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of BP does not reflect the true blood pressure levels.³ They can either be elevated (white coat effect) or they may be normal (masked hypertension). Twenty four hour Ambulatory BP Monitoring (ABPM) is considered to be an accurate method to assess blood pressure levels and diagnose hypertension. It also helps in identifying cases of masked hypertension.⁴⁻⁵ According to ABPM, Hypertension is defined as 24 hour average BP > 130/80mmHg. Average awake hour BP > 135/80mmHg and Average asleep hour BP >120/70mmHg.⁶ Both metabolic syndrome and masked hypertension are risk factors of cardiovascular disease and end organ damage.⁷ Hence the relation between these two should be defined.

2 MATERIALS AND METHODS

After obtaining clearance from IEC and consent from patients, we included 120 patients of age group 18-65 years, who were admitted in Sree Mookambika Institute of Medical Sciences from January 2020 to October 2020, who had metabolic syndrome were included. Inclusion Criteria included patients with waist line circumference >102 cm in men and >88 cm in females, Triglyceride level >150mg/dl, HDL <40 mg/dl in men and <50mg/dl in females, FBS> 100mg/dl and pre hypertensive range of BP, systolic 130-139 mmHg and diastolic 85-89mmHg. Chronic Hypertensive patients with evidence of end organ damage and Patients with severe uncontrolled hypertension were excluded. Relevant data were obtained, Ambulatory BP recordings were taken to identify masked Hypertension. Descriptive and Analytical statistics was performed by SPSS version 20. A p value of less than 0.5 was considered statistical significant.

3 RESULTS

Table 1. Profile of Patients with metabolic syndrome

Variables	Percentage	
Age, years (mean)	40 years +/- 8.6	
Gender	Males	60
	Females	40
Masked Hypertension	Present	75
	Absent	25

Out of the 120 patients included in our study, 75 percent had masked hypertension. Mean age of the study group was 40+/- 8.6 years. 60 percent of the study population were males and 40 percent were females. The mean SBP among people with masked hypertension (MH) was found to be around 138mmHg and DBP around 89mmHg. Mean waist line circumference among patients with masked hypertension was around 100.2 higher than that of mean value among patients without masked hypertension. Mean value of FBS among patients with MH was found to be 138.6mg/dl higher than the value among patients without MH. Mean HDL value among patients with MH was found to be 38.8 lower

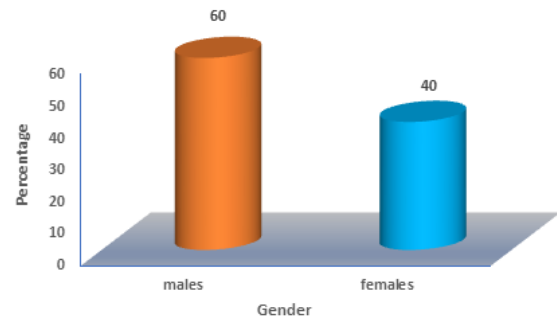


Figure 1. Gender Profile of Patients with metabolic syndrome

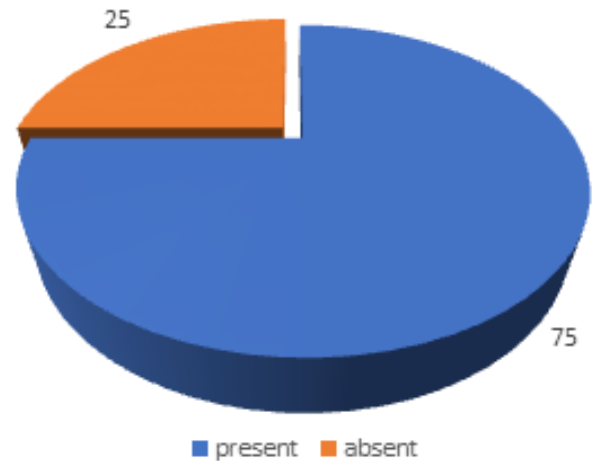


Figure 2. Prevalence of masked hypertension

Table 2. Association between variables of metabolic syndrome and masked hypertension

Variable	Masked Hypertension (Mean)	
	Present	Absent
SBP (130-139mmHg)	138.2	128.9
DBP (85-89mmHg)	89.1	82.4
Waist Circumference (>102 cm in men, >88cm in females)	100.2	94
Fasting blood sugar (>100mg/dl)	138.6	97.1
HDL (< 40mg/dl in men, <50mg/dl in females)	38.8	46.8
Triglyceride (>150mg/dl)	188.7	126.1

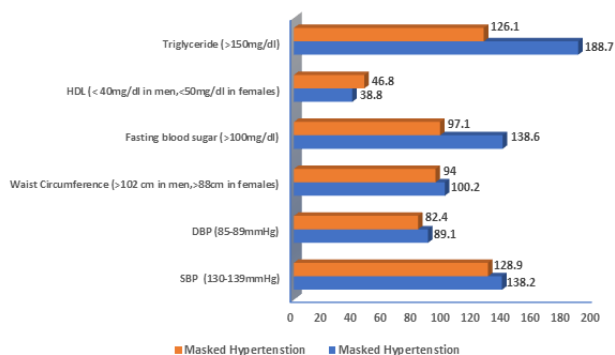


Figure 3. Association between variables of metabolic syndrome and masked hypertension

when compared to mean value among patients without MH. Mean triglyceride level among patient with MH was 188.8 higher that of patients without MH.

4 DISCUSSION

Both masked hypertension and metabolic syndrome are major contributors to cardiovascular and cerebrovascular disorders and end organ damage.⁸ Hence to assess the prevalence of Masked hypertension in patients with metabolic syndrome and its relation with various components of metabolic syndrome needs to be analysed. The detection of masked hypertension in these patients helps in better control of blood pressure levels by aiding dose adjustments in the use of antihypertensives.⁹⁻¹⁰ Also detection of masked hypertension warrants further evaluation of patients and helps in early detection of metabolic syndrome and better management of the same. This helps in avoiding complications like end-organ damage and cardiovascular diseases.¹¹⁻¹²

In our study, a significant 75 percent of patients with metabolic syndrome had masked hypertension. Mean age of the study group was 40+/- 8.6 years. The mean SBP among people with masked hypertension (MH) was found to be around 138mmHg and DBP around 89mmHg. Mean waist line circumference among patients with masked hypertension was around 100.2. Mean value of FBS among patients with MH was found to be 138.6mg/dl. Mean HDL value among patients with MH was found to be 38.8 mg/dl. Mean triglyceride level among patient with MH was 188.8mg/dl. The mean values of BP, FBS, Waist line circumference and triglyceride were higher among patients with masked hypertension in comparison to those without masked hypertension. Also people with masked hypertension was found to have lower HDL levels than those without masked hypertension. Similar results were found in study done by Colantonio LD et al². Also Hanninen MR et al¹ and Thompson JE¹⁵ in their study concluded ambulatory BP as an useful method to analyse risk of metabolic syndrome. Hence our study shows significant correlation of masked hypertension with all major components of metabolic syndrome.

5 CONCLUSION

Our study shows significant prevalence of masked hypertension among patients with metabolic syndrome and positive correlation of masked hypertension with individual components of metabolic syndrome. Thus early detection of masked hypertension helps in early diagnosis of metabolic syndrome and its better management. It can also help in preventing progression to complications like cardiovascular diseases and end organ damage.

[1-15]

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