

Study of Metabolic Syndrome in Stroke Patients At GMCH, Bettiah, Bihar

Vikash Kumar¹, Jay Prakash Himanshu², P. Yugal³

¹Senior Resident, Department of Medicine, Govt. Medical College and Hospital, Bettiah, W. Champaran, Bihar

²Senior Resident, Department of Medicine, Govt. Medical College and Hospital, Bettiah, W. Champaran, Bihar

³Professor and Head of Department, Department of Medicine, Govt. Medical College and Hospital, Bettiah, W. Champaran, Bihar

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Corresponding author: Dr. Jay Prakash Himanshu

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Abstract:

Background: Obesity, hypertension, diabetes, and hyperlipidemia are some of the vascular risk factors that make up the increasingly widespread condition known as the metabolic syndrome. Heart disease and cerebral stroke have both been strongly linked to the illness.

Methods: From March 2022 to August 2022, the current study was carried out at the Department of Medicine, Govt. Medical College and Hospital, Bettiah, Bihar. This study involved 98 patients in total. To record information from the pertinent records, a format sheet that was appropriate had been created. The one sample z test of proportion and the Chi square test were used to analyse the data. It was deemed significant if $p \leq 0.05$.

Results: In 98 patients overall, it was discovered that at least three risk factors for the metabolic syndrome were present in 64 females (65.30%) and 34 males (34.70%). The ages of the participants were 26–98 years old (65.1 ± 12.9) for men and 35–105 years old (64.5 ± 12.1) for women. The patients were multiethnic, and the leading risk factors were obesity/overweight 93 (94.9%), hypertension 81 (82.65%), diabetes mellitus 68 (69.4%), and hyperlipidaemia 50 (51.02%), in decreasing order of frequency. 84 (85.71%) of the cases were of the ischemic type.

Conclusion: In patients with cerebral stroke, the prevalence of metabolic syndrome (MetS) is significant, particularly in females, and ischemic strokes are very common in both sexes.

Keywords: Metabolic syndrome; cerebral stroke; risk factors.

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Introduction

Due to growing knowledge of its link to cardiovascular morbidity and mortality, the term "metabolic syndrome" (MetS) has attracted a lot of attention recently. As characterised by Kylin in the 1920s, it was originally noticed as a clustering of hypertension, hyperglycemia, and gout. Later, in 1947, Jean Vague made note of its connection to android obesity[1,2,3].

Researchers discovered that the overall prevalence of MetS in their local urban areas was quite high, despite the fact that it is one of the world's emerging health problems. They attributed their finding to a number of factors, including increased age, female gender, higher social status, sedentary lifestyle, favourable family history, and higher education. The

aforementioned elements, according to them, were statistically significant MetS predictors.[4]

The pathogenesis of MetS is still not well understood. The fundamental mechanism considered to cause metabolic syndrome is insulin resistance, which is clinically defined as requiring larger quantities of insulin to maintain euglycemia.[5,6] According to the "thrifty gene hypothesis" put forth by Neel[7], genetic variables as well as environmental factors play a role in determining insulin resistance.

The foetal origins of chronic disease and other genetic hypotheses have been put up for Africans [8].

Due to the expanding obesity epidemic in this young population, metabolic syndrome is now not only seen in adults but is now starting to affect children and adolescents [9,10,11].

Material and Methods

From March 2022 to August 2022, this study was carried out at the Department of Medicine, Govt. Medical College and Hospital, Bettiah, Bihar. This study included 98 patients overall, 64 males and 34 females.

Patients were deemed to have the MetS if they had three or more of the following risk factors (RFs). The first was obesity/overweight, which was defined as having a body mass index of at least ≥ 30 kg/m² and/or a waist circumference of at least >102 cm for men and >88 cm for women. According to the most current update, the second factor was hypertension, which is defined as a systolic blood pressure (SBP) of more than

130 mm Hg or a diastolic blood pressure (DBP) of more than 80 mm Hg. Hyperlipidemia (HL), which is defined as total blood cholesterol ≥ 200 mg/dl, or triglycerides ≥ 150 mg/dl, and reduced high density lipoproteins (HDL) less than 40 mg/dl in men and less than 50 mg/dl in women, was the third factor. Diabetes Mellitus (DM), often known as a fasting serum blood sugar level greater than 110 mg/100 ml, was the fourth factor. However, despite the fact that some researchers included the measurement of insulin resistance in the classification of MetS, many others do not, claiming that the gold standard approach cannot be regularly used to evaluate insulin resistance. In this study, the latter trend has been used.

Data were analyzed using one sample z test of proportion and Chi square test. A $p \leq 0.05$ was considered significant.

Results

In terms of gender, there were more female stroke patients 64 (65.30%) than male stroke patients 34 (34.70%) who met the MetS criteria. According to statistics, there was a large gender gap (p value <0.001) (Table 1).

Males varied in age from 26 to 98 years, with a mean age of 65.1 ± 12.9 ; females ranged in age from 35 to 105 years, with a mean age of 64.5 ± 12.1 . Males and females of all ages were most frequently affected between the ages of 50 and 79, where 72.45% of cases occurred. Table 1 demonstrates that cases occurring in people under the age of 40 and over the age of 89 made up only a small fraction of the total (3.24%).

Table 1: Distribution of patients by Age and Sex

Age in years	Males		Females		Total		p-value
	No.	Percentage	No.	Percentage	No.	Percentage	
20-29	0	0%	0	0%	0		
30-39	1	1.02%	1	1.02%	2	2.04%	
40-49	3	3.06%	5	5.10%	8	8.16%	
50-59	6	6.12%	14	14.29%	20	20.41%	

60-69	9	9.18%	20	20.41%	29	29.59%	<0.001
70-79	8	8.16%	14	14.29%	22	22.45%	
80-89	6	6.12%	8	8.16%	14	14.28%	
≥90	1	1.02%	2	2.04%	3	3.06%	
Total	34	34.70%	64	65.30%	98	100.0%	

According to Table 2, the most common RFs for MetS in stroke patients were Obesity/overweight 93 (94.9%), HTN 81(82.65%), DM 68(69.4%), and HL 50(51.2%).

Table 2: Distribution of Risk factors for Metabolic syndrome of stroke patients

Risk Factors	Stroke patients	
	No.	Percentage
Obesity	93	94.9%
Hypertension	81	82.65%
Diabetes Mellitus	68	69.4%
Hyperlipidemia	50	51.02%

Regarding the kind of stroke, the data showed that 84 (85.71%) instances were of the ischemic type, whereas 55 (14.28%) cases were hemorrhagic. Table 3 shows that there was no statistically significant difference in stroke type by gender (p value = 0.599).

Table 3: Distribution of Type of stroke patients by sex

Sex	Type of Stroke				p-value
	Ischemic Stroke		Hemorrhagic Stroke		
Male	29	29.59%	5	5.10%	0.599
Female	55	56.12%	9	9.18%	
Total	84	85.71%	14	14.28%	98 (100.0%)

Discussion

A multiethnic, prospective, population-based cohort study has discovered a significant link between the metabolic syndrome and the risk of ischaemic stroke, independent of other confounding factors like age, education, physical activity, alcohol use, and current smoking. The researchers define the metabolic syndrome as a major public health burden based on its prevalence, risk, and etiologic fraction. Additionally, they asserted that the impact of the MetS is likely to grow given the obesity pandemic. They suggested that early diagnosis and treatment of patients at risk for vascular disease need to be prioritised more, and that a better understanding of gender, racial/ethnic, and other differences and how they affect the MetS will help effectively target populations at higher risk of ischaemic stroke[18]. Their findings and those of the present study had many similarities,

particularly with regard to obesity and stroke. One of the main features of MetS is obesity/overweight. The buildup of extra body fat, which shows as greater weight or a larger waist circumference, is known as obesity. It frequently goes hand in hand with insulin resistance[20]. According to the current study, 93 individuals (94.9%) had obesity, making it the most prevalent RF among the others. The data also indicate that HTN and DM are the conditions that are most prevalent after obesity, with 81 (82.6%) and 68 (69.4%) patients, respectively. Despite the fact that these results are almost identical to those of other studies in the literature, MetS has been found to be more prevalent in the presence of DM than HTN.[12,13,14].

However, other researchers have noted that the current trend of MetS is that it is not only seen in adults but is now also starting to occur in children and adolescents due to the growing obesity epidemic within this

young population.[9,10,11] The majority of patients with MetS 71 (72.45%) were between the ages of 50 and 79 years.

Different researchers have shown gender-specific variances. In Africa, metabolic syndrome was shown to be more prevalent in women and to rise with age and urbanisation(15,16,17); in other research, it was found to be more prevalent in women (70.3%) than in men (49.7%), with a p-value < 0.001.[18].

However, MetS seems to affect more women than men, much like obesity does, while hypertension seems to affect more men than women.18,19,20,21,22 Only men from the Jos plateau in Nigeria were shown to have a greater prevalence of MetS, and the authors speculated that this finding may have been influenced by women's high activity levels. [23]

Researchers have discovered that patients with acute ischemic stroke have a prevalence of MetS of 58.3%; however, in the current study, the prevalence was 86%, which we believe to be highly worrying and important. This data may indicate the need for additional research to determine if the higher prevalence is the result of primary attacks or recurrences.

Conclusion

Obesity and hypertension were the two risk variables that were most common, supporting national health monitoring programmes and systems with their curative and preventative instruments to address such a rapidly expanding issue. Additional research is required to determine whether the rise in the prevalence of ischemic stroke is the result of primary or secondary attacks and to look into the underlying reasons.

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