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"PREVELANCE OF OBESITY AMONG STROKE PATIENTS IN BANGALORE DISTRICT."

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ABSTRACT:

BACKGROUND: Overweight and obesity are defined as abnormal or excessive fat accumulation that presence a risk to health . A body mass index (BMI) over 25 is considered overweight and over 30 is obese. Stroke is defined as a sudden neurological deficit caused by focal vascular lesion in the brain.

AIM OF STUDY: "To determine the prevalence of obesity status of patients with incident stroke in Bangalore ."

METHODOLOGY: In this study, a random sample of 50 patients residing in both urban and rural areas of Bangalore was selected and the study was conducted by getting their concern who met inclusion criteria and exclusion criteria to investigate the outcome measures related to BMI.

RESULTS: The result obtained shows that the prevalence of obesity among stroke patients is more in females than in males. It shows significant difference with the BMI of 25.865±4.775 in Males and 28.192±5.237 in Females.

CONCLUSION: The prevalence of obesity among stroke patients is more in females than in males. On the data collected from over 50 stroke patients in Bangalore district, it can be concluded that the prevalence of obesity among these patients was 24.0%.

KEYWORDS: Stroke, Obesity, Body Mass Index.

INTRODUCTION:

Obesity is the excessive or abnormal accumulation of fat or adipose tissue in the body that may impair health.[1]Obesity has been formally identified as a disease by the World Health Organization (WHO).[2]

At least 2.8 million individuals worldwide die each year as a result of being overweight or obese, indicating that the problem has epidemic proportions. Body mass index (BMI), which is obtained by dividing a person's weight in kilograms by their height in metres squared (kg/m2), is a tool frequently used to categorise adult overweight and obesity. According to the WHO, obesity is classified as a BMI of 30 or above, while overweight is defined as a BMI of 25 or higher.[3]

A stroke is a medically recognised syndrome of abrupt, localised neurological impairment caused by vascular injury (infarction or bleeding) to the brain. The second-most common cause of mortality and disability in the world is stroke. It is not a single disease but rather a combination of risk factors, disease mechanisms, and processes. The most important modifiable risk factor for stroke is hypertension. Millions of individuals are affected by strokes each year, which are an important cause of morbidity and mortality worldwide.[4]

There are two types of stroke [Ischemic stroke and Hemorrhagic stroke]

Ischemic stroke- This develops as a result of a blood clot for any number of reason. When there's a clot in an artery and there is a reduce perfusion in the lenticlostriate arteries {collection of small perforating arteries arising from the anterior part of the of Willis and supply the basal ganglia}lead to the death of the cell, of those neurons and astrocytes and loss of neurologic function. [5]

Hemorrhagic stroke-This is the ruptured blood vessel stroke or bursting or rupturing of a blood vessel results in leaking of blood into the brain. The build up of blood results in inflammation thereby a inflammatory response that increases the total amount of water and cells that are in the brain ,which compresses the nerve and blood vessels and results in secondary ischemia, as well as loss of nerve function and cell function, and ultimately death and that same loss of neurologic function.[5]

Because of ageing populations, its prevalence and disability burden are anticipated to rise in the future. In addition to age, risk factors for cardiovascular disease include hypertension, smoking, diabetes, left ventricular hypertrophy, and atrial fibrillation. Obesity is an elevated risk factor for diabetes, hypertension, and associated consequences, all of which have a significant indirect impact on the epidemiology of stroke.[6]

Finally, the association between obesity and increased risk for stroke is substantially explained by hypercholesterolemia, hypertension, and diabetes mellitus. Most researchers regard these as intermediate variables (i.e., they are each caused by obesity and independently increase the risk of cerebrovascular disease) and, therefore, omit them from models examining the association between obesity and risk for stroke.

NEED OF THE STUDY:

Obesity is a known independent risk factor for stroke.[7]However, the prevalence of obesity post-stroke has very limited data to support it. As there is the lack of literary evidence in the field of prevalence of obesity in stroke patients, so the need for this study arises. This study aims to evaluate the prevalence and of obesity among stroke patients.

METHODOLOGY:

Study design: cross sectional study

In study sample:50 subject with stroke, aged between 18-65 years

Sample method: simple random sampling

Sample size: 50 subjects

Sample setting: community dwelling-Bangalore rural and urbans

INCLUSION CRITERIA:

- patients with hemorrhagic and ischemic stroke
- patient with 1st time stroke
- both the genders.
- subject with age between 18-65 years

EXCLUSION CRITERIA:

- patient with 2nd time stroke
- recovered stroke patients
- transient ischemic stroke

OUTCOME MEASURE:

- BMI (Body Mass Index)

PROCEDURE

- In this cross-sectional study, 30 participants aged between 18 and 65 years will be included based on specific inclusion and exclusion criteria. The selection of these participants will be done using simple random sampling in Bangalore district. The body mass index (BMI) of each subject is calculated.
- BMI is a commonly used measure that relates an individual's weight to their height and is often used to assess if a person is underweight, normal weight, overweight, or obese.

$$BMI = \frac{\text{Weight (in kilograms)}}{(\text{Height})^2 \text{ (in meters)}}$$

BODY MASS INDEX INTERPRETATION:

BMI<18.5:underweight
BMI = 18.5 – 24.9: Normal weight
BMI=25-29.9:Overweight
BMI=30-35:ClassIObesity
BMI = 35 and > 40: Class II Obesity
BMI >= 40: Class III Obesity

Hence, subjects with BMI above 30 are considered obese.

Therefore the prevalence of obesity among stroke patients in Bangalore district is determined.

DATA ANALYSIS AND INTERPRETATION

Table 1: Showing age of stroke patients

Age	Mean	Std. Deviation
Overall	50.44	9.07
Male	51.59	9.18
Female	47.15	8.21

From the study average overall age was found to be 50.44±9.07 years. Out of which average age of male was 51.59±9.18 years and average age of female was 47.15±8.21 years.

Results:

Figure 1: Representing age of stroke patients

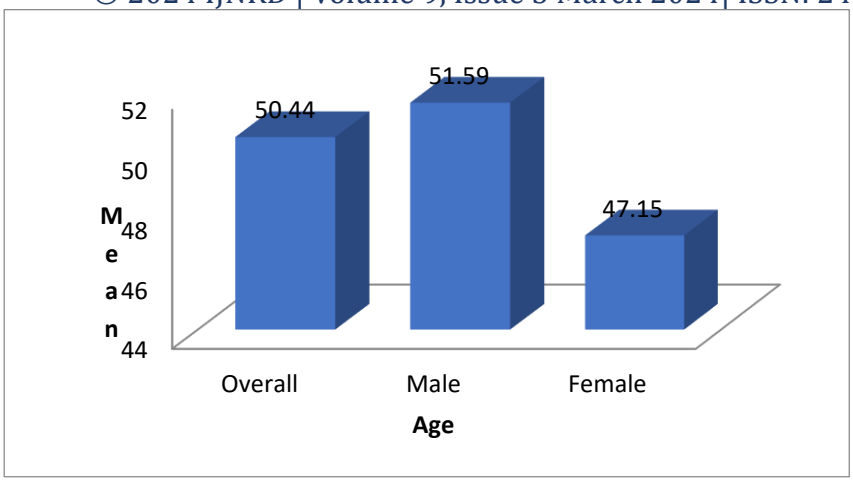


Table 2: Showing height weight, BMI of the stroke patients

SEX		Mean	Std. Deviation
HEIGHT	Male	1.671	0.124
	Female	1.566	0.080
WEIGHT	Male	71.516	10.490
	Female	69.854	15.459
BMI	Male	25.865	4.775
	Female	28.192	5.237

The study on height shows, in male group average height was 1.67±0.124 m and in female group average height was 1.566±0.080 m.
The study on weight shows, in male group average weight was 71.516±10.490 kg and in female group average weight was 69.854±15.459 kg.
The study on BMI shows, in male group average BMI was 25.865±4.775 and in female group average BMI was 28.192±5.237.

Figure 2: Representing mean height, weight, BMI of the stroke patients

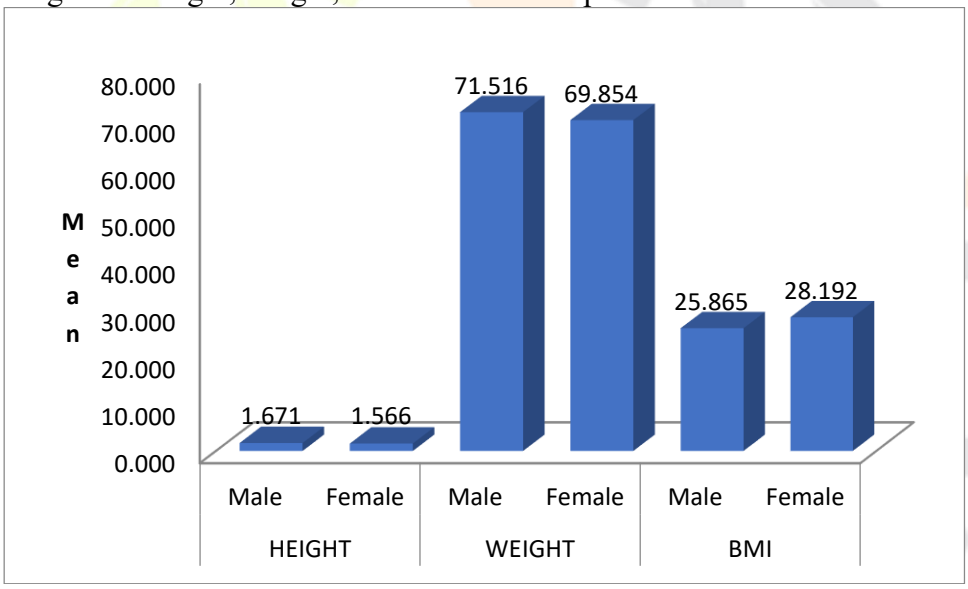


Table 3: Showing BMI classification of the stroke patients

BMI category	Frequency	Percent
Underweight	2	4.0
Normal	19	38.0

Overweight	17	34.0
Obese	12	24.0
Total	50	100.0

Among the 50stroke patients, majority of 19(38%) had normal BMI, 17(34%) had overweight BMI, 12(24%) had obese BMI and 2(4%) had underweight BMI.

Figure 3: Representing BMI classification of the stroke patients

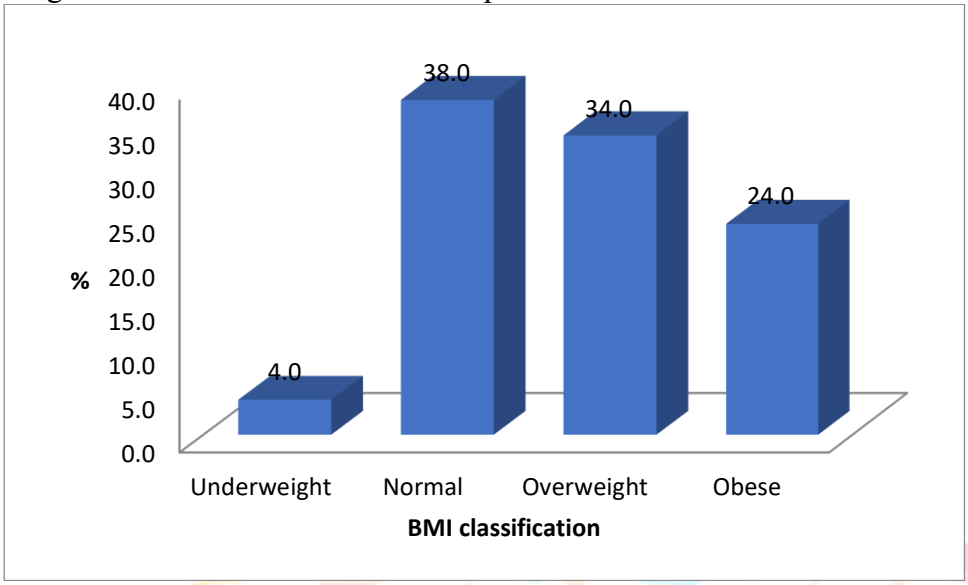


Table 4: Showing BMI classification on the basis of gender

		SEX		
		Male	Female	Total
BMI	Underweight	2	0	2
		5.4%	0.0%	4.0%
	Normal	16	3	19
		43.2%	23.1%	38.0%
	Overweight	13	4	17
		35.1%	30.8%	34.0%
	Obese	6	6	12
		16.2%	46.2%	24.0%
Total		37	13	50
		100.0%	100.0%	100.0%

The prevalence of underweight in male is 5.4% and female is 0.0%. Overall prevalence of underweight in the study population is 4.0%.

The prevalence of Normal in male is 43.2% and female is 23.1%. Overall prevalence of Normal in the study population is 38.0%.

The prevalence of Overweight in male is 35.1% and female is 30.8%. Overall prevalence of Overweight in the study population is 34.0%.

The prevalence of obese in male is 16.2% and female is 42.2%. Overall prevalence of obese in the study population is 24.0%.

Figure 4: Representing BMI classification on the basis of gender

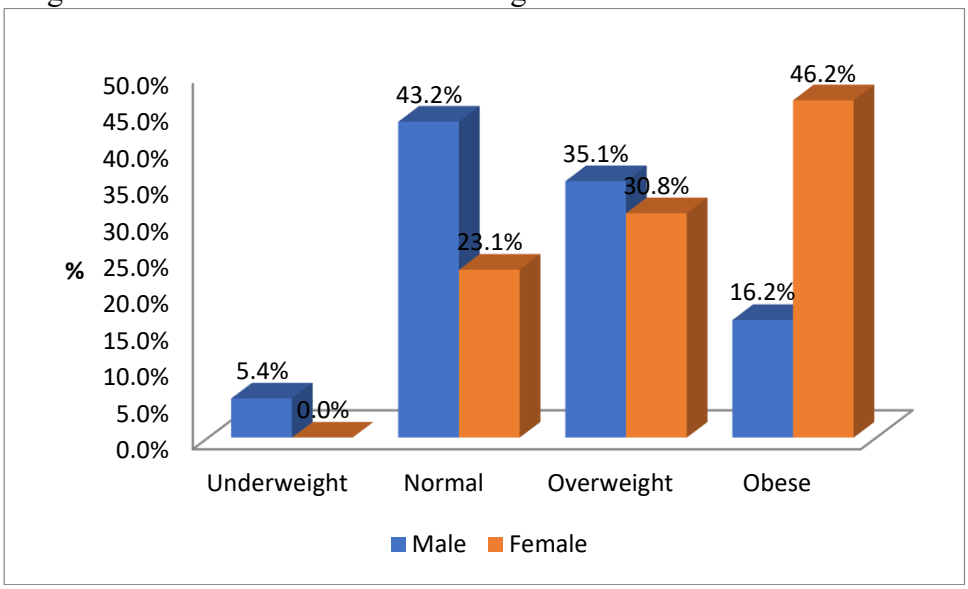
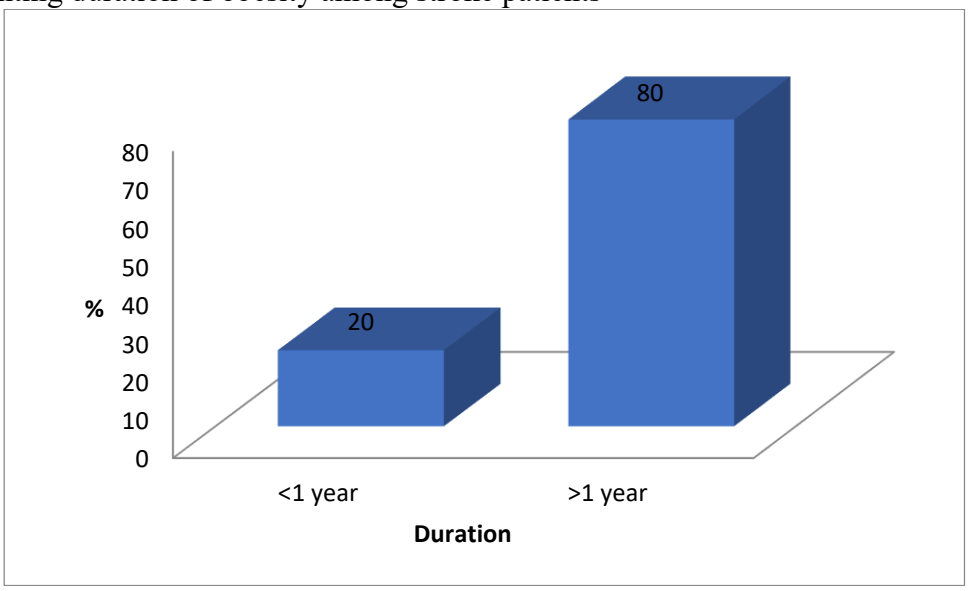


Table 5: Showing duration of obesity among stroke patients

DURATION		Frequency	Percent
	1.2 YEARS	2	4.0
	1.5 YEARS	3	6.0
	1.6 YEARS	1	2.0
	1.8 YEARS	1	2.0
	1.9 YEARS	1	2.0
	10 YEARS	5	10.0
	11 MONTHS	1	2.0
	2 YEARS	5	10.0
	2.3 YEARS	1	2.0
	3 YEARS	2	4.0
	3.2 YEARS	2	4.0
	3.5 YEARS	1	2.0
	4 YEARS	7	14.0
	5 YEARS	4	8.0
	6 MONTHS	1	2.0
	6 YEARS	4	8.0
	7 MONTHS	3	6.0
	8 MONTHS	3	6.0
	8 YEARS	1	2.0
	9 M0NTHS	1	2.0
	9 MONTHS	1	2.0
	Total	50	100.0

The table depicts, 80% had duration of more than 1 year and 20% had duration less than one year.

Figure 5: Representing duration of obesity among stroke patients



DISCUSSION:

The primary objective of this study is to determine the prevalence of obesity among stroke patients. To achieve this, 50 individuals who had experienced a stroke were included in the examination. Among these 50 stroke patients, it was observed that 19 individuals (38%) had a normal BMI=18.5-25, 17 individuals (34%) had an overweight BMI=25-30, 12 individuals (24%) had an obese BMI=30-35, and 2 individuals (4%) had an underweight BMI=<18.5.

In the present study, the results shows the outcomes of age (in years), gender, height(in meters), weight(in kg) and duration of occurance of stroke in the participants of the study.

In this current study overall age were with mean and SD of 50.44±9.07 years. This finding is in line with a study conducted by Jong-Ling Fuh. et al. which yields similar result.[8]

Out of which the outcome of age for male were with mean and SD of 51.59±9.18 years. This is in line with study conducted by Carlos M.Meclon. et al. which yields similar result in men.[9]

Outcome of age for female were with mean and SD of 47.15±8.21 years. This is in line with study conducted by Gauthier Duloquin;Quentin Thomas. Et al. which yields similar result in women.[10]

In the current height study indicates that, in the male group, the result for height had a mean and standard deviation of 1.67±0.124 meters, whereas in the female group, the outcome height had a mean and standard deviation of 1.566±0.080 meters. This finding is in line with study conducted by Yuji Shimizu,MD,PHD. et al. state's, that Height was found to be inversely associated with the risk of stroke for both men and women.[11]

In the current weight-study reveals that in the male group, the mean and standard deviation for outcome of weight were 71.516±10.490 kg, while in the female group, the mean and standard deviation for outcome of weight were 69.854±15.459 kg.

The BMI study reveals that, in the male group, the average BMI had a mean and standard deviation of 25.865±4.775, while in the female group, the average BMI was 28.192±5.237, also with a mean and standard deviation. This finding in line with study conducted by Christian Dehlendroff. Et al. which yields similar result.[12]

The current study shows prevalence of obesity among stroke patients is more in females than in male, as per the result , The prevalence of obesity in males is 16.2% and females is 42.2%. Overall prevalence of obese in the study population is 24.0%.This is in line with study done by Merel S.Ekkar, Jamie I.et al. which yields similar result.[13]

In the overall stroke patients,80% had duration of more than 1 year and 20% had duration less than one year.

LIMITATIONS:

- This study does not include acute stroke and TIA patients
- Patient needs assistance for the assessment of BMI
- The study sample size was small, which included only 50 patients

RECOMMENDATION:

- Studies with a larger sample size can be undertaken in future to achieve better results as this was conducted with a small sample size .

CONCLUSION:

- Based on the data collected from over 50 stroke patients in Bangalore district, it can be concluded that the prevalence of obesity among these patients was 24.0%.
- The prevalence of obesity among stroke patients is more in females than in males.

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