

A Study on Management of Stroke in a Tertiary Care Hospital

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Abstract - Aim : According to World Health Organisation, 15 million people suffer stroke worldwide each year. Of these 5 million die and another 5 million are permanently disabled. Stroke has already reached epidemic proportions .1 in 6 people worldwide will have a stroke in their life time. One of the main disease processes leading to stroke is Diabetes Mellitus. The prevalence of stroke increases significantly with age and other risk factors includes tobacco use, physical inactivity, unhealthy diet, harmful use of alcohol, atrial fibrillation, raised lipid levels, obesity ,male gender, genetic disposition and psychological factors. So it is necessary to identify the risk factors and to assess the prescription pattern of stroke, whereby further complications can be prevented to a larger extend.

Objectives: To assess the prevalence of stroke, to assess the risk factors associated with stroke ,to assess the prescription pattern of stroke, to assess the impact of patient counseling regarding stroke.

Materials and Methods : A prospective observational study conducted for a period of six months in Intensive Care Unit of Basaveshwara Medical College Hospital and Research Centre ,Chitradurga.

Results: The prevalence of stroke was found to be 50 %.The non modifiable risk factors mainly include age and sex. The age group between 51- 60 were more prone to have stroke(57.3%),among which males are more prone (68.8%). Modifiable risk factors which includes hypertension, diabetes mellitus, alcohol and smoking. Among these risk factors hypertension is more prevalent (85.2%).The most commonly prescribing drugs given for the management of stroke were anti hypertensives (26.1%) ,followed by other drugs which includes citicoline and piracetam (23.5%), followed by antiplatelets which includes clopiogrel, aspirin mixed (17.5%), followed by hypolipidemic drugs (12.7%).The least prescribed drugs were anti diabetics (5.3%) .

Conclusion: The present study helped to identify the cases with predominant symptoms of stroke and to estimate various risk factors in such patients. These findings in our study stress the need for early appropriate management to prevent further complications of stroke. Combination therapy, life style changes and better management of risk factors said to have a major effect on recovery of stroke with improved symptoms.

Keywords: Prevalence, risk factors, prescription pattern

I. INTRODUCTION

A stroke is defined as an acute loss of neurological function due to an abnormal perfusion of brain tissue. Most strokes are ischemic (87%) in nature and commonly result from an arterial obstruction by a thrombus or embolus. Hemorrhagic strokes (13%) are caused by rupture or leak of a blood vessel either within the primary brain tissue or subarachnoid space. Stroke is one of the commonest causes of death and a major cause of disability worldwide. [1]

High-risk or stroke-prone individuals can be identified and targeted for specific management and interventions.[2]

The management of modifiable and potentially modifiable risk factors or risk markers for a first stroke is reviewed. Non modifiable factors, such as age, sex, race/ethnicity, and various genetic factors are mentioned in the context of risk stratification for a first stroke.[3]

Hypertension is a major risk factor for ischemic stroke and intra cerebral hemorrhage(26.6%).[4]

Since 1990, the prevalence of those diagnosed with diabetes rose 61%, with an increase of 8.2% from 2000 to 2001. The relative risk of stroke in persons with type 2 diabetes reaches a maximum in the 40–60-year-old group, with diabetic women comprising a greater proportion of patients with stroke than non diabetic women (43%). [5]

Increased high density lipoprotein (HDL) cholesterol levels are associated with reduced risk of ischemic stroke in men and women, in the elderly, and among different racial and ethnic groups (27%). [6]

Smoking is an independent risk factor for stroke which can be reduced with smoking cessation. Smoking cessation is associated with a rapid reduction in the risk of stroke to a level that approaches although never reaches, the risk of those who never smoked within 2 to 5 years of cessation. [7]

The American Diabetes Association recommends aspirin therapy for adults (75 mg/dl). It is recommended for cardiovascular prophylaxis for persons with high risk (6%–10%). Aspirin can be useful for prevention of a first stroke among women whose risk is sufficiently high for the benefits to outweigh the risks associated with treatment. [8]

The protective effects of physical activity have been reported for different ages, sexes, and race/ethnicities in large studies, including the National Health and Nutrition Examination Survey Study and the Northern Manhattan Stroke Study. [9]

The major focus of this study is given to the management of modifiable risk factors for stroke, including hypertension, diabetes, dyslipidemia, atrial fibrillation and other cardiac conditions, carotid artery stenosis (CAS), smoking, poor diet, and also about the management pattern and makes the people aware of those factors.

Section 1 contains the definition of stroke and its classification.

Section 2 and 3 contains the modifiable and non modifiable risk factors for stroke .

Section 4,5,6,7 deals with the prevalence and risk factors of stroke.

Section 8,9 contains the management of stroke which includes pharmacological and non pharmacological treatment.

Last section concludes with the major focus of the study.

II. RELATED WORK

Yong Gan *et al.*, (2016) explained a community-based cross-sectional study with 8,018 Chinese adults aged ≥ 40 years was used to determine the prevalence of stroke and associated risk factors.

Within the screened population, the prevalence of stroke was 2.21% for both sexes, 1.60% for females, and 3.18% for males. Prevalence increased with age in both sexes ($P < 0.0001$). In a multivariable model, factors significantly associated with stroke were increasing age (odds ratio [OR] = 1.87, 95% CI: 1.58–2.24), male gender (OR = 2.03, 95% CI: 1.42–2.90), family history of stroke (OR = 4.33, 95% CI: 2.89–6.49), history of hyperlipidemia (OR = 1.87, 95% CI 1.31–2.68), history of hypertension (OR = 1.47, 95% CI 1.02–2.12), and physical inactivity (OR = 1.74, 95% CI: 1.16–2.59) [10].

Olatunji L K *et al.*, (2015) studied a retrospective study where a questionnaire was used to extract relevant data. A total of 115 patients with the clinical diagnosis of stroke were admitted during the study period, but only 88 had complete information out of which 12 (13.6%) had type 2 diabetes. The mean age of the diabetic group (69.67 ± 12.7 years) was found to be significantly higher than that of the non diabetic group (56.93 ± 16.06 years) ($t = 2.615$, $P = 0.011$). Ischemic stroke occurred more frequently in the diabetes stroke co-morbid group. However, the difference was not statistically significant ($\chi^2 = 0.079$, $P = 0.540$). Outcome in terms of neurological recovery tended to be poor in the diabetes-stroke co-morbid group as compared to the non diabetes stroke group ($\chi^2 = 13.93$, $P = 0.006$) [11].

Mi Yang Jeon *et al.*, (2015) described an interventional study in which this study targeted 93 elderly people living at home residing in E province with 1 or more stroke risk factors, including high blood pressure, diabetes, hyperlipidemia, obesity, smoking, or drinking alcohol. The 12-week program included a stroke education class once a week, a nutrition management class once a week, and exercise guidance 3 times a week. Each session lasted 50–70 min. Each disease education and nutrition management session lasted for 20 min and each exercise session lasted for 30–50 min and the analyzed result were the experimental group's body mass index (BMI) ($t = 8.27$, $p < .001$), systolic blood pressure ($t = 2.39$, $p = .021$), fasting blood sugar ($t = 0.39$, $p = .700$), total cholesterol ($t = 4.18$, $p < .001$), triglyceride levels ($t = 2.50$, $p = .016$), and depression scores ($t = 5.48$, $p < .001$) were significantly reduced and high-density phosphor lipid protein levels increased significantly by the end of the program ($t = -2.94$, $p = .005$) [12].

Sidheswari R et al .,(2015) performed a retrospective descriptive was conducted on 80 patients. Among enrolled patients, 55 were males and 25 were females. Age distribution: <40 years, n=4; 40-60 years, n=50; and >60 years, n=26. Dyslipidemia as per ATP III guidelines was present in 92.5% cases (n = 74). In this study, high LDL was found in 16 cases (21.62%), high total cholesterol in 16 cases (21.6%), low HDL in 57 cases (77%), high triglycerides in 13 cases (17.56%) and elevated non HDLc (>130mg/dl) in 28 patients (37.8%). Risk factors for stroke present were hypertension (n=48, 60%), diabetes (n=18, 22.5%), both diabetes and hypertension (n=15, 18.75%), smoking (n=33, 41.25%), alcoholism (n=32, 40%) and more than 2 risk factors were present in 28.75% (n=23). Total number of deaths was 05% [13].

Sangram Vurumadla et al .,(2015) carried out a prospective study involving 150 patients ,100 (66.66%) patients presented with symptoms like slurred speech, followed by weakness on right side in 97 (64.66%) patients, headache in 88 (58.66%) patients, change in speech in 87 (58%) patients, weakness on left side in 58 (38.66%) patients and deviation of mouth in 48 (32%) patients. The most common risk factors associated with the stroke was hypertension in 102 (68%) patients, followed by dyslipidemia in 81 (54.2%) patients, diabetes mellitus in 51 (34.6%) patients, heart disease in 49 (32.6%) patients, smoking in 44 (29.3%) patients, diet in 16 (10.6%) and alcohol in 12 (8%) patients. Majority of the stroke patients was prescribed with anti platelets (85%), dyslipidemics (75%), anticoagulants (36%), and Mannitol (98.5%)[14].

III. METHODOLOGY

Study Site: The study was carried out at Basaveshwara Medical College Hospital & Research Centre on in patients.

Study Design: A prospective interventional study.

Study Period: The study was carried out for a period of six months.

Study Subjects: This study includes the in-patients treated in Basaveshwara Medical College & Research Centre

Inclusion Criteria:

- Subjects of age \geq 30 years.
- Subjects of in- patients.
- Subjects of both genders who were willing to give informed consent.
- Subjects who were diagnosed with stroke with Diabetes Mellitus, Hypertension ,Dyslipidemia
- Subjects who were admitted in Intensive Care Unit

Exclusion Criteria:

- Subjects who were diagnosed with carcinoma
- Subjects who were at coma stage
- Subjects with diabetic foot ulcer
- Subjects with seizure at onset
- Subjects undergoing major surgery or serious trauma within 14 days

Sources of data :-

- Laboratory reports
- Medical records of the patient
- Direct intervention with the patient

Study procedure:

- The study was started after obtaining the institutional ethical committee (IEC).
- Patients who satisfy above study criteria were included into the study after taking the consent from the bystander.
- Patient's demographic details, complaints, history, diagnosis, and prescribed drugs were collected from the medical records of the patient and documented in a suitably designed data collection form as well as log book.
- Data was collected using a standard questionnaire after receiving written consent from the patient bystander.

The obtained data was be analyzed by using statistical method.

Statistical Analysis:

- Collected data was analyzed by using latest SPSS software.
- Descriptive method was used to analyze the result.
- Odds ratio was used to study the risk factor.

Ethical Approval : This study was approved by the Institutional Ethical Committee of S.J.M. College of Pharmacy, Chitradurga.

Wide number : SJMCP/IEC/PHARM D /11/17-18

IV. RESULTS AND DISCUSSION

Stroke is becoming an important risk of premature death and disability in countries like India, largely driven by demographic changes and enhanced by the increasing prevalence of the key modifiable risk factors. As a result developing countries are double the burden of both communicable and non communicable diseases. Among stroke patients, those who are financially poor they cannot afford proper therapeutic management for the disease. So it is necessary to educate them and prevent the further possible complications. Currently stroke can be considered as a greatest public health problem in many countries. Because of cultural and economic diversity, the risk factors may vary from region to region within the country. As we discussed earlier the risk for stroke includes age, gender, race, family history, diabetes mellitus, hypertension, atrial fibrillation etc. Similarly in our project a prospective observational study on Management of Stroke in a Tertiary Care Hospital, out of 122 samples, 61 patients were diagnosed with stroke with a prevalence of 50%. This was found to be higher in men (68%) as compared to females (31.1%) in the mean age group of 51-60 (57.1%) were more prone to stroke during 6 months study period. This has been graphically presented in fig.1 and 2.

A similar study was conducted by Gan *et al.*, on prevalence and risk factors associated with stroke in middle aged and older Chinese: A community-based cross-sectional study and concluded that a total of 8,018 participants (4,937 females, 61.57%) were investigated in this study. 177 prevalent cases of stroke were identified. The prevalence rate of stroke among the study population aged ≥ 40 years was 2.21%. Males had a higher prevalence (3.18%) of stroke than females (1.60%). Participants who had a higher prevalence of stroke were of age above 40 are more prone to have stroke [10].

Similar study by Zhang *et al.*, The prevalence of stroke, associated risk factors among adults aged 40 years or older were high. Diabetes Mellitus and hypercholesterolemia are pathologies notoriously established as risk factors. But in this case they were not statistically significant, because the findings from our study is based on social and pathological conditions. A higher regional prevalence of hypertension, dyslipidaemia and lack of exercise may be responsible for stroke [15]. In the current study, a total of 61 patients, the major identifiable risk factors were hypertension which was more prevalent (85.2%) followed by diabetes mellitus (75.4%), respectively. The other risk factors includes social habits like smoking (36%) and alcohol (32%) respectively [12]. This has been depicted in table no.12,13.

Similar study was conducted by Sangram Vurumadl *et al.*, on risk factors and prescribing pattern of drugs used in stroke patients, where it estimates various risk factors. The findings in their study stress the need for early and appropriate management of stroke to prevent further complications of stroke. Combination therapy, lifestyle changes and better management of risk factors said to have a major effect on recovery of stroke with improved quality of life and symptoms [14].

The initial treatment of stroke aims at restoring brain perfusion rapidly with intravenous (iv) thrombolysis using iv recombinant tissue plasminogen activator (rt-PA), which is effective up to 4½ hours after symptom onset. In the current study, prescriptions of drugs associated with stroke, majority of the patients were treated with antihypertensives (26.1%), followed by piracetam, citicoline (23.5%), anti platelets (17.5%), anti coagulants (14.5%), hypolipidemics (12.7%), anti diabetics (5.3%). This is graphically depicted in fig.no.7

Similar study by Abbasi MY *et al.*, conducted study on prescribing pattern of drugs in stroke patients: A prospective study among the 102 patients, 77 (75.49%) were administered with piracetam and citicoline followed by clopidogrel (47.05%). In anticoagulants, only enoxaprain 27 (26.47%) was used in their hospital for stroke patients [16].

In the current study odds ratio was used to assess the risk factor. Here we use odds ratio because this was a binomial categorical data that is used to determine whether a particular exposure is a risk factor for a particular outcome, and to compare the magnitude of various risk factors for that outcome. Confidence interval was found to be 95% and assess the risk factors like age, sex, hypertension, diabetes mellitus, smoking and alcohol.

Similar study by Zhang *et al.*, student t test was used to identify the risk factors, prevalence rate and 95% CIs for stroke and risk factors was generated by a range of characteristics such as age, gender, place of residence and level of education. P value was found to be <0.001 [15].

Many of the patients were unaware about risk and symptoms of recurrent stroke. This lack of knowledge will lead to increased incidence of sedentary complications. In order to prevent that, a healthy life style can reduce the higher risk of stroke. The impact of pharmacist intervention regarding diseases, diet and life style modifications among stroke patients were also improved in our study.

Similar study by Jeon M Y *et al.*, on effects of a Stroke Primary Prevention Program on Risk Factors for At-Home Elderly. Based on the results of this study, participating in a stroke prevention program enabled at-risk elderly participants who lived at home in rural areas to perform health-promoting behaviors[17]. Another by Gardois *Pet al.*, on health promotion interventions for increasing stroke awareness in ethnic minorities: a systematic review of the literature Eleven case reports and four RCTs provide evidence about stroke awareness interventions organized in the US. The studies provide only partial and inconclusive evidence about the effectiveness of the interventions. Hence, further research is needed on different countries and ethnic minorities.

Koenig K L made his study on Stroke-Related Knowledge and Health Behaviors Among Post stroke Patients in Inpatient Rehabilitation Stroke patients participating in inpatient rehabilitation and their caregivers have large gaps in stroke knowledge and have suboptimal personal health behaviors, thereby putting patients at high risk for recurrent stroke. Our finding highlights the need to develop stroke-education programs for rehabilitating patients that are effective in closing these gaps in knowledge and personal health behaviors[18].

V. RESULTS

The stroke patients were identified ,the demographic details including age ,sex, D.O.A , D.O.D ,and hospital number were collected. The various risk factors including Hypertension, Diabetes Mellitus, Dyslipidemia, Alcohol ,Smoking were identified and collected. The drugs prescribed for stroke ,dose, route ,and frequency was also collected. The above mentioned details were collected in a suitably designed data collection form by interviewing the patients.

PREVALENCE OF STROKE AMONG STUDY SUBJECTS:

Number of subject enrolled in the study (N)=122

Number of subject with stroke: 61

Prevalence = $\frac{\text{Person with the given health indicator during a specified time period} \times 100}{\text{Population during the same time period}}$

Prevalence of Stroke (p)= $\frac{61 \times 100}{122}$

Prevalence of Stroke (p)= 50%

ASSESEMENT OF RISK FACTOR OF STROKE BY ODD RATIO.

1) Non-modifiable risk factors (n=61)

Table 1 – Non modifiable risk factors

	Variables	No of stroke patient	Odd ratio	Confidence interval
age groups (in years)	51-60	35	0.0286	95%
	More than 65 years	26	0.038	
Sex	Male	42	0.45	
	Female	19	0.052	

Assessment of risk factors was done by using ODD RATIO. Non modifiable risk factors mainly includes age and sex . It is concluded that out of 61 stroke patients the age groups between 51-60 reported more number of cases (35) in which males (42) are more common. Age group more than 65 years,26 patients were found to have stroke ,among which 19 patients were females. The confidence interval was found to be 95%.This indicates there is an clear association between risk factors and stroke. This is depicted in table number. 1

2) Modifiable risk factors (n=61)

Modifiable risk factors were assessed by ODD RATIO. This mainly includes Hypertension, Diabetes Mellitus , Smoking, and Alcohol. The confidence interval was found to be 95 %.. The most common risk factor was found to be hypertension(52).The least risk factor was found to be Alcohol (20). This is represented in the table number.2

Table 2 – Modifiable risk factors

Variables	No of patient	Odd ratio	Confidence interval
Hypertension	52	0.019	95%
Diabetes mellitus	46	0.0217	
Smoking	22	0.045	
Alcohol	20	0.05	

Pattern of prescribing

The most commonly prescribing drugs given for the management of stroke were anti hypertensives with a frequency of 88(26.1%) ,followed by other drugs which includes citicoline and piracetam with a frequency of 79(23.5%), followed by antiplatelets which includes clopiogrel, aspirin mixed with a frequency of 59 (17.5%), followed by hypolipidemic drugs with a frequency of 43(12.7%).The least prescribed drugs were anti diabetics with a frequency of 18(5.3%).

Table 3 –Pattern of prescribing

Class of drugs	Frequency	Percentage
Antihypertensive	88	26.1
Anti-diabetic	18	5.3
Anti-platelets	59	17.5
Hypolipidaemic	43	12.7
Anti-coagulant therapy	49	14.5
Other drug	79	23.5

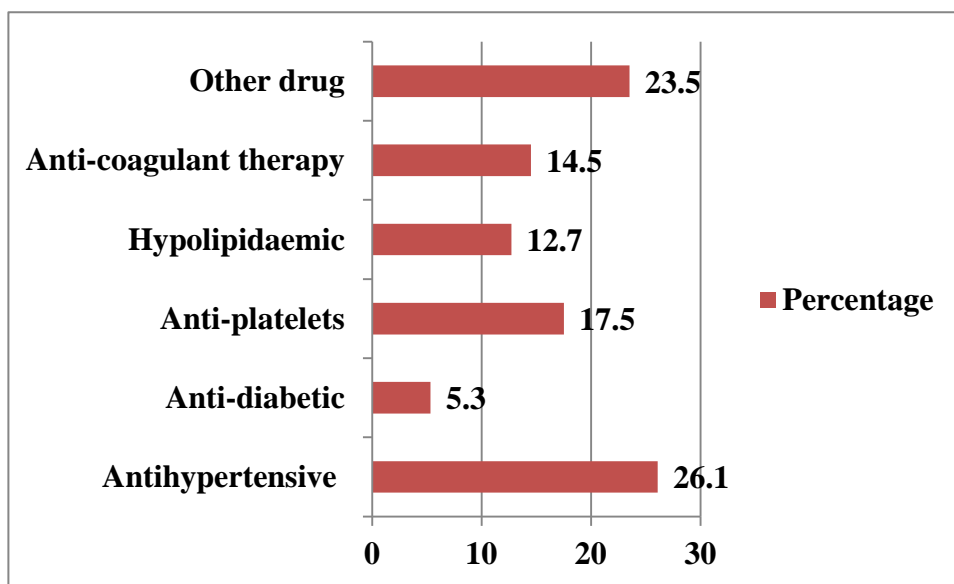


Fig No.1

Distribution based on anti-hypertensive therapy (n=88)

Out of 88 antihypertensive drugs , the drugs of choice were ACE inhibitors, ARB, Calcium Channel Blockers, Beta blockers and diuretics. Among which the most commonly prescribed drugs were diuretics which includes furosemide and mannitol with a frequency of 60(68.1%) and the least prescribed drugs were beta blockers which includes atenolol with a frequency of 1 (1.1%).This is enlisted in table No.4 and figure 2

Table 4 – Distribution based on anti-hypertensive therapy

Class	Generic name	Frequency	Total	Percentage
ACE inhibitors	Ramipril	11	11	12.5
Angiotensin receptor blocker	Telmisartan	6	6	6.9
Calcium channel blocker	Amlodipine	10	10	11.3
Beta blockers	Atenolol	1	1	1.1
Diuretics	Furosemide Mannitol	54 6	60	68.1

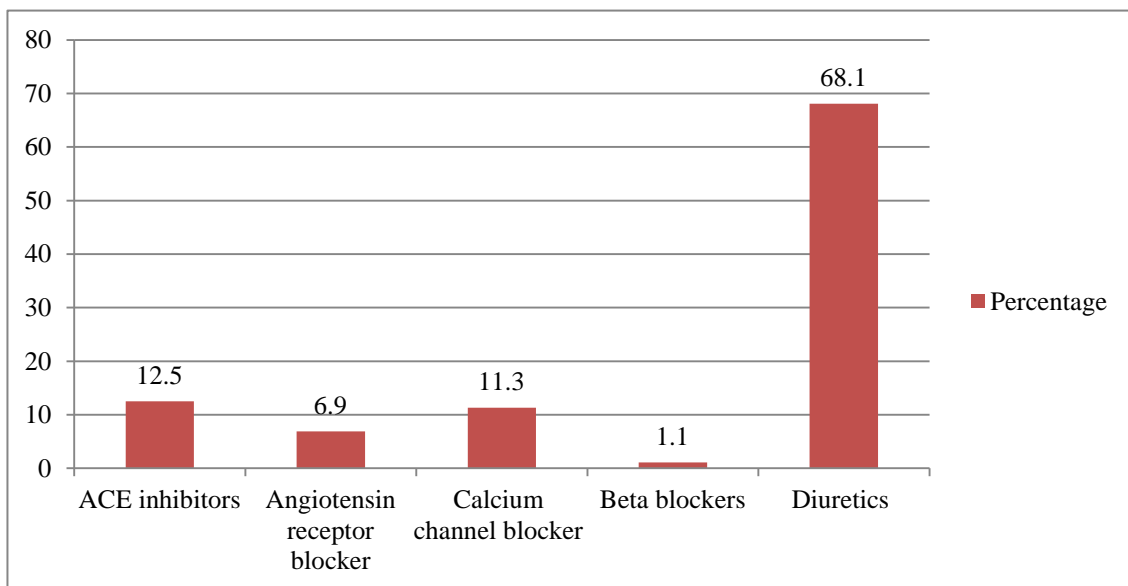


Figure No.2

Distribution based on anti-diabetic therapy (n=18)

Out of 18 anti diabetic drugs the choice of drugs were insulin, glipizide and metformin, glimepride the most commonly prescribed drugs were insulin with a frequency of 15(83.3%) and the least prescribed drugs were glimepride with a frequency of 1 (5.5%).This is depicted in table5 and figure 3

Table 5- Distribution based on anti diabetic therapy

Drugs	Frequency	Percentage
Insulin	15	83.3
Glipizide +metformin	2	11.1
Glimpride	1	5.5

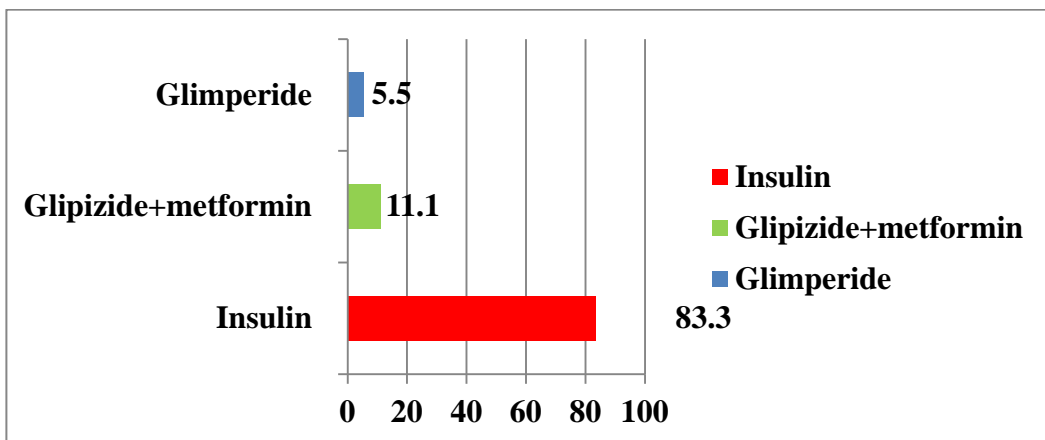


Fig no 3

Distribution based on anti-platelets therapy (n=59)

Anti platelet drugs commonly includes clopidogrel, aspirin and mixed .Among which the most commonly prescribed drugs includes clopidogrel with a frequency of 17(28.8 %). Asprin and clopidogrel occurs with a frequency of 2(3.3%).This data is being depicted in table 6 and figure 4.

Table No.6- Distribution based on antiplatelets therapy

Drugs	Frequency	Percentage
Clopidogrel	17	28.8
Aspirin	40	67.9
Aspirin+ Clopidogrel	2	3.3

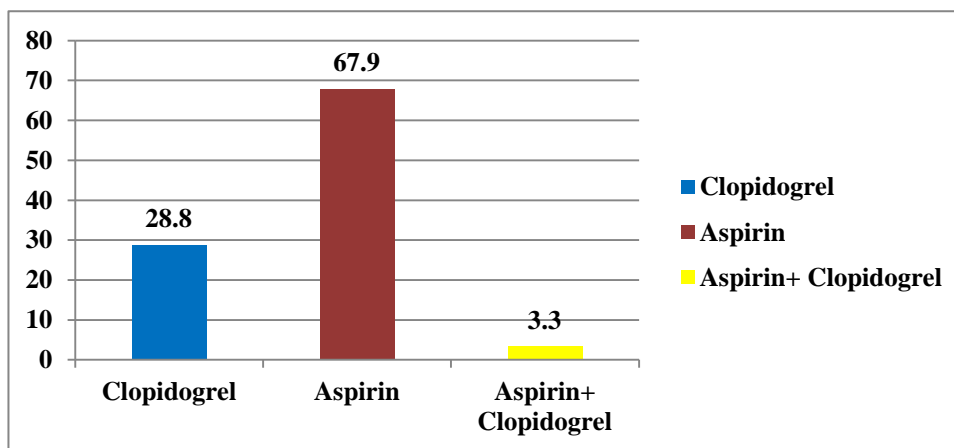


Fig No. 4

Distribution based on hypolipidaemic therapy (n=43)

A total 43 hypolipidaemic drugs the most commonly prescribed drugs are atorvastatin with a frequency of 39 (90.7%) and the least ones were rosuvastatin with a frequency of 4 (9.3%). This is depicted in table 7 and figure5

Table 7- Distribution based on hypolipidaemic therapy

Drugs	Frequency	Percentage
Atorvastatin	39	90.7
Rosuvastatin	4	9.3

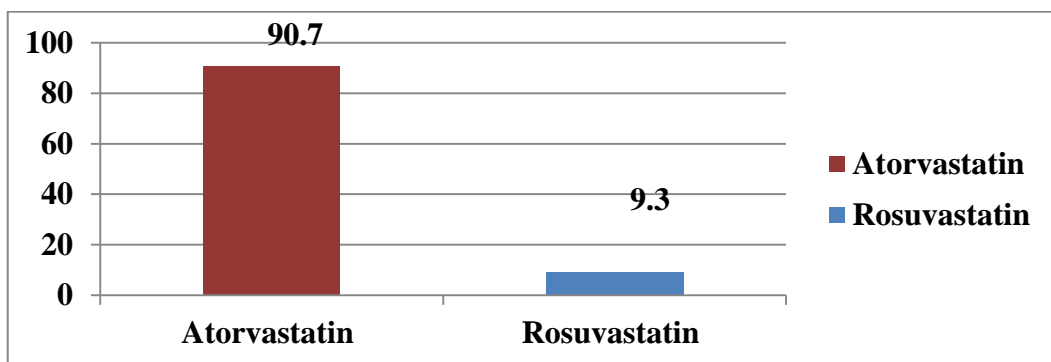


Fig No.5

Distribution based on anti-coagulant therapy (n=49)

Anticoagulant therapy mainly includes heparin, warfarin and enoxaparin. Out of 49 drugs, the most commonly prescribed drugs were heparin with a frequency of 33 (67.4%). The least prescribed drugs were enoxaparin with a frequency of 6 (12.2%). This is depicted in table 8 and figure 6

Table 8-Distribution based on anti coagulant therapy

Drugs	Frequency	Percentage
Heparin	33	67.4
Warfarin	10	20.4
Enoxaparin	6	12.2

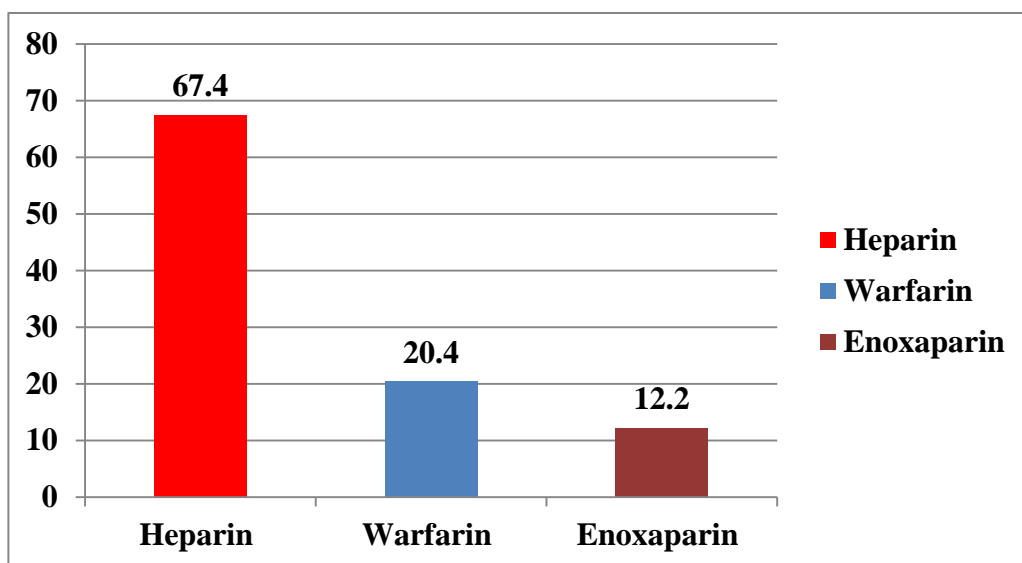


Fig No.6

Distribution based on other drug therapy (n=79)

The other drug therapy commonly includes citicoline and piracetam. Among which piracetam was the most commonly prescribed drug with a frequency of 49 (62%).

Table 9- Distribution based on other therapy

Drugs	Frequency	Percentage
Citicoline	30	38
Piracetam	49	62

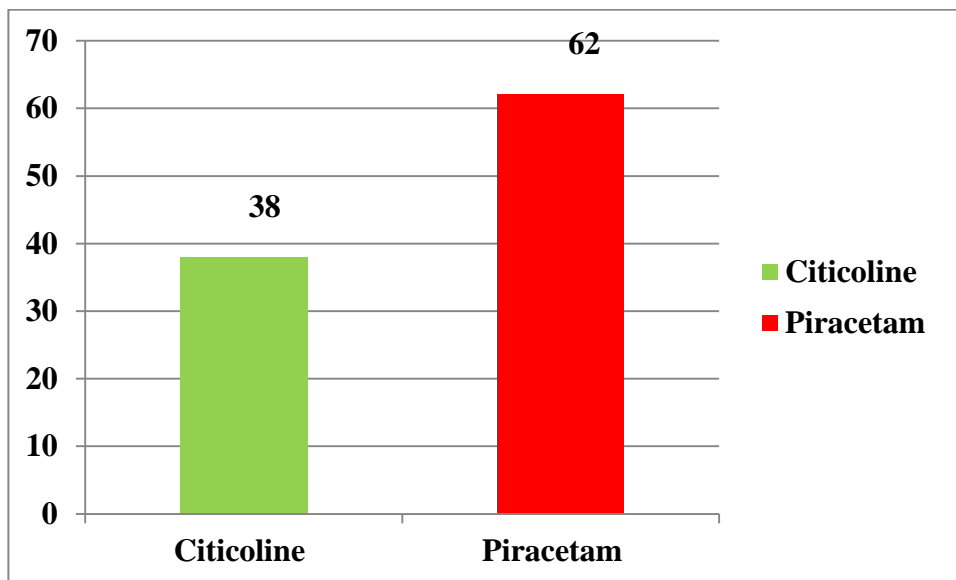


Fig No.7

ASSESSMENT OF PATIENT EDUCATION-QUESTIONNARE TABLES

1) What do you mean by stroke?

Among 61 patients ,in pre test only 40 were given correct answers after the counselling and post test 60 were given correct answers.

Table 10

SL NO	RESPONSE	PRE TEST	POST TEST
1	CORRECT	40	60
2	WRONG	21	1

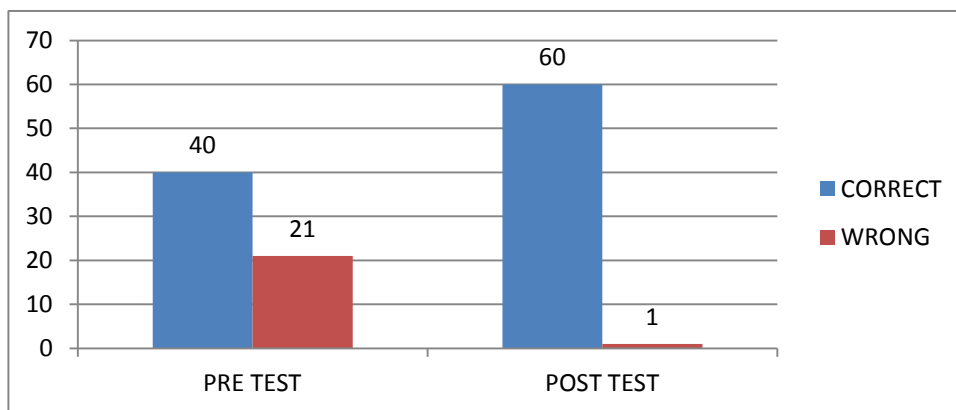


Fig No.8

2) From where do you get the information about stroke ?

Response in this question after counselling were improved in post test.

Table11

SL NO	RESPONSE	PRE TEST	POST TEST
1	CORRECT	4	61
2	WRONG	57	0

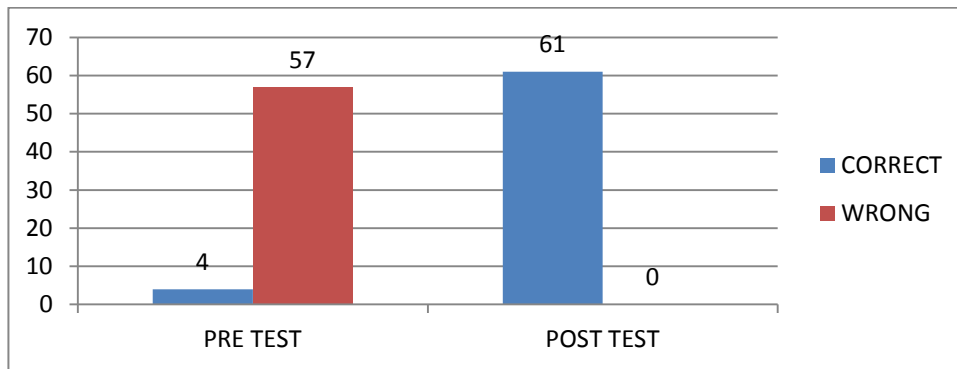


Figure No.9

3) What are the different types of stroke?

In pre test majority of patients were given wrong answers and after the counselling majority of patients were given correct answers.

Table12

SL NO	RESPONSE	PRE TEST	POST TEST
1	CORRECT	3	60
2	WRONG	58	1

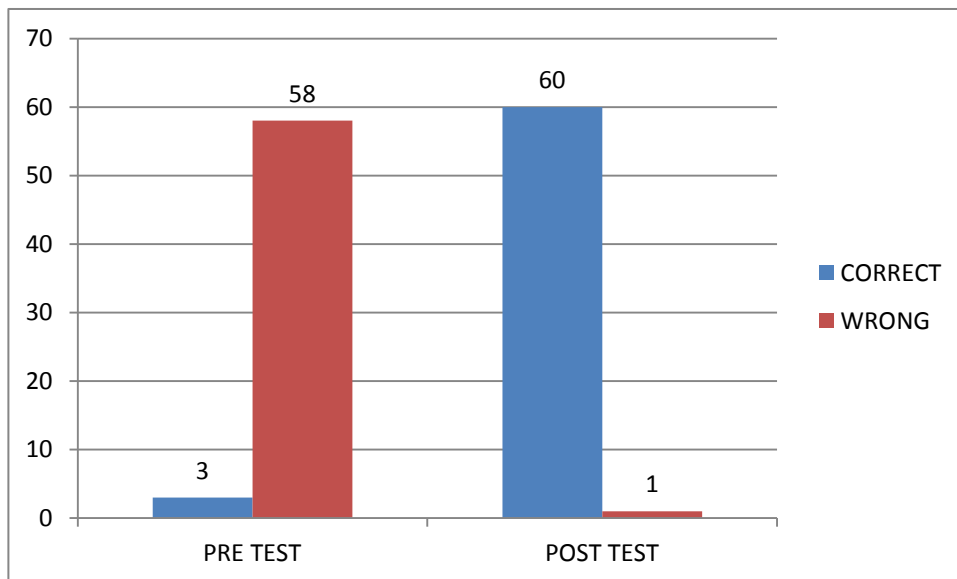


Fig No.10

4) What are the symptoms of stroke ?

In this questionnaire majority of patients bystanders were given answers according to their relatives condition .After the counselling majority of patents were given correct answers. This is depicted in table and figure

Table13

SL NO	RESPONSE	PRE TEST	POST TEST
1	CORRECT	5	59
2	WRONG	56	2

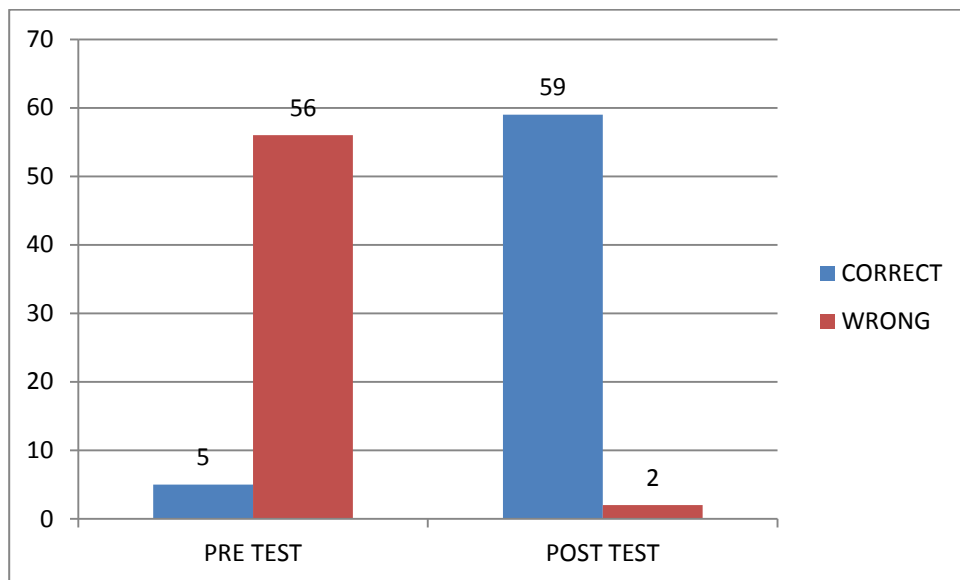


Fig No.11

5) What are the main causes of stroke ?

In this questionnaire a majority of patients, has given the correct answers after the counselling .This is depicted in table and figure

Table 14

SL NO	RESPONSE	PRE TEST	POST TEST
1	CORRECT	3	59
2	WRONG	58	2



Fig No.12

6) RESPONSE FOR THE QUESTION: Are you a

Out of 61 patients majority of patients were both vegetarian and non vegetarian. This questionnaire is used to assess the nutritional status of the patient. According to the given response most of them uses mixed diet which includes veg and non veg.

Table 15

SL NO	RESPONSE	PRE TEST	POST TEST
1	Vegeterian	14	14
2	Non veg	13	13
3.	Mixed	34	34

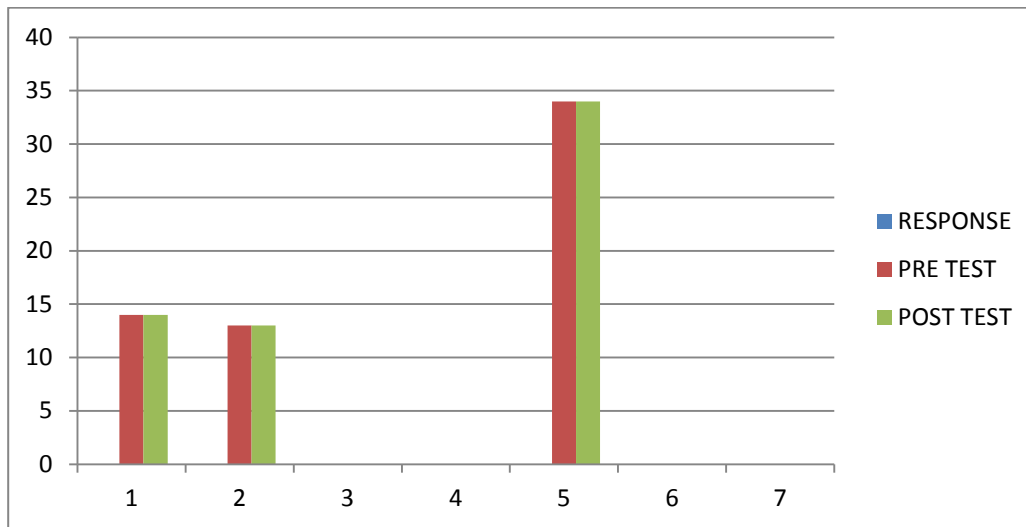


Fig No.13

7) **How often you take leafy vegetables ?**

Out of 61 patients majority of patients took leafy vegetables twice in a week

Table16

SL NO	RESPONSE	PRE TEST	POST TEST
1	Every day	10	10
2	Once a week	18	18
3.	. Twice a week	23	22
4	None of the above	10	10

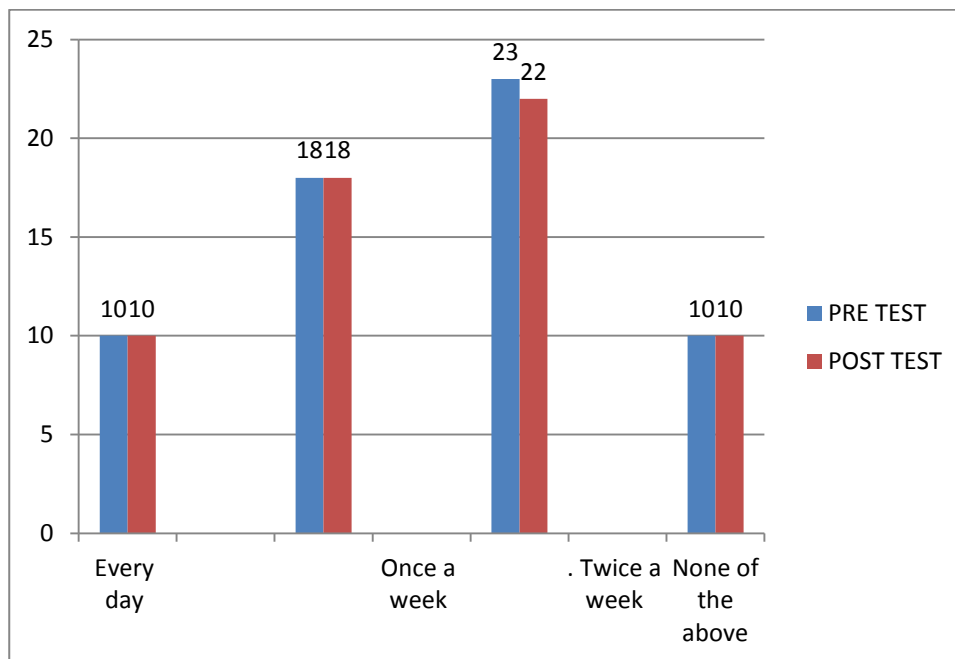


Fig No.14

8) **Howoften you take**

Out of 61 patients majority of patients do not use milk ,curd ,cheese or butter in their diet.

Table 17

SL NO	RESPONSE	PRE TEST	POST TEST
1	Milk	14	15
2	Curd	15	15
3.	Cheese/butter	4	4
4	None of the above	28	27

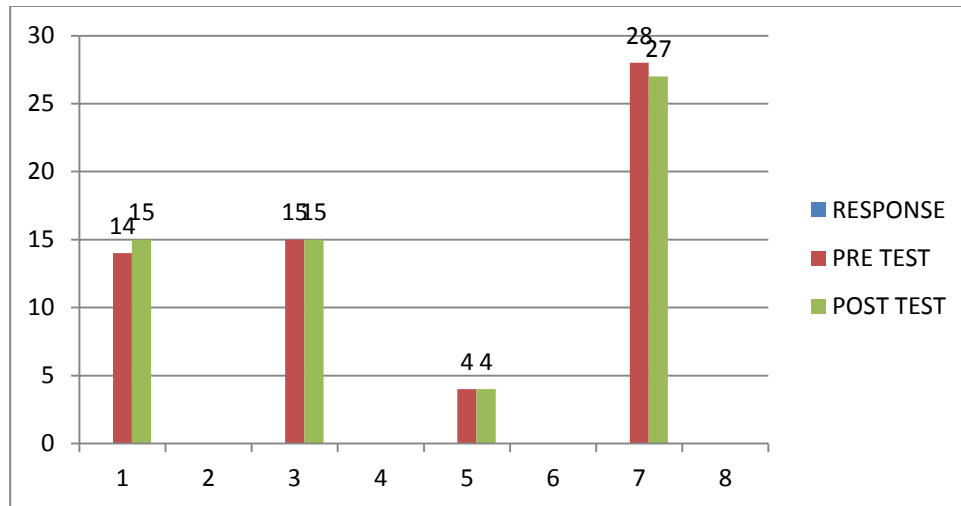


Figure Number 15

9) Have you ever suffered from any of the following conditions ?

Many of the patient bystanders are unaware about the stroke .But after the counselling awareness was increased .This is depicted in table and figure

Table 18

SL NO	RESPONSE	PRE TEST	POST TEST
1	Diabetes Mellitus	14	5
2	High Cholesterol	2	0
3.	Stroke	42	53
4	All of the above	3	3

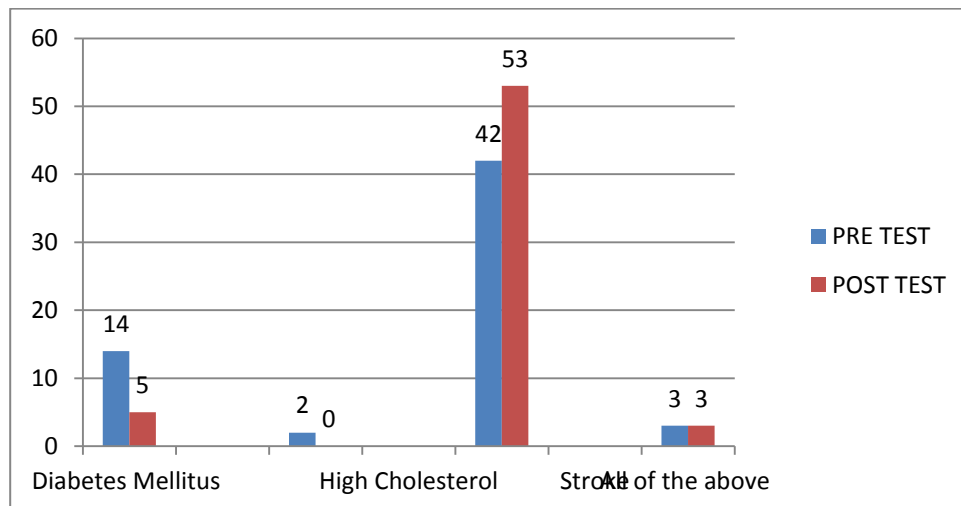


Fig No.16

10) Are you currently taking Aspirin ?

In this questionnaire the knowledge regarding the use of aspirin was improved after the counselling.

Table 19

SL NO	RESPONSE	PRE TEST	POST TEST
1	Yes	5	36
2	No	56	25

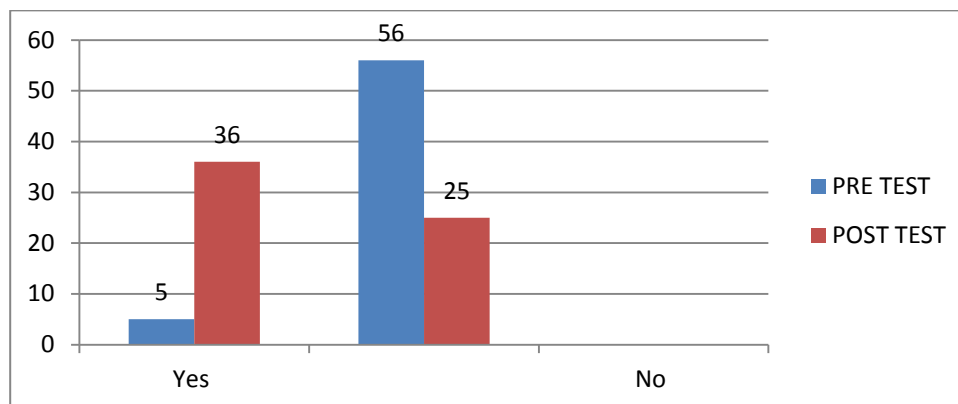


Fig No17

V. CONCLUSION AND FUTURE SCOPE

Result summarizes the overall study data among 122 patients from Intensive Care Unit and the following conclusions were made,

- The prevalence was found to be 50 %.
- Males of ages between 51 – 60 are more prone to stroke
- Hypertension is the other major risk factor that for stroke.
- The most common prescribed drug was found to be anti hypertensives .
- The knowledge regarding disease, diet and life style modification among stroke patients was improved after the patient education.

LIMITATIONS

1. The Sample size of the patients was less due to shorter duration of study period.
2. Classification of stroke was not possible.
3. For those who had a family history of modifiable risk factors, controlling them remains a challenge.
4. Sometimes patients with identified risk factors for stroke do not follow physicians' suggestions regarding lifestyle changes and treatment prescribed to modify their risk(lack of adherence).

FUTURE DIRECTIONS

1. Still much more studies yet to be done on stroke. If we are adopting new treatment guidelines like Constraint Induced Movement Therapy (CIMT), brain stimulation may better the patient condition.
2. Classification of stroke like ischemic and hemorrhagic stroke may easy to assess accurate risk and treatment guidelines for specific type which may benefit the patient condition.
3. Large population will give accurate results on the same topic.

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