International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

Evaluation of Risk Factors in Patients with Ischemic Stroke and Its Short Term Outcome

Dr. Udayan Borborah Dr Indrajit Das
Dept of Medicine
Gauhati Medical College, Guwahati

Date of Submission: 18-11-2021 Date of Acceptance: 01-12-2021

ABSTRACT

Background: Stroke or Cerebro Vascular Accident can also be defined as abrupt onset of neurologic deficit that is attributable to a focal vascular cause. Cerebrovascular accident can be divided into ischemic and hemorrhagic. Ischemic stroke occurs when the blood supply to a part of the brain is suddenly interrupted by vascular occlusion. Hemorrhagic stroke on the other hand results from the rupture of a weakened cerebral blood vessel.There are various risk factors associated with stroke, both non modifiable and modifiable.

Identification of risk factors in patients can provide us clues to the cause of the stroke and help in the treatment and secondary prevention plan. Non modifiable risk factors such as: age, gender, race, hereditary.

Modifiable risk factors include but not limited to hypertension, smoking, hyperlipidemia, heart diseases, diabetes, alcohol consumption, drug abuse etc.

Aim of the study:

To evaluate the risk factors in patients with ischemic stroke and find out the short term outcome of ischemic stroke during hospital stay in relation to risk factors.

Materials and methods:

The article topic entitled "Evaluation of risk factors in patients with ischemic stroke and it's short term outcome" is a hospital based observational study carried out in patients admitted in the Department of General Medicine, Gauhati Medical College & Hospital, Assam. The period of study is from 1st June 2019 to 31st May 2020. Ethical clearance was obtained from the Institutional Ethical Committee, Gauhati Medical College & Hospital, Assam. The present study consists of 149 patients, both males and females, who had been diagnosed with acute ischemic stroke.

Results:

In the present study, 149 patients who have met the selection criteria were enrolled into the study during a period of one year from 1st June 2019 to 31st May 2020. They were analysed with regards to their risk factors and outcome.

Among 149 patients, 83 (55.7%) were male and 66 (44.3%) were females.

Among 149 patients, 39 (26.17%) patients were over 70 years, 52 (34.89%) patients were in the age group of 60-69 years, 39 (26.17%) patients were in the age group of 50-59 years, 12 (8%) patients were in the age group of 40-49 years, 4 (2.6%) patients were in the age group of 30-39 years and 3 (2%) patients were in the age group of 20-29 years.

Among 149 patients, 90 (60.4%) patients had hypertension, 49 (33%) patients had Diabetes Mellitus, 46 (30.8%) patients had Dyslipidemia, 40 (26%) patients were smokers, 23 (15.4%) patients were alcoholic, 18 (12%) patients had past history of stroke, 14 (9.3%) patients had coronary artery disease, 23(15.4%) patients had atrial fibrillation, 13 (8.7%) patients had family history of stroke, 104 (69.79%) had more than one risk factors.

Conclusion:

The prevalence of stroke was more among the elderly population with peak after 60 years. Males were affected more than females.

The most common modifiable risk factors were hypertension, diabetes mellitus, dyslipidemia.Commonest non modifiable risk factors were age, sex and family history of stroke. Hypertension was the most common risk factor and mortality and morbidity associated with ischemic stroke. Proper reforms to be made to identify undiagnosed hypertension and initiate early treatment and also compliance to be checked.It was seen that 12% cases had past history of stroke. So patients with previous history of stroke should be followed regularly and all other risk factors to be modified.Presence of multiple risk factors was related to poor prognosis.

I. INTRODUCTION

The World Health Organization (WHO) definition of stroke is: "rapidly developing clinical signs of focal (or global) disturbance

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin." (Aho et al., 1980)

Stroke or Cerebro Vascular Accident can also be defined as abrupt onset of neurologic deficit that is attributable to a focal vascular cause. (Smith et al., 2018)

The prevalence of stroke ranges from 84–262/100,000 in the rural setting and from 334–424/100,000 in the urban areas in India. The incidence is about 119–145/100,000 based on recent population-based studies. (Pandian and Sudhan, 2013)

According to the World Health Organization (WHO), 15 million people suffer stroke worldwide each year. Of these, 5 million die, and another 5 million are left permanently disabled. (Mackay and Mensah, 2004)

A transient ischaemic attack (TIA) is an acute loss of focal brain or monocular function with symptoms lasting less than 24 hrs and which is thought to the due to inadequate cerebral or ocular blood supply as a result of arterial thrombosis, embolism or low flow, associated with arterial, cardiac or haematological disease. (Warlow, 2001)

The Trial of Org10172 (TOAST) is the most commonly used classification that identifies five subtypes in acute ischemic stroke: 1) large artery atherosclerosis 2) cardio-embolism 3) small vessel occlusion 4) stroke of other determined etiology 5) stroke of undetermined etiology. (Adams Jr et al., 1993)

There have been a vast advancement in the treatment of stroke and in reducing deaths from stroke. The advent of intravenous tissue-type plasminogen activator as a specific treatment for selected patients with acute ischemic stroke in therapeutic window and the promise of other intervention therapies, still the best approach to decrease stroke burden is effective prevention. (Adams Jr et al., 2007)

AIMS AND OBJECTIVES OF THE STUDY

- To evaluate the risk factors in patients with ischemic stroke.
- To find out the short term outcome of ischemic stroke during hospital stay in relation to risk factors.

II. MATERIALS AND METHODS

STUDY DESIGN: Hospital based observational study

SAMPLE SIZE: 149

LOCATION OF STUDY: Gauhati Medical College and hospital, Guwahati (Assam).

SOURCE OF DATA: Patients admitted in the Department of General Medicine, Gauhati Medical College & Hospital, Assam.

PERIOD OF STUDY: The period of study is from 1st June 2019 to 31st May 2020.

ETHICAL CLEARANCE: Ethical clearance was obtained from the Institutional Ethical Committee, Gauhati Medical College & Hospital, Assam.

INCLUSION CRITERIA:

- Patients with clinical evidence of acute loss of focal or global cerebral function.
- Evidence of ischemia in Brain CT scan.
- Age >12 years.

EXCLUSION CRITERIA:

- Age less than 12 years.
- Patients with evidence of haemorrhage in Brain CT scan.
- Patient with history of head injury
- Patients with evidence of structural brain lesion.
- Patients not giving consent for detailed clinical examination.

III. METHODOLOGY:

Patients who fulfilled the selection criteria were enrolled into the study and were subjected to a detailed history and clinical examination. The patients and their attendants were fully informed about the study and their informed consent was taken prior to their participation in the study. In patients having speech disturbances, history was obtained for the attendees. All the patients were clinically examined and investigated routinely as per the protocol of the Department of Medicine for stroke patients.

The data of each patient was collected in the specific proforma which included:

- Patient's name, age , sex, demographic details ,presenting complaints, risk factors, past history, drug history, family history, socioeconomic history.
- General examination
- Vital signs
- System examination
- Morbidity and Mortality reassessment on admission and day 7 using Modified Rankin Scale(MRS).

Outcome Variables: The two main primary outcomes of the study were Mortality and Functional Outcome. Mortality in the study indicated death occurring during the stay in the hospital or within 7 days whichever was earlier.

Functional Outcome on the other hand was assessed using mRS criteria.

To assess the functional outcome of the patients,

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

MRS scoring is done at baseline on admission and on 7th day and are correlated accordingly. This scale runs from 0-6, from perfect health without symptoms to death.

The outcome during the hospital stay was divided as follows:

- Complete recovery: MRS score 0 on 7th day.
- Partial recovery: MRS score decreased from baseline.
- No recovery : MRS score same or increased from baseline.
- Death at any point of time from admission.

MODIFIED RANKIN SCALE (mRS):

- 0 = No symptoms at all.
- 1 = No significant disability despite symptoms; able to carry out all usual
- duties and activities.
- 2 = Slight disability; unable to carry out previous activities, but able to look after own affairs without assistance.
- 3 = Moderate disability; requiring some help, but able to walk without assistance.
- 4 = Moderately severe disability; unable to walk without assistance and unable to attend to own bodily needs without assistance
- 5 = Severe disability; bedridden, incontinent and requiring constant nursing care and attention
- 6 = Dead

IV. RESULTS:

In the present study, 149 patients who have met the selection criteria were enrolled into the study during a period of one year from 1st June 2019 to 31st May 2020. They were analysed with regards to their risk factors and outcome.

SEX:

Among 149 patients, 83 (55.7%) were male and 66 (44.3%) were females.

Male : Female ratio was found to be 1.25:1

Total patients	149	
Male	83	55.7%
Female	66	44.3%

Table 4: Showing sex distribution of patients

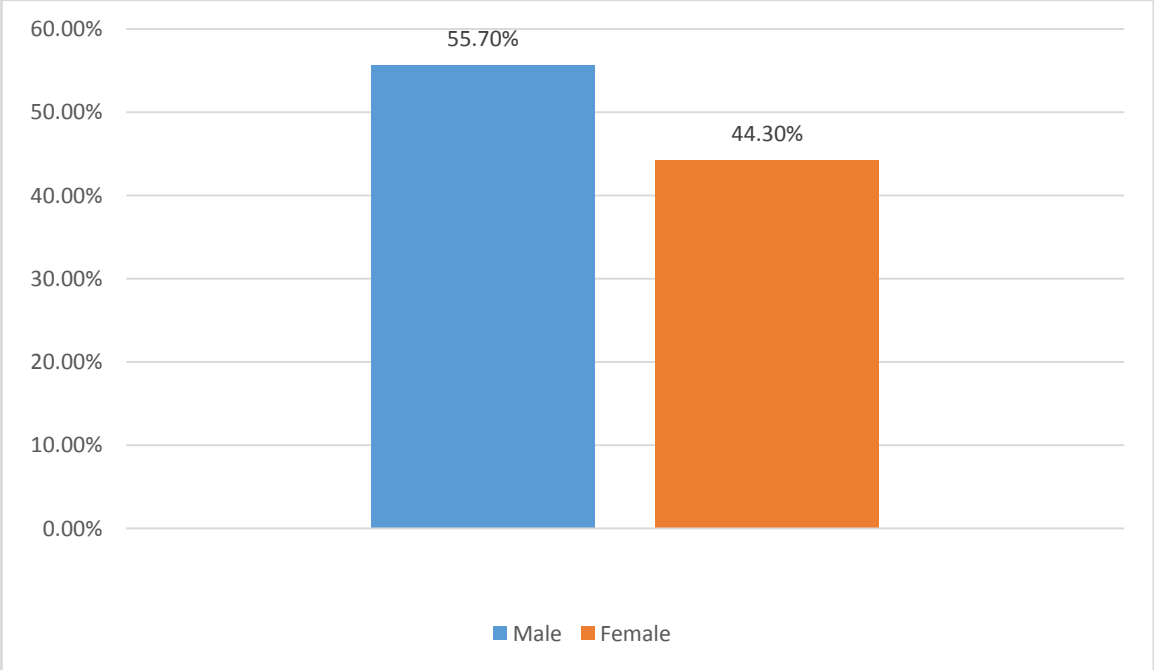

Figure 1: Showing sex distribution of patients

	Death	Complete recovery	Partial recovery	No recovery
Male (83)	12 (14.45%)	10 (12%)	33 (39.75%)	28 (33.7)
Female (66)	11 (16.66%)	6(9.09%)	23 (34.8%)	26 (39.9%)

Table 1: Showing outcome with relation to sex

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

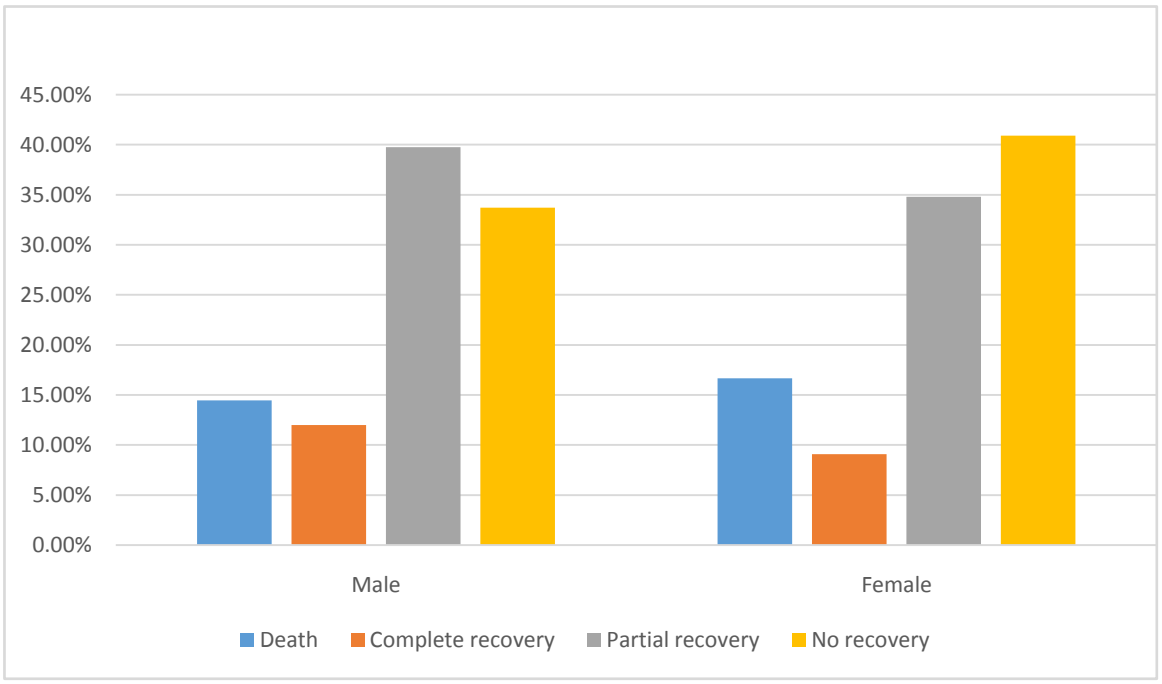

Figure 2: Showing outcome with relation to sex

AGE:

Among 149 patients, 39 (26.17%) patients were over 70 years, 52 (34.89%) patients were in the age group of 60-69 years, 39 (26.17%) patients were in the age group of 50-59 years, 12 (8%) patients were in the age group of 40-49 years, 4 (2.6%) patients were in the age group of 30-39 years and 3 (2%) patients were in the age group of 20-29 years.

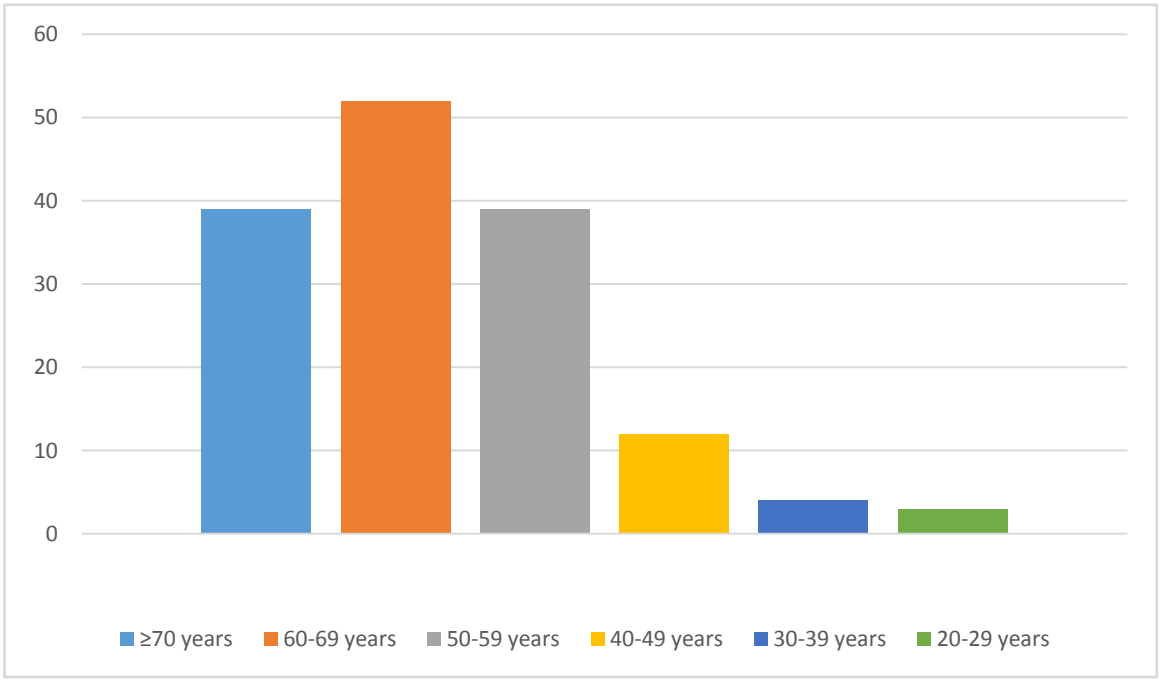

Figure 3: Showing age distribution

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

Age group	Total	Death	Complete recovery	Partial recovery	No recovery
≥70	39 (26.17%)	9 (23%)		8 (20.5%)	22(56.4%)
60-69	52 (34.89%)	8 (15.38%)	9 (17.3%)	16 (30.7%)	19 (36.5%)
50-59	39 (26.17%)	5 (12.8%)	4 (10.25%)	25 (64%)	5 (12.8%)
40-49	12 (8%)	1 (8.3%)	2 (16.6%)	4 (33.3%)	5 (41.06%)
30-39	4 (2.6%)	0	1(25%)	2 (50%)	1 (25%)
20-29	3 (2%)	0	0	1 (33.3%)	2 (66.6%)

Table 2: Showing age distribution and outcome

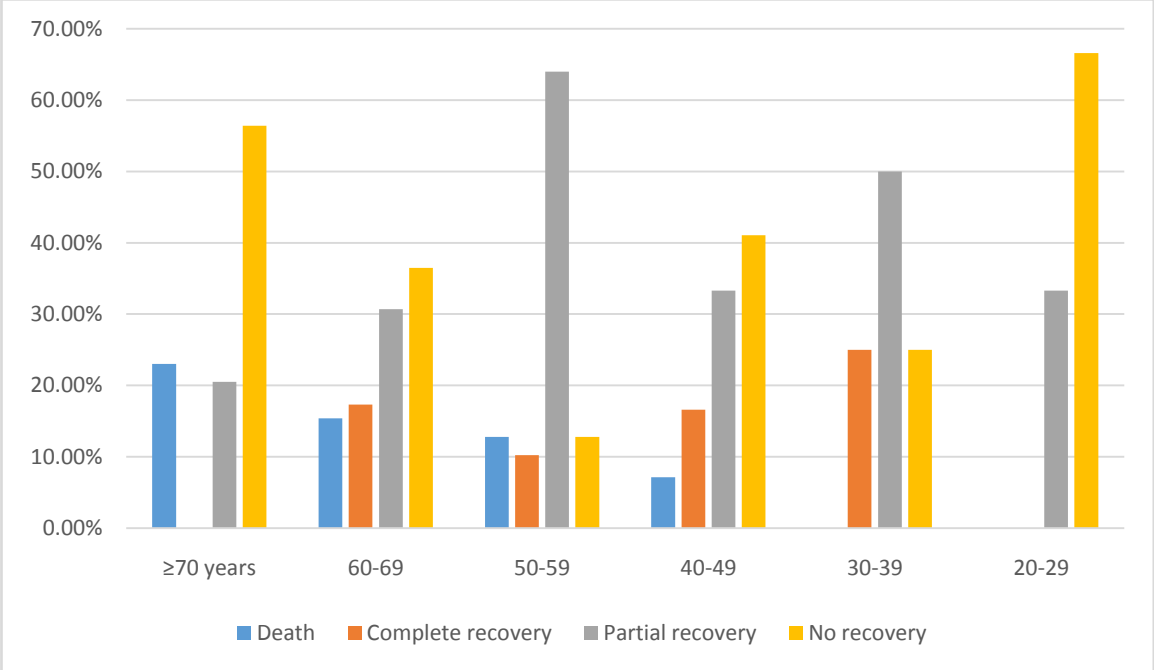

Figure 4: Bar diagram showing age distribution and oucome

Other risk factors:

Among 149 patients, 90 (60.4%) patients had hypertension, 49 (33%) patients had Diabetes Mellitus, 46 (30.8%) patients had Dyslipidemia, 40 (26%) patients were smokers, 23 (15.4%) patients were alcoholic, 18 (12%) patients had past history of stroke, 14 (9.3%) patients had coronary artery disease, 23(15.4%) patients had atrial fibrillation, 13 (8.7%) patients had family history of stroke, 104 (69.79%) had more than one risk factors.

Risk factors	No of patients	Percentage
Hypertension	90	60.4%
Diabetes Mellitus	49	33%
Dyslipidemia	46	30.8%
Smoking	40	26%
Alcohol	23	15.4%
Coronary artery disease	14	9.3%
Atrial Fibrillation	23	15.4%
Past history of stroke	18	12%
Family history of stroke	13	8.7%
Multiple risk factors	104	69.79%

Table 3: Showing presence of risk factors

HYPERTENSION:
Among 149 patients, 90 (60.4%) had hypertension. Out of these 18 (20%) patients expired, 5 (5.5%) patients had complete recovery, 26 (28.8%) patients had partial recovery and 41 (45.5%) patients had no recovery at all.
Out of 59 non hypertensive patient in the study mortality was 5 (8.4%)

	Total	Expired		Complete recovery		Partial recovery		No recovery	
	No.	No.	%	No.	%	No.	%	No.	%
Hypertension	90	18	20%	5	5.5%	26	28.8%	41	45.5%
Non hypertensives	59	5	8.4%	11	18.64%	30	50.8%	13	22.03%

Table 4: Showing outcome in relation to hypertension

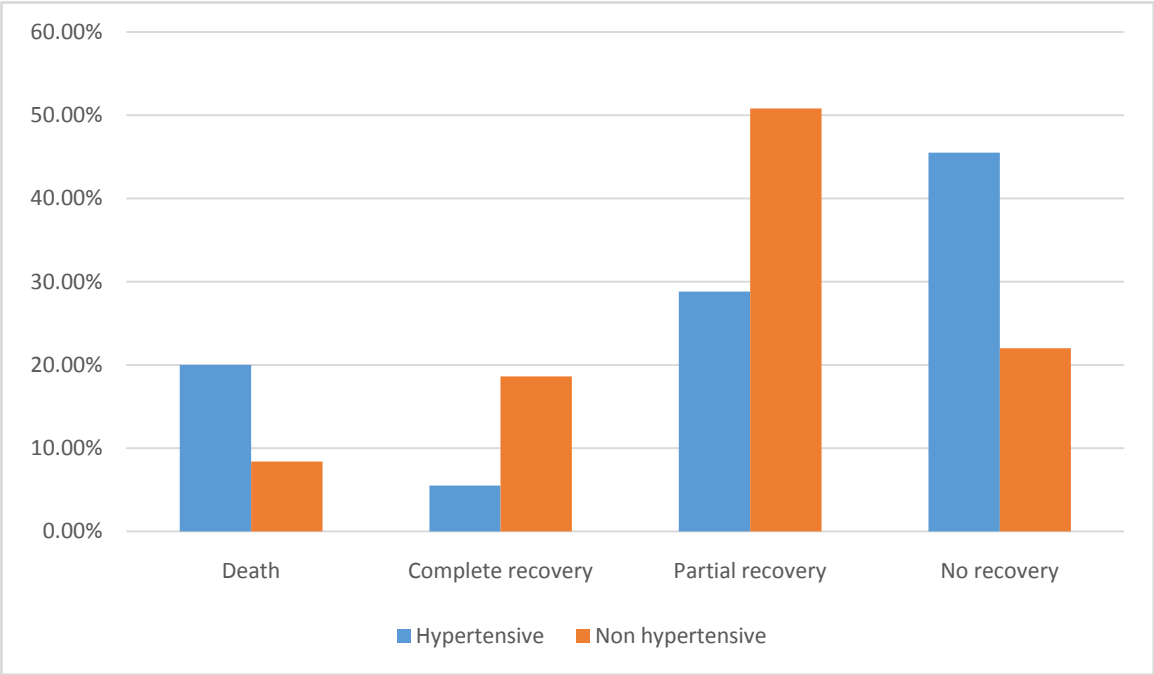

Figure 5: Showing outcome in relation to hypertension

DIABETES MELLITUS:
Out of 149 patients, 49 (33%) had diabetes. Out of them 14 (28.5%) patients expired, 14 (28.5%) had partial recovery and 21 (42.8%) patients had no recovery at all.
Out of 100 non diabetic patient, 9 (9%) expired

	Total	Expired		Complete recovery		Partial recovery		No recovery	
	No.	No.	%	No.	%	No.	%	No.	%
Diabetes mellitus	49	14	28.5%	-	-	14	28.5%	21	42.8%
Non diabetics	100	9	9%	16	16%	42	42%	33	33%

Table 5: Showing outcome in relation to diabetes

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

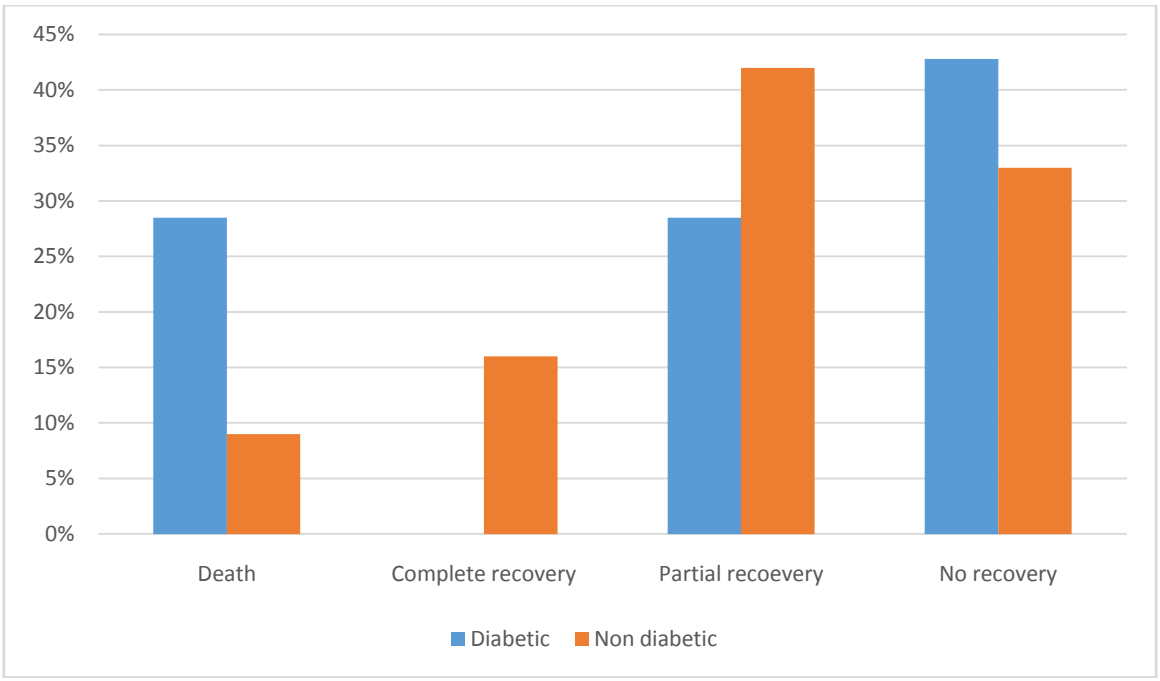

Figure 6: Showing outcome in relation to diabetes

DYSLIPIDEMIA :
Out of 149 patients,46 (30.8%) had dyslipidemia. Out of them 10 (21.7%) patients expired,14 (30.4%) had partial recovery and 22 (47.8%) patients had no recovery at all.
Out of 103 patients who did not had dyslipidemia, 13 (12.6%) expired

	Total	Expired		Complete recovery		Partial recovery		No recovery	
	No.	No.	%	No.	%	No.	%	No.	%
Dyslipidemia	46	10	21.7%	-	-	14	30.4%	22	47.8%
Patient without dyslipidemia	103	13	12.6%	16	15.5%	42	40.7%	32	31%

Table 6: Showing outcome in relation to dyslipidemia.

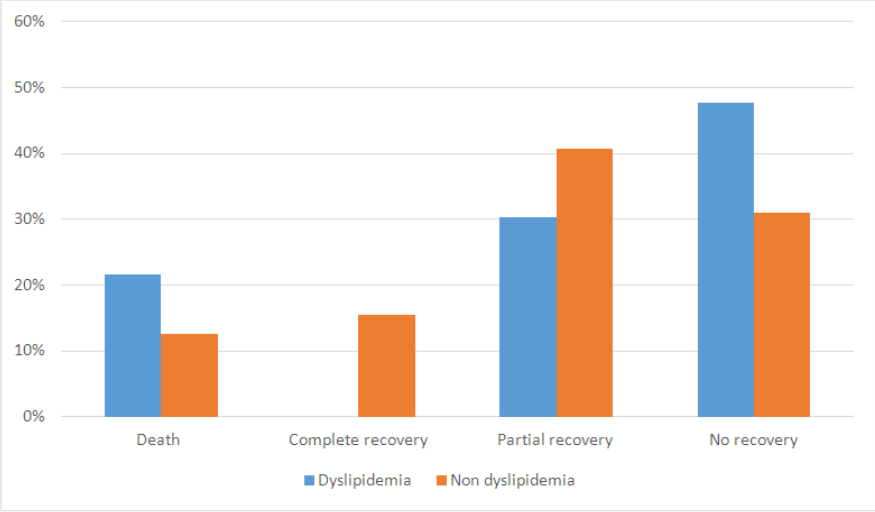

Figure 7: Showing outcome in relation to dyslipidemia

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

SMOKING:
Out of 149 patients, 40 (26%) were smokers. Out of them 7 (17.5%) patients expired, 3 (7.5%) had complete recovery, 12 (30%) had partial recovery and 18 (45%) patients had no recovery at all.
Out of 109 non smokers, death occurred in 16 (14.67%)

	Total	Expired		Complete recovery		Partial recovery		No recovery	
	No.	No.	%	No.	%	No.	%	No.	%
Smoking	40	7	17.5%	3	7.5%	12	30%	18	45%
Non smoker	109	16	14.67%	13	11.92%	44	40.36%	36	33%

Table 7: Showing outcome in relation to smoking

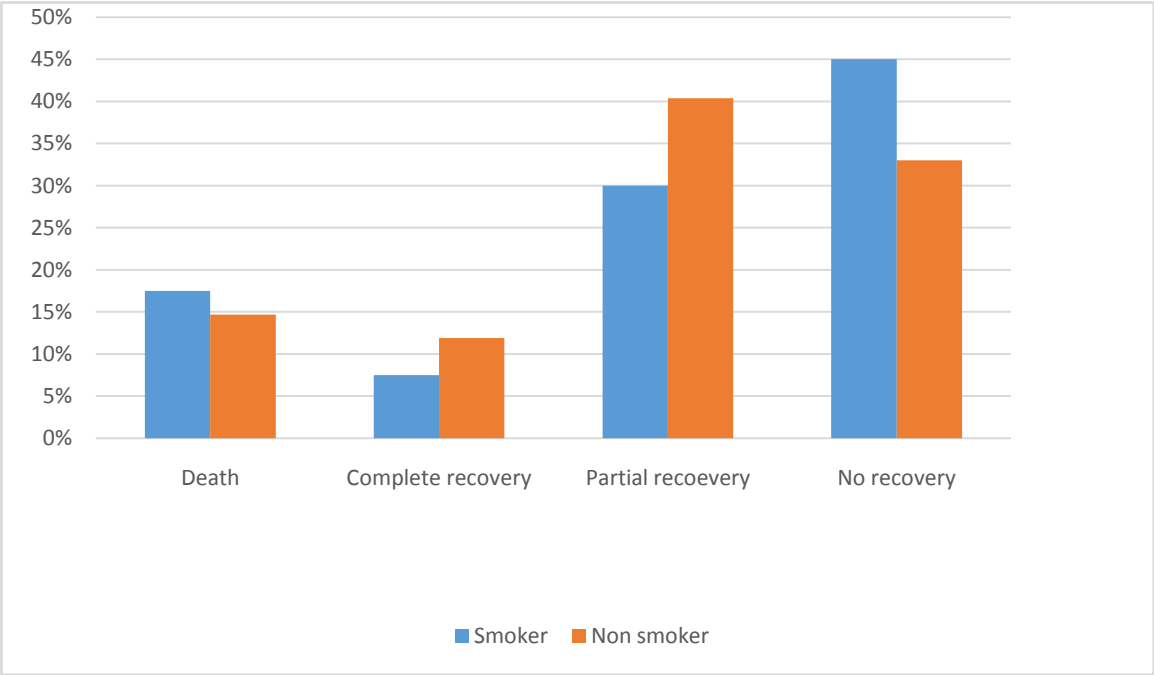

Figure 8: Showing outcome in relation to smoking

ALCOHOL:
Out of 149 patients, 23 (15.4%) were alcoholic. Out of them 6 (26%) patients expired, 2 (8.6%) had complete recovery, 6 (26%) had partial recovery and 9 (39.1%) patients had no recovery at all.
Out of 126 patients who were non alcoholic mortality was 17 (13.44%)

	Total	Expired		Complete recovery		Partial recovery		No recovery	
	No.	No.	%	No.	%	No.	%	No.	%
Alcohol	23	6	26%	2	8.6%	6	26%	9	39.1%
Non alcoholics	126	17	13.44%	14	11.11%	50	39.6%	45	35.7%

Table 8: Showing outcome in relation to consumption of alcohol

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

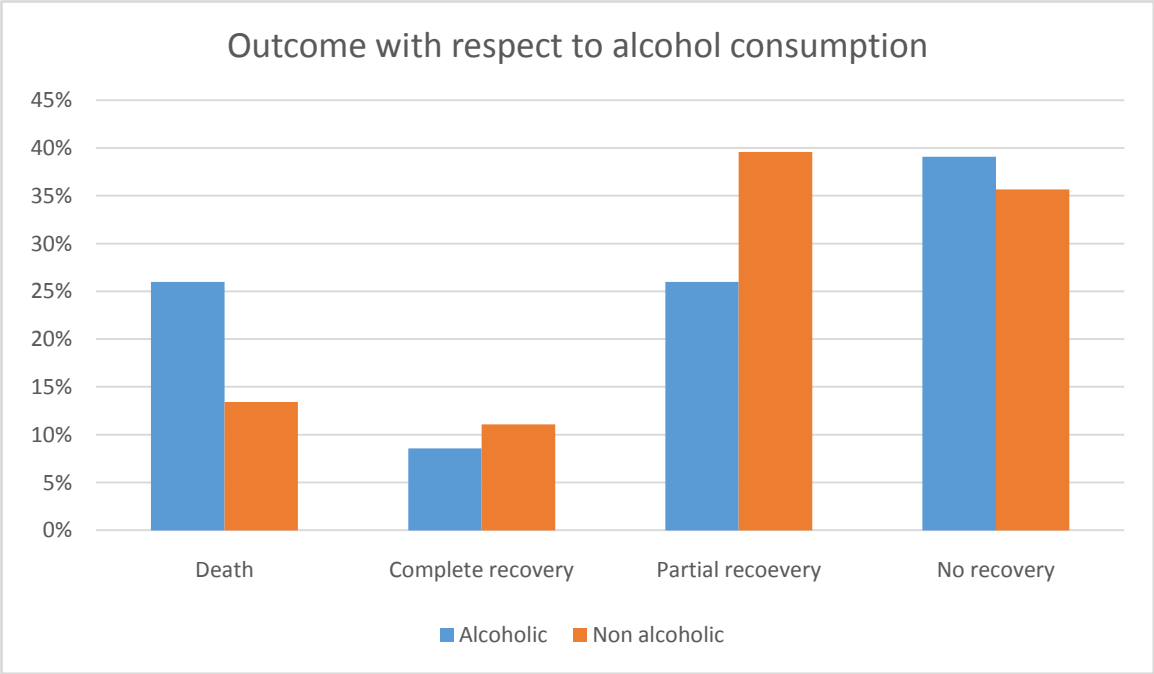

Figure 9: Showing outcome in relation to consumption of alcohol

CORONARY ARTERY DISEASE:
Out of 149 patients, 14 (9.3%) patients had coronary artery disease. Out of them 4 (28.5%) patients expired, 2 (14.28%) had complete recovery, 4 (28.5%) had partial recovery and 4 (28.5%) patients had no recovery at all. Out of 135 patients who did not have coronary artery disease death occurred in 19 (14.07%)

	Total	Expired		Complete recovery		Partial recovery		No recovery	
	No.	No.	%	No.	%	No.	%	No.	%
CAD	14	4	28.5%	2	14.28%	4	28.5%	4	28.5%
Patients without CAD	135	19	14.07%	14	10.37%	52	38.5%	50	37.03%

Table 9: Showing outcome in relation to presence or absence of coronary artery disease

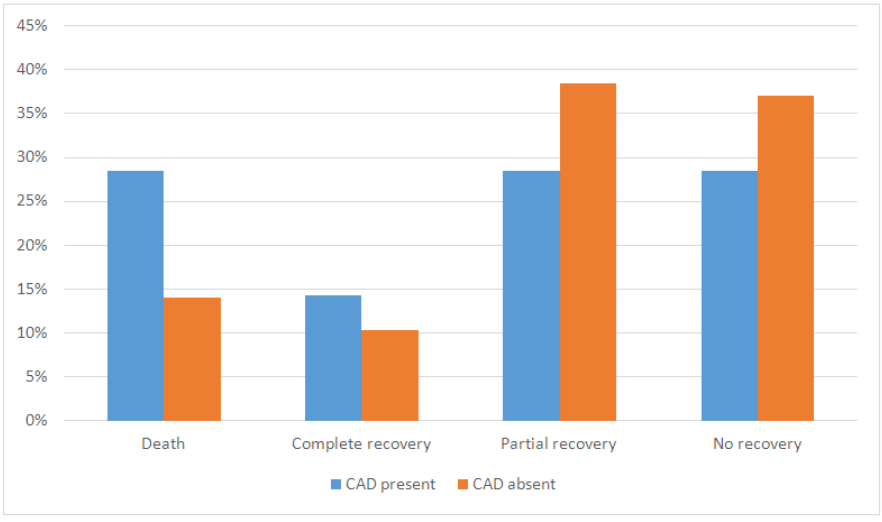

Figure 10: Showing outcome in relation to presence or absence of coronary artery disease

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

ATRIAL FIBRILLATION:
Out of 149 patients, 23 (15.4%) patients had atrial fibrillation. Out of them 5 (21.7%) patients expired, no one had complete recovery, 6 (26%) had partial recovery and 12 (52.17%) patients had no recovery at all.
Out of 126 patients who did not have coronary artery disease death occurred in 18 (14.28%)

	Total	Expired		Complete recovery		Partial recovery		No recovery	
	No.	No.	%	No.	%	No.	%	No.	%
Atrial fibrillation	23	5	21.7%	0	0%	6	26%	12	52.17%
Patients without Atrial fibrillation	126	18	14.28%	16	12.7%	50	39.68%	42	33.3%

Table 10: Showing outcome in relation to atrial fibrillation

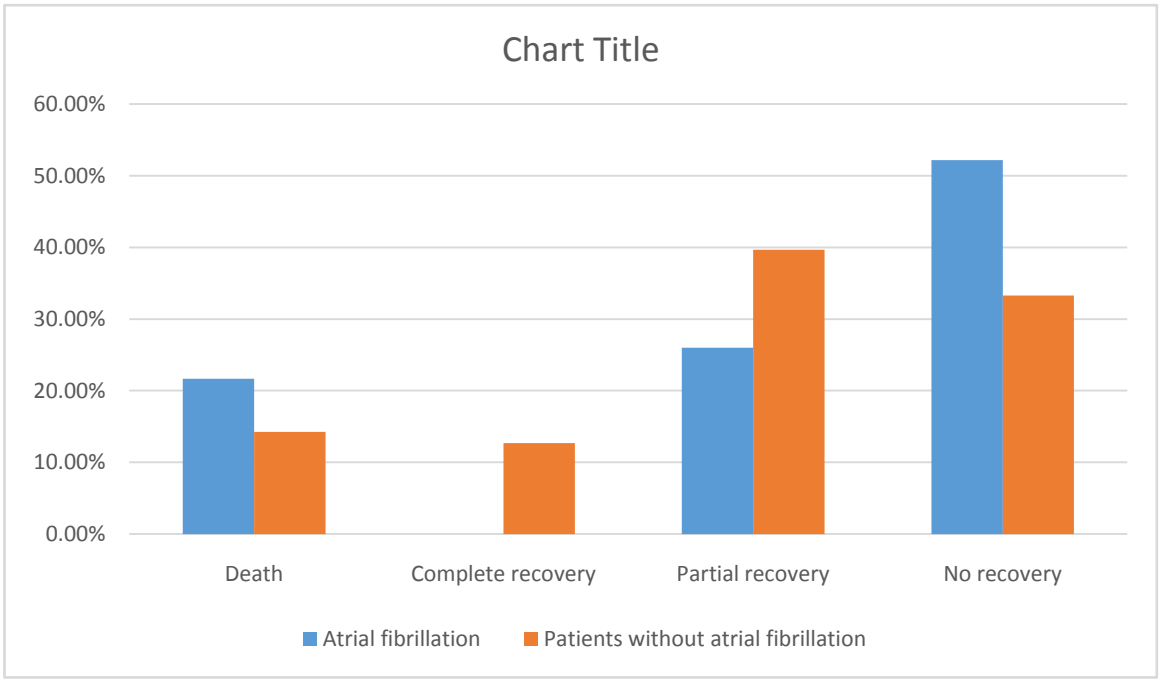

Figure 11: Showing outcome in relation to atrial fibrillation

FAMILY HISTORY OF STROKE :
Out of 149 patients, 13 (8.7%) had family history of stroke. Out of them 7 (53.8%) patients expired, no one had complete recovery, 2 (15.38%) had partial recovery and 4 (30.7%) patients had no recovery at all.
Out of 136 patients who did not have family history of stroke or myocardial infarction death occurred in 16 (11.76%)

	Total	Expired		Complete recovery		Partial recovery		No recovery	
	No.	No.	%	No.	%	No.	%	No.	%
Family h/o stroke	13	7	53.8%		0%	2	15.38%	4	30.7%
Patients without family history of stroke	136	16	11.76%	16	11.76%	54	39.7%	50	36.7%

Table 11: Showing outcome in relation to presence of family history of stroke

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

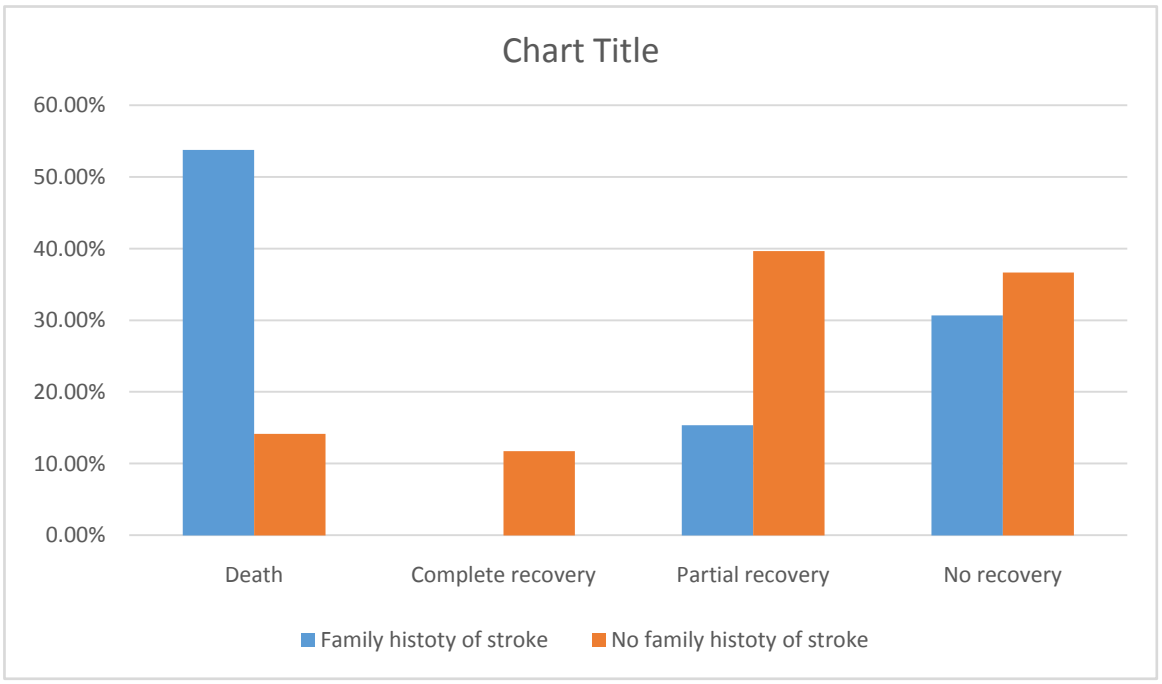

Figure 12: Showing outcome in relation to presence of family history of stroke

PAST HISTORY OF STROKE:
Out of 149 patients, 18 (12%) patients had past history of stroke. Out of them 6 (33.3%) patients expired, no patient had complete recovery, 5 (27.77%) had partial recovery and 7 (38.8%) patients had no recovery at all. Out of 131 patients who did not have prior history of stroke death occurred in 17 (12.9%)

	Total	Expired		Complete recovery		Partial recovery		No recovery	
	No.	No.	%	No.	%	No.	%	No.	%
Past history of stroke	18	6	33.3%	-	-	5	27.7%	7	38.8
Patients without prior past history of stroke	131	17	12.9%	16	12.2%	51	38.9%	47	35.8%

Table 12: Showing outcome in relation to presence of past history of stroke

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

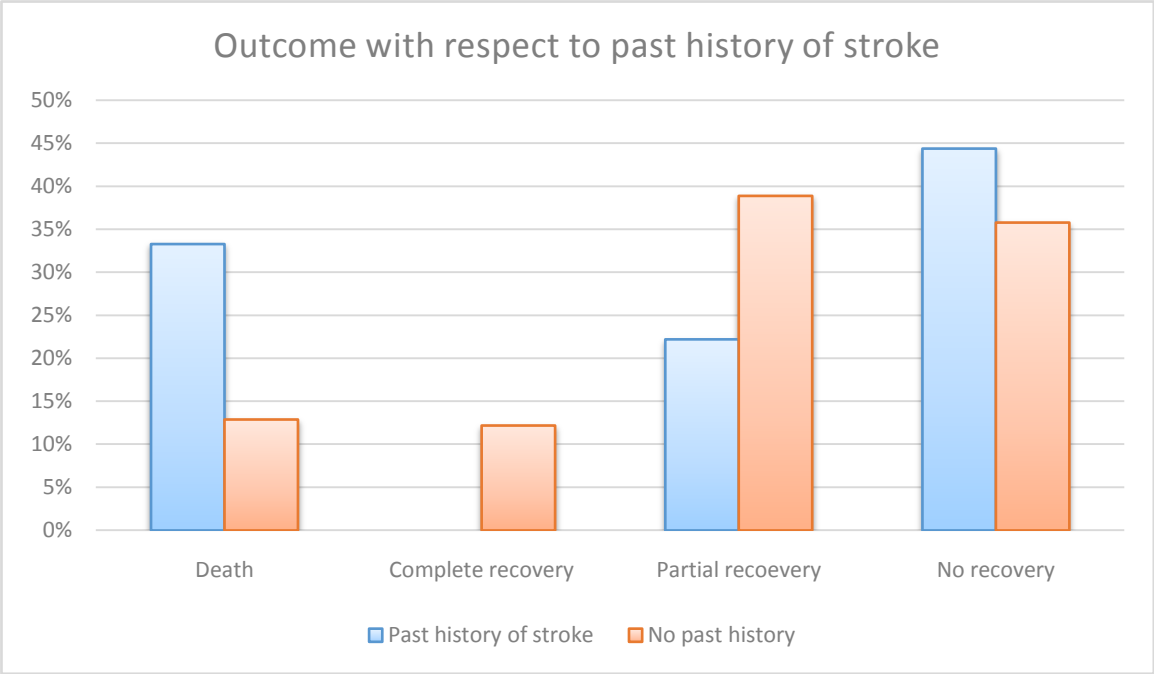

Figure 13: Showing outcome in relation to presence of past history of stroke

MULTIPLE RISK FACTORS:

Among 149 patients, 104 patients (69.79%) patients had multiple risk factors like age more than 60 years, hypertension, diabetes, dyslipidemia, smoking, alcohol intake, history of prior stroke, family history of stroke, coronary artery disease, atrial fibrillation etc.

Out of this, 19 patients (18.8%) expired, 45 (43.26%) patients had no recovery, 35 (33.6%) patients had partial recovery and 5 patients (4.8%) had complete recovery.

	Total	Expired		Complete recovery		Partial recovery		No recovery	
	No.	No.	%	No.	%	No.	%	No.	%
Multiple risk factors	104	19	18.8%	5	4.8%	35	33.6%	45	43.26%
Patients with ≤1 risk factor	45	4	8.8%	11	24.4%	21	46.6%	9	20%

Table 13: Showing outcome in relation to presence of multiple risk factors

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

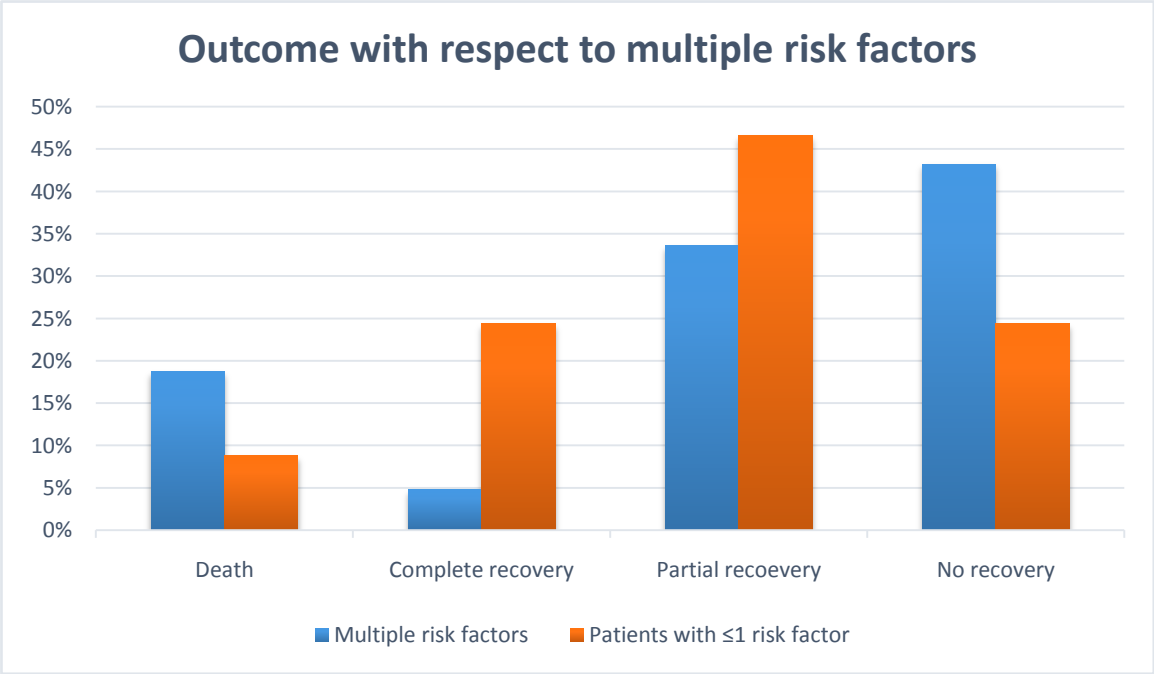

Figure 14: Showing outcome in relation to presence of multiple risk factors

COMPARISION OF RISK FACTORS IN RELATON TO MORTALITY:

Risk factors	Survivors (n=23)	Non-survivors (n=126)
Hypertension	18 (78.2%)	72 (57.14%)
Diabetes mellitus	14 (60.8%)	35 (27.7%)
Dyslipidemia	10 (43.4%)	36 (28.57)
Smoker	7 (30.4%)	33 (26.19%)
Alcohol intake history	6 (26%)	17 (13.4%)
Coronary artery disease	4 (17.3%)	10 (7.9%)
Atrial fibrillation	5 (21.7%)	18 (14.28%)
Family history of stroke	7 (30.4%)	6 (4.7%)
Past history of stroke	6 (26%)	12 (9.5%)
Multiple risk factors	19 (82.6%)	85 (67.46%)

Table 14: Patient's risk factors in survivors and non survivors.

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, pp: 1463-1481www.ijdmsrjournal.com ISSN: 2582-6018

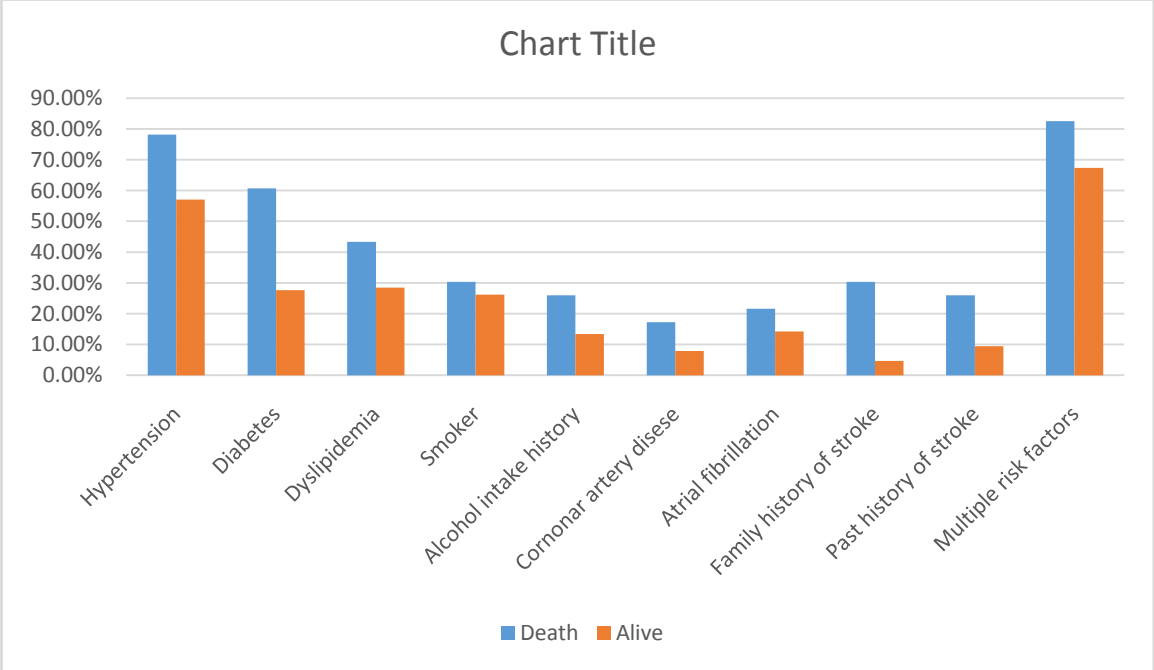

Figure 15: Patient's risk factors in dead and alive population

V. DISCUSSION:

In our study, 149 patients were studied who were admitted in our institution from a period of 1st June, 2019 to 31st May 2020 and evaluated their risk factors and also the outcome in relation to the risk factors both modifiable and non modifiable such as age, sex, hypertension, diabetes, dyslipidemia, smoking, alcohol intake, past history of stroke, family history of stroke, coronary artery disease, atrial fibrillation etc. It was found to be more or less consistent with earlier studies.

SEX:

Study	Ratio
(Dalal et al., 2008)	1.1:1
(Baidya, 2015)	1.29:1
(Zhang et al., 2011)	1.5:1
(Vaidya and Majmudar, 2015)	1.6:1
(Tan et al., 2014)	1.8:1
Present study	1.25:1

Table 15: Comparing sex ratio with previous studies

AGE:

Mean age of patient in our study was found to be 61 years, that was consistent with (Vaidya and Majmudar, 2015): 60.2 yrs and (Yao et al., 2012): 68 yrs .

It was seen that among 149 patients, 39 (26.17%) patients were over 70 years, 52 (34.9%) patients were in the age group of 60-69 years i.e majority of the cases 91 (61%) was above 60 years of age which is more or less consistent with previous study of (Shah et al., 2017) where cases over 60 years was 71%.

In the age group of over 70 years, 9 (23%) patients expired and in the age group of 60-69 years, 8 (15.38%) patients expired. Hence, it is seen that17 (38.38%) patients above 60 years which implies that advancing age is a risk factor for ischemic stroke and has a poor outcome.

HYPERTENSION:

Study	Result
(Tan et al., 2014)	47.2%
(Nayak et al., 2016)	70%
(Zhang et al., 2011)	75%
(Baidya, 2015)	68%
Present study	60.4%

Table 16: Comparing presence of hypertension with previous studies

DIABETES:

Study	Result
(Tan et al., 2014)	24.3%
(Baidya, 2015)	37%
(Zhang et al., 2011)	31%
Present study	33%

Table 17: Comparing presence of diabetes with previous studies

SMOKING:
In the study 40 (26%) were smokers. This was found to be consistent with (Zhang et al., 2011)

Study	Result
(Tan et al., 2014)	38.9%
(Zhang et al., 2011)	23.3%
Present study	26%

Table 18:Comparing smoking history with previous studies

ALCOHOL:
In this study, 23 (15.4%) were alcoholic which is found to be more or less consistent with earlier studies as discussed below. A major limitation in the study was that amount of alcohol consumed could not be specified.

Study	Result
(Zhang et al., 2011)	15.9%
(Vaidya and Majmudar, 2015)	6.5%
(Tan et al., 2014)	15.1%
(Nayak et al., 2016)	11%
Present study	15.4%

Table 19: Comparing alcohol consumption history with previous studies

DYSLIPIDEMIA:
In the present study 46 (30.8%) had dyslipidemia.

Study	Result
(Tan et al., 2014)	42.6
(Basri et al., 2003)	31.3%
Present study	30.8%

Table 20: Comparing presence of dyslipidemia with previous studies

FAMILY HISTORY OF STROKE

13 (8.72%) had family history of stroke. It was more or less consistent with previous studies.

(Zhang et al., 2011)	9.8%
(Tan et al., 2014)	5.5%
Present study	8.72%

Table 21: Comparing presence of family history of stroke with previous studies

CORONARY ARTERY DISEASE

Study	
(Zhang et al., 2011)	16.67%
(Roquer et al., 2007)	13.1%
Present study	9.3%

Table 22: Comparing presence of coronary artery disease with previous studies

ATRIAL FIBRILATION

Among 149 patients, 23 (15.4%) had atrial fibrillation. It was comparable to the study of (Saposnik et al., 2013) (17.2%)

In this study, a major limitation was that patients were not segregated among those who were in anticoagulation prophylaxis or not.

(Saposnik et al., 2013)	17.2%
(Morgenstern et al., 2013)	14.9%
Present study	15.4%

Table 23: Comparing presence of atrial fibrillation with previous studies

PAST HISTORY OF STROKE

Among 149 patients 18 (12%) patients had past history of stroke. It was found to be highly variable due to different rates of follow up and risk factor modification among patients with past history of stroke.

Study	
(Basri et al., 2003)	15.3%
(Nayak et al., 2016)	6%
Present study	12%

Table 24: Comparing presence of past history of stroke with previous studies

MULTIPLE RISK FACTORS

Out of 149 patients, 104 patients (70%) patients had multiple risk factors. It was comparable with study of (Ong et al., 2016) where multiple risk factors was found to be 78 %

Study	
(Ong et al., 2016)	78%
Present study	70.46%

Table 25: Comparing presence of multiple risk factor with previous studies

IN HOSPITAL MORBIDITY :

Risk factors	Partial recovery	No recovery	Total morbidity
Age (>70 years)	20.5%	56.4%	76.9%
Male	39.75%	33.7%	73.5%

Female	34.8%	39.9%	74.7
Hypertension	28.8%	45.5%	74.3%
Diabetes Mellitus	25.5%	42.8%	71.3 %
Dyslipidemia	30.4%	47.8%	78.2%
Smoking	30%	45%	75%
Alcohol	26%	39%	65%
CAD	28.2%	28.2%	57%
Atrial Fibrillation	26%	57.17%	83%
Past history of stroke	27.7%	38.8%	66.5%
Family history of stroke	15.38%	30.7%	46%
Multiple risk factors	43.26%	33.6%	76.9%

Table 26: Showing morbidity in relation to risk factors

IN HOSPITAL MORTALITY:

Risk factors	Non-survivors (N=23)	(Kortazar- Zubizarreta et al., 2019)	(Ong et al., 2016)	(Nedeltchev et al., 2010)
Hypertension	18 (78.2%)	70.21%	82.5%	80%
Diabetes mellitus	14 (60.8%)		46.3%	
Dyslipidemia	10 (43.4%)		41.3%	54%
Smoker	7 (30.4%)	25.5%		23%
Alcohol intake history	6 (26%)			
Coronary artery disease	4 (17.3%)	14.89%		
Family history of stroke	7 (30.4%)			38%
Past history of stroke	6 (26%)	34%	31.3%	
Multiple risk factors	19(82.6%)			
Atrial fibrillation	5 (21.7%)	22.3% (Saposnik et al., 2013)		

Table 27: Comparing mortality in relation to risk factors with previous studies

VI. CONCLUSION:

The thesis topic " Evaluation of risk factors in patients with ischemic stroke and it's short term outcome" was undertaken in the Department of General Medicine, GMCH for a period of 1 year from 31st June 2019 to 1st May 2020.

The following salient features have been noted during the study-

- Out of 149 patients, 23 expired.
- Male : Female ratio was found to be 1.25:1
- Mortality was more or less similar in both groups with 14.45% and 16.66% in male and female respectively.
- Majority of the cases (61%) were above 60 years of age and high mortality was seen in this group.
- It was seen that patients with low GCS score and high MRS score at presentation had bad prognosis and also higher GCS score at presentation reflecting favourable outcome on day 7 assessed by Modified Rankin scale.
- Among all risk factors, 60.4% patients were hypertensive, 33% patients had Diabetes Mellitus, 30.8% patients had Dyslipidemia, 12% patients had past history of stroke, 9.3% patients had coronary artery disease, 15.4% patients had atrial fibrillation, 8.7% patients had family history of stroke, 69.79% had more than one risk factors.
- 26% cases were smokers and 15.2% had history of consumption of alcohol.
- Among patients that expired, 78.2 % were hypertensives, 60.8% had diabetics, 43.4% had dyslipidemia, 30.4% were smokers, 26% had history of alcohol intake, 17.3% had coronary artery disease, 21.7% had atrial fibrillation, 30.4% had family history of stroke, 26% had past history of stroke, 82.6% had multiple risk factors.
- Out of 23 cases that expired, 19 (82.6%) had more than one risk factors.

BIBLIOGRAPHY

[1]. Adams Jr, H.P., Bendixen, B.H., Kappelle, L.J., Biller, J., Love, B.B., Gordon, D.L. and Marsh 3rd, E.E., 1993. Classification of subtype of

acute ischemic stroke. Definitions for use in a multicenter clinical trial. TOAST. Trial of Org 10172 in Acute Stroke Treatment. stroke, 24(1), pp.35-41.

[2]. Adams Jr, H.P., Del Zoppo, G., Alberts, M.J., Bhatt, D.L., Brass, L., Furlan, A., Grubb, R.L., Higashida, R.T., Jauch, E.C., Kidwell, C. and Lyden, P.D., 2007. Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups: the American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists. Stroke, 38(5), pp.1655-1711.Aggarwal, A. et al. (2010) 'Cerebral ischemic stroke: sequels of cascade', International Journal of Pharma and Bio Sciences, 1(3), pp. 1–24.

[3]. Aho, K., Harmsen, P., Hatano, S., Marquardsen, J., Smirnov, V.E. and Strasser, T., 1980. Cerebrovascular disease in the community: results of a WHO collaborative study. Bulletin of the World Health Organization, 58(1), p.113.

[4]. Baidya, O. P. (2015) 'Acute ischemic stroke in young adults-a hospital based study in North

[5]. Chobanian, A.V., Bakris, G.L., Black, H.R., Cushman, W.C., Green, L.A., Izzo Jr, J.L., Jones, D.W., Materson, B.J., Oparil, S., Wright Jr, J.T. and Roccella, E.J., 2003. Seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure. hypertension, 42(6), pp.1206-1252.

[6]. Dalal, P.M., Malik, S., Bhattacharjee, M., Trivedi, N.D., Vairale, J., Bhat, P., Deshmukh, S., Khandelwal, K. and Mathur, V.D., 2008. Population-based stroke survey in Mumbai, India: incidence and 28-day case fatality. Neuroepidemiology, 31(4), pp.254-261.

[7]. Kortazar- Zubizarreta, I., Pinedo- Brochado, A., Azkune- Calle, I., Aguirre- Larracoechea, U., Gomez- Beldarrain, M. and Garcia- Monco, J.C., 2019. Predictors of in- hospital mortality after ischemic stroke: A prospective, single- center study. Health science reports, 2(4), p.e110.

[8]. Mackay, J. and Mensah, G. A. (2004) The atlas of heart disease and stroke. World Health Organization.

[9]. Morgenstern, L.B., Smith, M.A., Sanchez, B.N., Brown, D.L., Zahuranec, D.B., Garcia, N., Kerber, K.A., Skolarus, L.E., Meurer, W.J., Burke, J.F. and Adelman, E.E., 2013. Persistent ischemic stroke disparities despite declining incidence in Mexican Americans. Annals of neurology, 74(6), pp.778-785.

[10]. Nayak, A.R., Badar, S.R., Lande, N., Kawle, A.P., Kabra, D.P., Chandak, N.H., Raje, D.V., Singh, L.R., Daginawala, H.F. and Kashyap, R.S., 2016. Prediction of outcome in diabetic acute ischemic stroke patients: a hospital-based pilot study report. Annals of neurosciences, 23(4), pp.199-208.

[11]. Nedeltchev, K., Renz, N., Karameshev, A., Haefeli, T., Brekenfeld, C., Meier, N., Remonda, L., Schroth, G., Arnold, M. and Mattle, H., 2010. Predictors of early mortality after acute ischaemic stroke. Swiss medical weekly, 140(17-18), pp.254-259.

[12]. Ong, C.T., Sung, S.F., Wong, Y.S., Wu, C.S., Hsu, Y.C., Su, Y.H., Li, C.H. and Hung, L.C., 2016. Risk factors for in-hospital mortality among ischemic stroke patients in southern Taiwan. International Journal of Gerontology, 10(2), pp.86-90.

[13]. Pandian, J. D. and Sudhan, P. (2013) 'Stroke epidemiology and stroke care services in India', Journal of stroke, 15(3), p. 128.

[14]. Roquer, J., Ois, A., Rodríguez-Campello, A., Gomis, M., Munteis, E., Jiménez-Conde, J., Cuadrado-Godia, E. and Martinez-Rodriguez, J.E., 2007. Atherosclerotic burden and early mortality in acute ischemic stroke. Archives of neurology, 64(5), pp.699-704.

[15]. Saposnik, G., Gladstone, D., Raptis, R., Zhou, L. and Hart, R.G., 2013. Atrial fibrillation in ischemic stroke: predicting response to thrombolysis and clinical outcomes. Stroke, 44(1), pp.99-104.

[16]. Smith, W.S., Johnston, S.C., Hemphill, J.C., (2018) 'Cerebrovascular Diseases', Harrison's principles of Internal Medicine, 20th edition: McGraw Hill Education, pp 3068-3091.

[17]. Vaidya, C. V. and Majmudar, D. K. (2015) 'A clinical study of ischemic stroke from capital of Gujarat, India', Sahel Medical Journal, 18(4), p. 177.

[18]. Warlow, C. (2001) 'Stroke, transient ischaemic attacks and intracranial venous thrombosis', Brain's Diseases of the Nervous System, pp. 775–896.

[19]. Yao, X.Y., Lin, Y., Geng, J.L., Sun, Y.M., Chen, Y., Shi, G.W., Xu, Q. and Li, Y.S., 2012. Age-and gender-specific prevalence of risk factors in patients with first-ever ischemic

stroke in China. Stroke Research and Treatment, 2012.

[20]. Zhang, J., Wang, Y., Wang, G.N., Sun, H., Sun, T., Shi, J.Q., Xiao, H. and Zhang, J.S., 2011. Clinical factors in patients with ischemic versus hemorrhagic stroke in East China. World journal of emergency medicine, 2(1), p.18.