



RETROSPECTIVE STUDY ON CLINICAL OUTCOME OF STROKE IN RELATION TO ADMISSION DAY GLYCEMIC STATUS IN A TERTIARY CARE HOSPITAL

Dr. Raghavendra L

Associate Professor, Department of General Medicine, Mandya Institute of Medical Sciences, Mandya, Karnataka

Dr. Mohit A Kalyankar*

Junior Resident, Department of General Medicine, Mandya Institute of Medical Sciences, Mandya, Karnataka *Corresponding Author

Dr. Yuvashri M

Junior Resident, Department of Anaesthesia, Mandya Institute of Medical Sciences, Mandya, Karnataka

ABSTRACT

Stroke or cerebrovascular accident is an abrupt onset of a neurological deficit lasting for more than 24hrs that is attributable to a focal vascular cause. Hyperglycemia and stroke appear to be related in two ways. First incidence of stroke is known to be higher in diabetics than non diabetics. Second it has been suggested that even in non diabetics relatively mild degree of hyperglycemia early in stroke might increase infarct size and lead to poor prognosis. A record based retrospective study was conducted at a tertiary care hospital to determine the admission day glycemic status of patients with cerebrovascular accident and to record the outcome. Datas of 30 patients admitted with cerebrovascular accident in the past year was obtained and analysed for demographic and clinical features. It was observed that hyperglycemia was noticed in 63% of patients in general and hyperglycaemia is positively associated with poor functional outcome. Hence, there is an urgent need to confirm the improvement in these patients by normalizing blood sugar.

KEYWORDS : Stroke, Hyperglycemia, Outcome

Introduction And Need For Study

Among all the neurological diseases of adult life, Cerebrovascular accidents rank first in the frequency of importance¹. Stroke or cerebrovascular accident is an abrupt onset of a neurological deficit lasting for more than 24hrs that is attributable to a focal vascular cause².

At least 50% percent of neurological diseases in general hospitals are due to stroke³. A study by the world health organisation says that the incidence of stroke in India is around 130 per 100000 every year³.

Cerebrovascular accident includes ischemic stroke, hemorrhagic stroke, and cerebrovascular anomalies such as intracranial aneurysm, AV malformation, and cortical venous thrombosis⁴. With the introduction of effective treatment for hypertension, there has been a marked reduction in the frequency of stroke⁵.

Diabetes mellitus by its association with microvascular and macrovascular disease is an important risk factor in the genesis of stroke⁶. It is associated with 1.8 to 6 fold increased risk compared with non diabetic subjects and worsens survival of patients with stroke⁷.

Hyperglycemia and stroke appear to be related in two ways. First incidence of stroke is known to be higher in diabetics than non diabetics. Second it has been suggested that even in non diabetics relatively mild degree of hyperglycemia early in stroke might increase infarct size and lead to poor prognosis.

Stress hyperglycemia defined as hyperglycemia during acute process, mirrors the severity and outcome of critical illness. Hyperglycemia predicts higher mortality and morbidity after acute stroke more so in patients without the prior history of diabetes^{8,9,10}.

Hyperglycemia occurs in 20-40% of patients with stroke, and is associated with worse functional outcome, longer hospital stay, higher medical costs and an increased risk of death¹¹.

Hypertension is common in diabetes and accelerates atherosclerosis which promotes intracranial small vessel disease and heart disease leading to lacunar and embolic

infarction respectively¹². Ischemic stroke, which includes TIA, is the most common type of stroke is a blockage that cuts off blood supply to affected parts of the brain. Ischemic strokes are often referred to as cerebrovascular accidents (CVA) and could be a thrombotic or embolic event¹³.

The effects of the blockage are related to the location of the blockage in the brain rather than the source; however, the source becomes vitally important in identifying the cause for individual management and secondary stroke prevention¹⁴.

Approximately 10-15% of all strokes are hemorrhagic and have an estimated 40%-50% mortality rate several risk factors determine the outcome of stroke. Hyperglycemia, fever, neuroprotective agents are those which are widely studied¹⁵.

AIMS AND OBJECTIVES

1. To measure the blood glucose level within twenty four hours of the onset of stroke in both diabetics and in non diabetics.
2. To evaluate the severity and prognosis in both diabetics and non diabetics in relation to hyperglycemia.

METHODOLOGY

This was a record based retrospective cross-sectional study conducted by collecting datas of patients admitted with cerebrovascular accident to the General Medicine department, Mandya Institute of Medical Sciences, Mandya during a period January 2021 to December 2021.

Records of 30 subjects who are of age more than 40 years were obtained and analysed for demographic features like age and sex, investigations like Random blood glucose, Fasting blood glucose, Post prandial blood glucose, HbA1c and CT brain were collected along with outcome as in discharge from hospital and in-hospital mortality.

RESULTS

Table 1: Sex wise distribution

Sex	No of cases	%
Male	21	70
Female	9	30

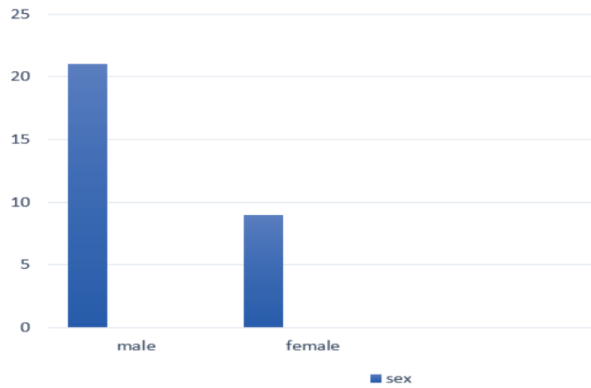


Figure 1: sex wise distribution

Table 2-Age wise Distribution among study population

Age	male	female	%
41-49	2	0	6.6
50-60	8	2	33.33
61-70	7	5	40
>70	4	2	20

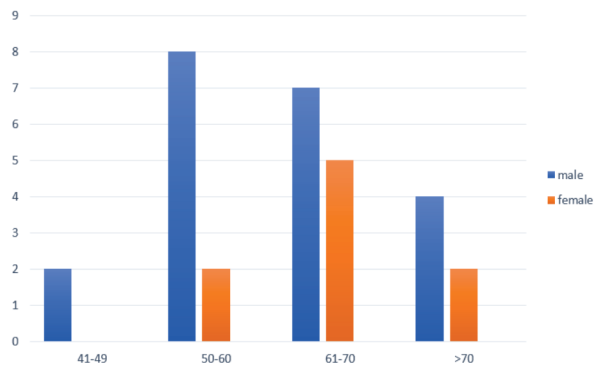


Figure 2-Age wise Distribution among study population

Table 3: Glycemic status

Glycemic status	total
Euglycemia	11
Stress hyperglycemia	8
Known diabetic	4
Newly diagnosed diabetic	7

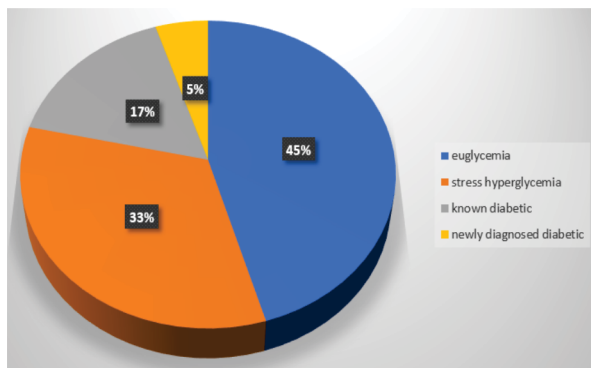


Figure 3: Glycemic status

Table 4: clinical outcome

group	discharge	death	total
euglycemia	11	0	11
Stress hyperglycemia	3	5	8
Known diabetic	4	0	4
Newly detected diabetic	4	3	7

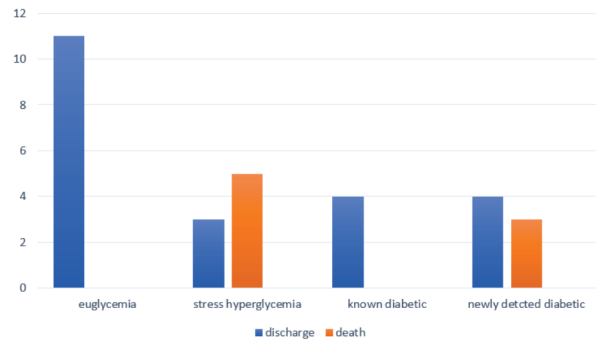


Figure 4: clinical outcome

DISCUSSION

In 2014 in a study conducted by Ghanachandra Singh et al, stroke occurred in most of the patients in the age group of 51-60 yrs (30%)¹⁶. But according to Bonita R et al stroke incidence rate rises exponentially with increasing age with 100 fold increase in the rates from about 3/10,000 population in the 3rd and 4th decade to almost 300 in 8th and 9th decade¹⁷. In our study majority(40%) belonged to age group of 61-70 years.

According to Sunanda T et al, in 2016in their study most of the patients were of male predominance 72%¹⁸. In 2017 in Sruthi Nair et al, study males were are of 64%. Similar results were observed in our study with male predominance of 70%¹⁹.

According to Perttu J. Lindsberg hyperglycemia was noted in two third (66%) of all ischemic stroke patients²⁰. In our study hyperglycemia was noticed in 63% of patients in general

In the journal of clinical endocrinology and metabolism, 2002 a study confirmed that patients with newly detected hyperglycemia had a significant higher early mortality and a lower functional outcome than patients with a history of diabetes or normoglycemia²¹. Our study in 30 acute stroke patients had the same results.

In 2015 according to Sing Bong Shin et al, hyperglycaemia after stroke had adverse effects on the clinical course of ischaemic stroke²². In 2017 Young Seo Kin et al, study also concluded that hyperglycaemia is positively associated with poor functional outcome²³.

Hence, there is an urgent need to confirm the improvement in these patients by normalizing blood sugar.

CONCLUSION

Admission day elevated glucose level was a significant predictor of mortality and poor functional outcome after acute stroke.

Limitations

1. The first being its retrospective nature, the small sample size and a single-center study

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