

A Study of Clinical Correlation between Serum Homocysteine Level In Patients of Cerebrovascular Stroke (CVA), At Rims, Ranchi, Jharkhand , India.

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Abstract

Introduction: Cerebrovascular stroke is one of the leading causes of death and disability throughout the World. There are many risk factors which precede stroke by several years. Hypertension is considered the main risk factor for cerebral thrombosis as well as cerebral hemorrhage. In most cases stroke is merely an incident in the slowly progressive course of a generalized vascular disease.

Objective: To determine the association of serum homocystiene level with other clinical findings associated with patients of stroke.

Method: Data for the study was collected from patients with CVA admitted in Department of Medicine at R.I.M.S RANCHI. Total of 100 patients were included in this study and their detailed clinical and etiological analysis was done.

Conclusion: High prevalence of elevated homocysteine in patients with stroke.

Keywords: Cerebrovascular stroke, Hypertension, Homocysteine.

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I. Introduction

Cerebrovascular stroke is one of the leading causes of death and disability throughout the World¹. There are many risk factors which precede stroke by several years. Hypertension is considered the main risk factor for cerebral thrombosis as well as cerebral hemorrhage. Several prospective trials revealed that homocysteine level has a strong predictive power in stroke and numerous pathways have been identified through which it can promote damage to vessels .

“Stroke” is defined as an acute neuronal injury that occurs as a result of diseases of cerebral vasculature and its contents².

Transient ischemic attack (TIA) is defined as a transient episode of neurologic deficit caused by brain, spinal cord, or retinal ischemia, which recovers within 24 hours of duration³.

There are two main types of stroke : ischemic, due to lack of blood flow, and hemorrhagic, due to bleeding. Of all the stroke, ischemic stroke is more common incidence wise.

Cardiovascular diseases, predominantly heart disease and stroke, were the cause of death in 17.5 million individuals. After heart disease, Stroke is the second leading single cause of death, with 5.8 million fatal cases per year, 40% of which are in people younger than 70 years. About 15 million new acute stroke events arise every year, and about 55 million people have had a stroke at some time in the past, either with or without residual disability; two-thirds of these individuals live in low income and middle-income countries. Important Risk factor for stroke includes diabetes, hypertension, smoking and dyslipidemia.

Homocysteine is believed to cause atherogenesis and thrombogenesis via endothelial damage, vascular smooth muscle proliferation, and coagulation abnormalities. High homocysteine levels are associated with increased risk of cardiovascular and cerebrovascular disease.

Many case control studies done previously proven that serum homocysteine levels was elevated in smokers, hypertensive and dyslipidemia patients. Hence this study is designed to investigate mainly the association between serum homocysteine levels and acute stroke outcome⁴.

II. Materials and Methods

Source of Data: Patient admitted to, Department of medicine, Rajendra Institute of Medical Sciences, Ranchi, in the study period between August 2017 to August 2018.

Inclusion Criteria:

- Those with neurological deficit lasting for more than 24 hours and CT showing Cerebral Hemorrhage or Infarction.
- Those presenting within 7 days of onset of stroke .

Exclusion Criteria:

- Trauma related stroke
- Patients with subarachnoid hemorrhage
- CT scan not done due to any reason
- Thrombocytopenia
- Known case of Hereditary disorders of coagulation
- Known case of Hemophilia, any bleeding disorders, vasculitis or any connective tissue diseases.

Study requiring investigations to be conducted:

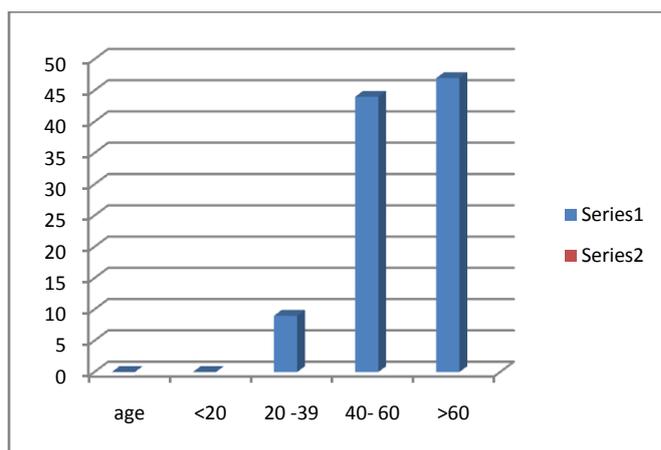
RBS
Complete blood count
Lipid profile

III. Results

AGE DISTRIBUTION

Out of 100 patients participated in study 9 are aged between 20 to 39 years, 44 were between 40 to 60 year of age and 47 were more than 60 year of age.

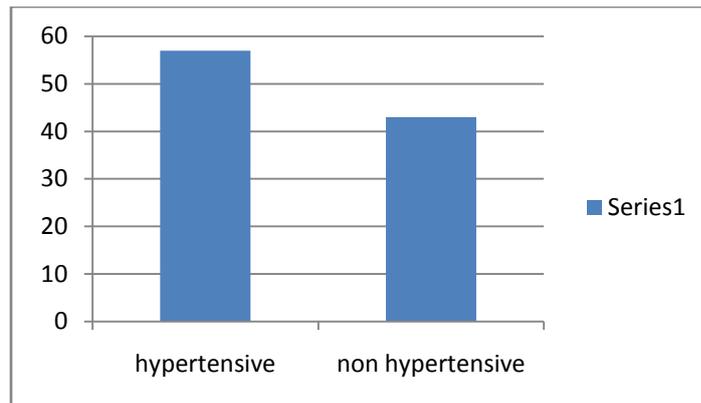
AGE IN YEARS	NO. OF PATIENTS	PERCENTAGE
<20 YRS	0	0
20 -39 YRS	9	9%
40-60 YRS	44	44%
>60 YRS	47	47%



HYPERTENSION

In the study, 57% were known case of systemic hypertension.

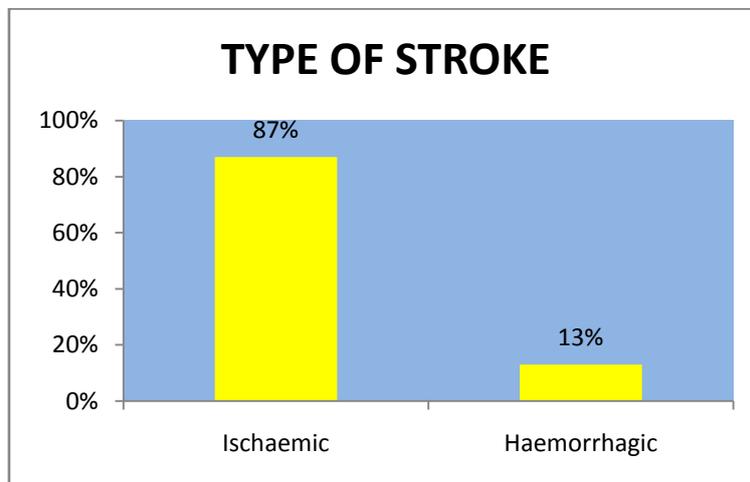
	NO. OF PATIENTS	PERCENTAGE
HYPERTENSIVE	57	57%
NON HYPERTENSIVE	43	43%



STROKE

In this study, out of 100 patients of stroke 87% were having ischemic stroke and 13% were having hemorrhagic stroke, shown in the bar chart.

	NO. OF PATIENTS	PERCENTAGE
ISCHEMIC	87	87%
HEMORRHAGIC	13	13%



LEVEL OF CORRELATION WITH HOMOCYSTEINE

FACTORS	CORRELATION COEFFICIENT
SBP	0.11
DBP	0.152
RBS	0.044
SSS	0.157
MRS- AD	0.164
MRS- DIS	0.133

Factors like SBP, SSS, MRS-AD & MRS-DIS were compared and found to be correlated with homocysteine level.

P value for these factors were <0.01 and was statistically significant.

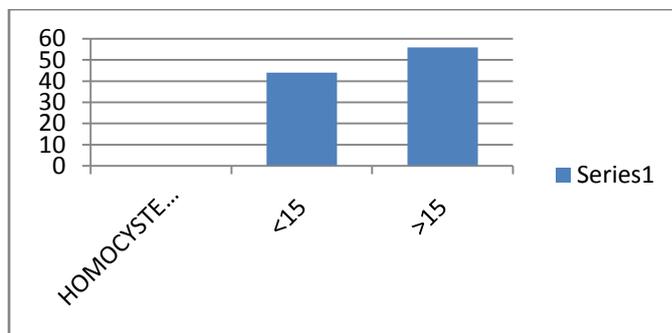
In the study homocysteine was measured of all the 100 pts, with a minimum value of 5.45 and a maximum of 90.78. Of this data mean is 29.53 with a standard deviation of 22.47.

HOMOCYSTEINE STATISTICS	
N	100
MEAN	29.53
MEDIAN	23.5
MODE	12.38
STD. DEVIATION	22.47
STD. ERROR OF MEAN	2.2
VARIANCE	504.72
MIN	5.45

MAX	90.78
RANGE	85.23

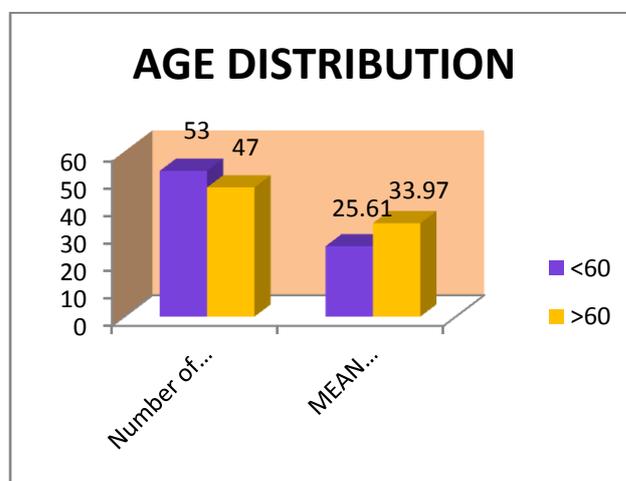
Homocysteine in this study is shown in bar chart, was found >15 in about 56% patients and <15 in 44% patients.

HOMOCYSTEINE	N	PERCENTAGE
<15	44	44%
>15	56	56%

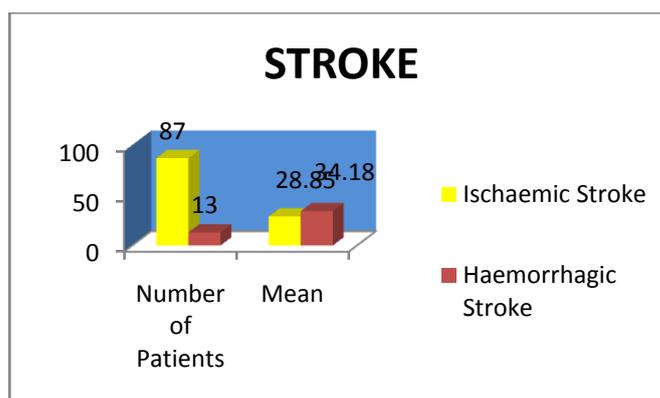


HOMOCYSTEINE

	<60 YR	>60 YR
N	53	47
MEAN	25.61	33.97



	ISCHEMIC	HEMORRHAGIC
N	87	13
MEAN	28.85	34.18



IV. Discussion And Conclusion

This study was conducted among the Indian population involving 100 patients who got admitted in our hospital with clinical features and investigations suggestive of cerebrovascular accident. Out of all the patients in the study 87% were ischemic and 13% were hemorrhagic stroke. This is comparable to the population based **study done in Germany** between 1994-1998 which showed an incidence of ischemia as 78% and hemorrhage as 22%.

In our study of 100 patients of stroke, homocysteine was measured of all the 100 pts, with a minimum value of 5.45 and a maximum of 90.78. Of this data mean is 29.53 with a standard deviation of 22.47.

Factors like SBP, SSS, MRS-AD & MRS-DIS were compared and found to be correlated with homocysteine level. P value for these factors were <0.01 and was statistically significant.

44% of the patients were having homocysteine level >15 and 56% were those >15.

There was rise in homocysteine level with increase in the age, and it is an important risk factor for stroke in elderly.

These findings correlate with study by **I.J. Perry et al(1995)⁵**, which shows that hyperhomocysteinemia is an independent risk factor for stroke in elderly.

In the study by **Jacob Selhub et al(1995)⁶**, the effect of elevated homocysteine is multifactorial, affecting both the vascular wall structure and the blood coagulation system and mild hyperhomocysteinemia is associated with increased risk of arteriosclerotic disease and stroke.

In the study there were 58% male with mean homocysteine 30.77 and 42% female with mean homocysteine 27.84.

In the study there were 87% ischemic stroke with mean homocysteine of 28.85 and hemorrhagic stroke with mean 34.18. Homocysteine level was raised in hemorrhagic stroke.

Out of 100 patients 13 patients died who has a mean homocysteine level of 30.39 and 87 patients were discharged who has a mean homocysteine level of 29.41.

Scandinavian stroke scale which measured the severity of stroke, mean value in the patients in our study was 29.54. The correlation between mean homocysteine and SSS was statistically significant. P value 0.003.

MRS at the time of admission and discharge was significantly correlated with mean homocysteine which is 29.54. p value was 0.01. MRS at admission was 3.95 and at discharge 2.89.

The mean systolic blood pressure was 144.4 among the stroke patients in our study. We could not establish a statistically significant relation between homocysteine and systolic blood pressure.

In the study, homocysteine level were measured, smokers were 39% and non smokers 61% of the total patients. The mean homocysteine in smokers were 32.66 and in non smokers were 27.55. The level of homocysteine was elevated in smokers as compared to non smokers.

Among the hypertensive patients, which constitute 57% of the patients, mean homocysteine level was raised and it was 30.11 and in non hypertensive patients which comprises 43% it is 28.79.

Among the patients 70% were diabetic, mean homocysteine level was 28.50 and 30% are non diabetic it is 29.99. Its correlation coefficient is 0.66, hence significantly correlated. P value of 0.04.

High prevalence of elevated homocysteine in patients with stroke.

Homocysteine may play a role in pathogenesis of stroke.

Level of homocysteine has a definite role in determining the mortality in patients with stroke.

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