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A Study of Clinical Correlation between Serum Hscrp 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. 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.*

Objective: *To determine the association of serum hscrp 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 hscrp in patients with stroke.*

Keywords: *Cerebrovacsular stroke, Hypertension, Hscrp.*

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I. Introduction

Cerebrovascular stroke is one of the leading causes of death and disability throughout the World[1]. 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 contents[2].

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 duration[3].

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.

There is growing evidence that C-reactive protein (CRP), a peripheral marker of inflammation, is also a marker of generalized atherosclerosis[4]. This relationship between inflammation and atherosclerosis make CRP a potential marker for prognosis after vascular events and a potential predictor of future vascular events. Acute phase proteins have been implicated to play roles both during acute and chronic inflammatory processes in different diseases including ischemic stroke[5].Variables that are predictors of adverse stroke outcome include erythrocyte sedimentation rate, and levels of C-reactive protein (CRP), interleukin-6, tumor necrosis factor-α and intercellular adhesion molecule-1. At the beginning of stroke the elevated level of inflammatory markers such as C-reactive protein (CRP) may reflect the underlying burden of atherosclerosis and/or the association of concomitant risk factors (e.g. Diabetes mellitus, Hypertension, Obesity)[6]. Cut off value for hs-CRP for assessing the prognosis of stroke in this study was taken as ≥ 10.1 mg/L and the serum hs-CRP level was correlated with the functional recovery of patients after 30 days using the MRS. This was based on a study by **The 'Bergen stroke study'.**

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:

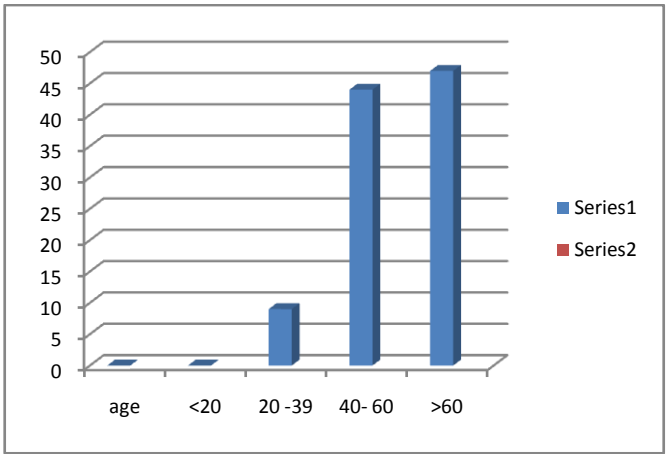
RBS
Complete blood count
Lipid profile

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.

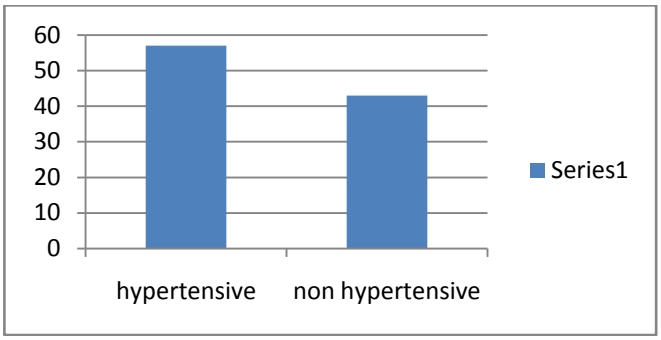
AGE IN YEARS	NO. OF PATIENTS	PERCENTAGE
<20 YRS	0	0
20 -39 YRS	9	9%
40-60 YRS	44	44%
>60 YRS	47	47%



HYPERTENSION

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

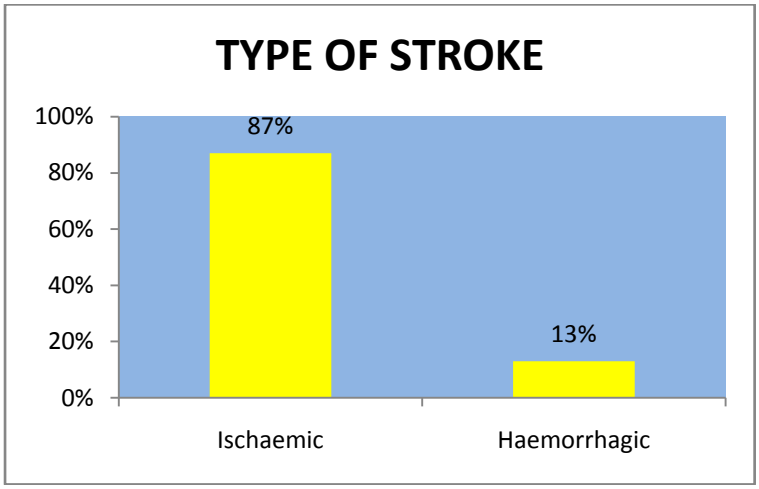
	NO. OF PATIENTS	PERCENTAGE
HYPERTENSIVE	57	57%
NON HYPERTENSIVE	43	43%



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.

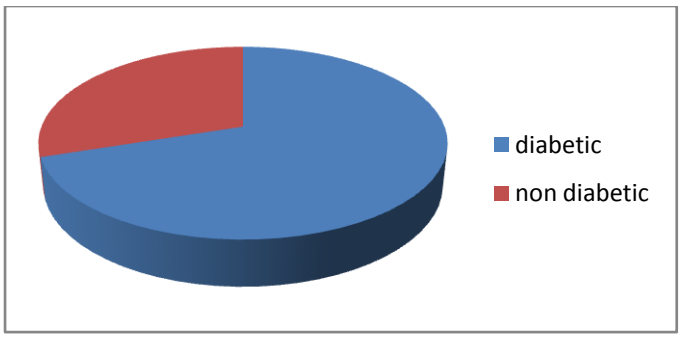
	NO. OF PATIENTS	PERCENTAGE
ISCHEMIC	87	87%
HEMORRHAGIC	13	13%



DIABETES

30% of our patients were diabetic in the study.

	NO. OF PATIENTS	PERCENTAGE
DIABETIC	70	70%
NON DIABETIC	30	30%



HsCRP

LEVEL OF CORRELATION WITH hsCRP

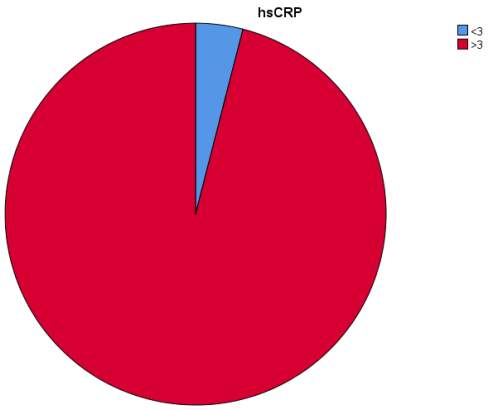
FACTORS	CORRELATION COEFFICIENT
SBP	0.22
DBP	0.163
RBS	0.23
SSS	0.033
MRS- AD	0.028
MRS- DIS	0.14

In our study data analyzed and correlation coefficient was derived between hsCRP and different factors like SBP, DBP, RBS, SSS.
The correlation coefficient was more between SBP, RBS.
P value was significant between SBP, DBP, RBS AND MRS AD, it was <0.01, was statistically significant.
Total no. of pt were 100 in the study and minimum value of hsCRP was 2.4 and the maximum value was 83.
Mean of the total was 22.32 with a standard deviation of 19.43.

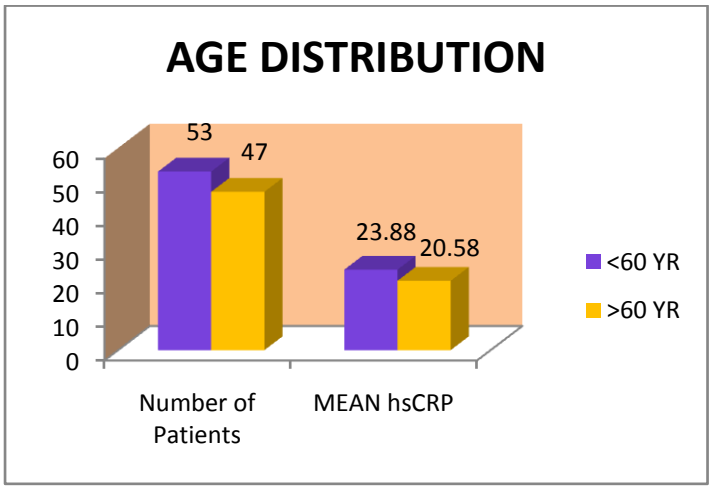
HsCRP STATISTICS	
N	100
MEAN	22.32
MEDIAN	14
MODE	25.2
STANDARD DEVIATION	19.43
STANDARD ERROR OF MEAN	2.0
VARIANCE	377.44
MINIMUM	2.4
MAXIMUM	83
RANGE	80.6

HsCRP in this study, of the 100 pt in the study 96 were having raised hsCRP i.e. >3 and 4 were having <3, this shown in the pie chart.

hsCRP	N	PERCENTAGE
<3	4	4%
>3	96	96%

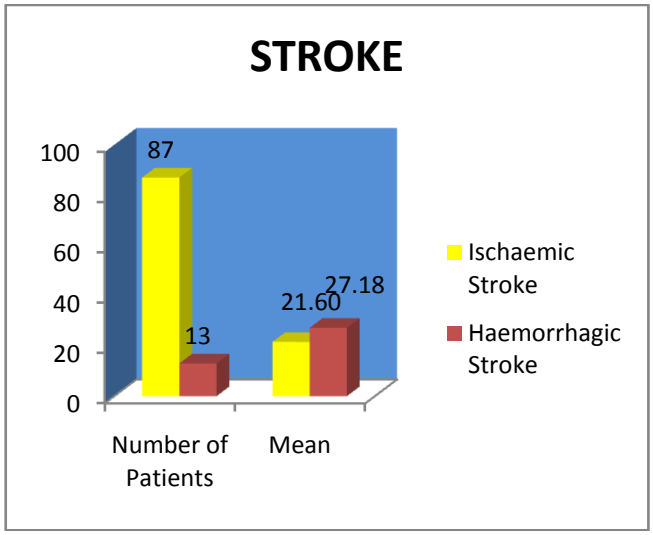


	<60 YR	>60 YR
N	53	47
MEAN	23.88	20.58



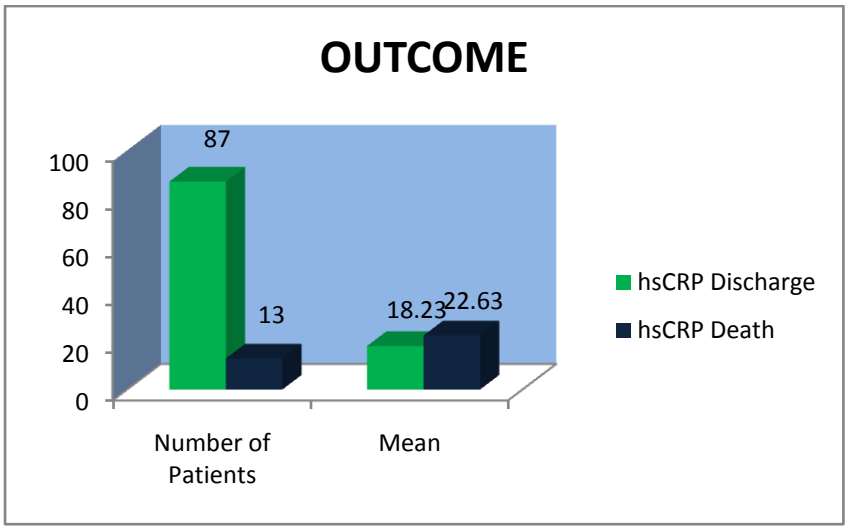
This bar diagram shows raised hsCRP in elderly > 60yr of age and in <60 yr of age , this correlation was not statistically significant.

	ISCHEMIC	HEMORRHAGIC
N	87	13
MEAN	21.60	27.18



This bar chart shows ischemic and hemorrhagic stroke with variation of level of hsCRP . HsCRP is raised in hemorrhagic stroke as compared ischemic stroke. Its level was significantly raised in stroke.

	DISCHARGED	DEATH
N	87	13
MEAN	18.23	22.63



This picture shows mean hsCRP level in patients discharged or death. Mean hsCRP level was raised in patients died.
Mean hsCRP in death patient is 22.63.

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 stroke patients, minimum value of hsCRP was 2.4 and maximum was 83. 4% of patients were having hsCRP level <3 and 96% were having >3. Mean was 22.32 with a standard deviation of 19.43 and standard error of mean was 2.0.

Correlation coefficient was calculated between hsCRP and SBP, DBP, RBS ,SSS, MRS at ADMISSION and at DISCHARGE.

The correlation coefficient was more between SBP and RBS.
P value was significant for hsCRP and these factors, it was <0.01, was statistically significant.
Studies by **Tahir Yoldas et al**[7] (mediators of inflammation 2007),clearly showed that levels of hs CRP done on 2nd day after the stroke strongly associated with short term unfavorable prognosis.
Beamer et al[8] have reported that stroke patients without infections have increased levels of CRP.
Muir et al[9], have shown CRP levels within 1st 72 hours following an acute ischemic stroke as an independent predictor for predicting survival.
Studies by **Di Napoli**[10] has shown that a large infarct and cortical involvement in patients had a highest CRP values than normal at the time of presentation. This study also confirmed that prognosis in patients with increased CRP level is worse.
With increase in age there is a gradual increase in hsCRP. This correlates with study by **M.A.Mendall et al**[11]**, Praful patel et al**[12]**,** that there is an elevation in hs CRP as age advances.
Another study by **Seishi yamada et al**[13] in Japanese population also confirmed this observation.

As CRP was found to be an independent risk indicator of further cardiovascular and neurovascular events as shown by the subset of **Framingham study**, routine CRP screening of susceptible population like chronic smokers and sibilings and first degree relatives of patients with IHD and stroke may prove a valuable indicator for predicting future atherothrombotic events and then it can be assessed as a routine indicator for aspirin prophylaxis. Thus CRP measurements may be helpful in grading patients into high risk and low risk category for predicting future cardiovascular and neurovascular event.
Patients with elevated hsCRP had a poorer outcome when compared to patients with lower levels of CRP, at the of admission.
The hs CRP level increases as age advances.
There was statistically significant correlation between hs-CRP levels and those with diabetes , hypertension and smokers and post menopausal women.
hs-CRP is 100% sensitive and 86.14% specific as a prognostic tool in acute ischemic stroke. hs-CRP has a diagnostic accuracy of 94% in patients with acute ischemic stroke .

References

[1]. Harrison's Principle of Internal Medicine, 19 E(2015) chapter 446, page 2559.
[2]. Brain's textbook of nervous system , oxford university press UK.
[3]. Easton JD, Saver JL, Albers GW, et al. Definition and evaluation of transient ischemic attack.
[4]. Elias-Smale SE, Kardys I, Oudkerk M, Hofman A, Witteman JC: C-reactive protein is related to extent and progression of coronary and extra-coronary atherosclerosis; results from the Rotterdam study. *Atherosclerosis* 2007, 195:e195-e202
[5]. Admission C – reactive protein after acute ischemic stroke is associated with stroke severity and mortality: The 'Bergen stroke study'. *BMC Neurology* 2009, 9:18
[6]. Smith WS, Johnston SC, Easton JD. Cerebrovascular diseases. In: Kasper DL, Fauci AS, Longo DL, Braunwald E, Hauser SL, Jameson LJ, editors. Harrison's Principles of Internal Medicine. Vol 2.16th Edn. New York: McGraw Hill;2005.p.2372-2393.
[7]. Tahir Yoldas, Murat Gonen, Ahmet Godekmerdan, Fulya Ilhan, and Ednan Bayram, "The Serum High-Sensitive C Reactive Protein and Homocysteine Levels to Evaluate the Prognosis of Acute Ischemic Stroke," Mediators of Inflammation, vol. 2007, Article ID 15929, 5 pages, 2007.
[8]. Interleukin-6 and interleukin-1 receptor antagonist in acute stroke.Beamer NB, Coull BM, Clark WM, Hazel JS, Silberger JRAnn Neurol. 1995 Jun; 37(6):800-5.
[9]. C-reactive protein and outcome after ischemic stroke.Muir KW, Weir CJ, Alwan W, Squire IB, Lees KR Stroke. 1999 May; 30(5):981-5
[10]. Di Napoli M, Papa F, Bocola V. C-reactive protein in ischemic stroke: an independent prognostic factor. *Stroke*. 2001;32(4):917–924.
[11]. Mendall MA, Strachan DP, Butland BK, Ballam L, Morris J, Sweetnam PM, Elwood PC. C-reactive protein: relation to total mortality, cardiovascular mortality and cardiovascular risk factors in men. *Eur Heart J*2000;**21**:1584-1590.
[12]. Mendall MA, Patel P, Ballam L, Strachan D, Northfield TC (1996) C reactive protein and its relation to cardiovascular risk factors: a population based cross sectional study. BMJ 312: 1061–1065.
[13]. Yamada S, Gotoh T, Nakashima Y, et al. Distribution of serum C-reactive protein and its association with atherosclerotic risk factors in a Japanese population: Jichi Medical School cohort study. Am J Epidemiol 2001;153:1183–1190.

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