ORIGINAL RESEARCH PAPER

General Medicine

C- REACTIVE PROTEIN AS A PROGNOSTIC MARKER IN ACUTE ISCHEMIC STROKE

KEY WORDS: C-Reactive protein, ischemic stroke, Barthel index.

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ABSTRACT

Background: Stroke is the second leading cause of death worldwide and the most common disabling disease. The objective of this study is to estimate the CRP role, as an acute inflammatory marker following ischemic stroke and to determine its prognostic significance.

Methods: This study group was conducted from September 2018 – April 2019 in Narayana Medical College with a sample size of 100 patients. All tests were done as per standard stroke workup protocol. Estimation of CRP was done within 24 to 48 hrs after hospital admission.

Results: In this study, maximum patients are in between sixth to seventh decade with male to female ratio of 4:1. According to Barthel index, those patients who had CRP < 6mg/dL had a good functional outcome, while those with CRP >6mg/dL had a poor functional outcome, suggesting CRP as a good prognostic indication with p valve < 0.05, significant.

Conclusions: Maximum patients were in 6th to 7th decade with male preponderance. The elevated CRP is a non-specific but highly sensitive marker of inflammation following ischemic stroke.

INTRODUCTION

Stroke is the second most leading cause of death worldwide. Acute stroke triggers an inflammatory response leading to increased levels of CRP. C- Reactive protein is an acute phase reactant which is synthesized in the liver. CRP levels are stable without any circadian variations making CRP measurement more convenient. The present study attempts to investigate the prognostic importance of CRP in acute ischemic stroke.

MATERIALS AND METHODS

It is a perspective cross-sectional observational study with 100 patients who were admitted in Narayana medical college & hospital during September2018- April 2019. A detailed history and physical examination with stroke workup protocol along with CRP estimation within 24-48hrs of estimation was done.

INCLUSION CRITERIA

Patients of both sexes of age >18years.

Patients with CT Scan of Brain was taken within 48hrs of onset and with those documented as ischemic stroke.

EXCLUSION CRITERIA

Patients with Intracranial bleed, Intracranial infections were excluded.

TIA and old CVA.

RESULTS

A 100 atients with ischemic stroke were studied who were in-between age of 26-85.

TABLE 1 AGE DISTRIBUTION

Age group (years)	No of cases
26-35	1
36-45	11
46-55	16
56-65	32
66-75	31
76-85	9
Total	100

Mean age 61.8years

A maximum number of stroke patients were in between 6th to 8th decade.

TABLE 2 SEX DISTRIBUTION

Gender	No of cases
Male	80
Female	20

Male preponderance with Male: Female Ratio 4:1

TABLE 3 BARTHEL INDEX and AGE

Age Group	Severity			Total
Years	Mild	Moderate	Severe	
26-35	1	0	0	1
36-45	10	1	0	11
46-55	12	3	1	16
56-65	16	10	6	32
66-75	11	12	8	31
76-85	2	3	4	9
Total	52	29	19	100

Chi-square 19.2
P <0.05

In this study of 100 patients, 52 were mildly disabled, 29 were moderately disabled, and 19 were severely disabled according to Barthel index scoring.

32 patients are between 56-65years of age, 16 mildly, 10 moderately, and 6 severely disabled.

31 patients are between 66-75years of age, 11 mildly, 12 moderately, and 8 severely disabled.

1 was in between 26-35years of age, was mildly disabled.

P <0.05, significant, suggesting elderly patients are more disabled.

TABLE 4 BARTHEL INDEX and SEVERITY

Severity	Day1	Day5	Discharge	3Months
Mild	52	81	84	85
Moderate	28	4	3	2
Severe	20	15	10	10
Death	-	-	3	3
Total	100	100	100	100

According to Barthel scoring, on day 1, 52patients were mildly, 28 moderately, 20 severely disabled.

On day 5, 81patients were mildly, 4 moderately, 15severely disabled.

At discharge, 84patients were mildly, 3 moderately, 10severely disabled, 3patients died.

During 3months of follow up, 85patients were mildly, 2moderately, 10severely disabled.

TABLE 5 BARTHEL INDEX and C-Reactive Protein

Severity	No of cases	CRP	
		<6mg/dL	>6mg/dL
Mild	52	52	0
Moderate	28	26	2
Severe	20	7	13
Total	100	85	15

Chi-Square 49.74, P<0.05

13 out of 20 severely disabled patients had CRP value >6mg/dL.

2 out of 28 moderately disabled patients had CRP value >6mg/dL.

52 out of 52 mildly disabled patients had CRP value <6mg/dL. P-value < 0.05, significant, suggesting severity in relation with CRP

DISCUSSION

This study was done in ischemic stroke patients, shows that a high CRP level, within 24 to 48hrs of admission is associated with poor functional outcome and high mortality. In this study, the peak incidence of CVA was in-between, 56 to 75 years, which is comparable to K.K Shika et al. where most of the cases in-between 6th to 7th decade.

This study shows a male predominance with a sex ratio of 4:1 which is comparable to an epidemiological study done by T.Truelsen et al. where there was a male predominance of 41% more than female with variations in-between different age groups and nationalities.

In this study according to Barthel Index, 52 mild cases on day 1, have a CRP level of 6mg/dL at admission, and there was an improvement in their functional outcome on day 5, at discharge and 3months followup.

There are a total of 28 cases with moderate disability, 26 of them have CRP of <6mg/dL and 2 have CRP>6mg/dL. These 26 patients showed functional improvement determined by their Barthel score on day 5, at discharge, at 3months.

20patients were severely disabled, out of this 13 had a CRP of >6mg/dL on day1, p-value <0.05, significant, Chi-square 61.9 study by Kerstin Winbeck et al. had a similar picture with CRP at 12-24hrs of admission and Barthel scoring having an increasing incidence of functional outcome.

In a study by, Rajnder K Dhamija et al., raised CRP was significantly associated with poor functional outcome.

Panicker J N et al. studied the functional outcome by Barthel score and divided the patients into mild, moderate, severe, and CRP was estimated at admission and concluded that high CRP is associated with poor outcome.

Gussekloo et al. study showed, CRP is a substantial risk factor of fatal stroke, and death risk was increased in population with high CRP by 10 folds.

CONCLUSION

It is a prospective, cross-sectional, observational study in ischemic stroke patients, with a study group of 100patients, showing the following results.

- Maximal patients fall in-between 6th to 8th decade and male predominance with a sex ratio of 4:1
- There was a significant rise in CRP in ischemic stroke at admission, at the onset of symptom, reflecting its role in inflammation in CVA.
- There was a rise in CRP in relation to the functional outcome as per the modified Barthel Score

DECLARATION

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Conflict of interest: None declared

Ethical approval: Study was approved by the institutional ethics committee

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