Study of serum fibrinogen level in hemorrhagic stroke

[1]Dr Harsh Tak, Assistant Professor J L N Medical, Ajmer

[2]Dr Ravi Kumar Bansal, Senior Resident J L N Medical College, Ajmer

[3]Dr. Dharmendra Kumar Verma, J L N Medical College, Ajmer

[4]Dr. Khushboo Agarwal, Senior Resident J L N Medical College, Ajmer

Corresponding Author: Dr. Ravi Kumar Bansal, Senior Resident J L N Medical College, Ajmer

Abstract

Introduction: Epidemiological observations indicate that high plasma fibrinogen levels strongly correlate with two major thrombotic complications of atherosclerosis stroke and myocardial infarction. Thrombosis is increasingly recognized as a central mechanism in stroke as well as in myocardial infarction. Fibrinogen is involved in events thought to play a major role in thrombosis.

Methods: A total of 100 subject of groups are both sexes were enrolled for this study. There were grouped as follows: Group I (Cases): 50 patients admitted to JLN Hospital, Ajmer with acute hemorrhagic stroke syndrome (ischemic) as per WHO criteria. Group II (Controls): 50 subjects who had never suffered from this stroke were selected as control subject.

Results: There was significant difference in plasma fibrinogen level between case (384.95±124.96) and control (260.02±73.04), the relationship was statistically significant p value was <0.001. Our study shows increase in mean plasma fibrinogen level in hemorrhagic stroke.

Conclusions: High plasma fibrinogen levels have poor outcome, so it can be used as prognostic marker in stroke.

Keywords: Stroke, Plasma, Syndrome, Thrombosis

Introduction

Stroke is a clinical syndrome which is defined as "abrupt onset of focal neurological deficit that is attributable to a focal vascular cause(1)"with symptoms lasting for 24 hours or longer. It makes an important contribution to morbidity mortality and disability in developed as well as developing countries, prevalence rate in India is about 1.54 per thousand and the death rate 0.6 per 1000(2).Risk factor for stroke includes diabetes, hypertension, smoking and hyperlipidemia and these have been linked to abnormalities of haemorheology and coagulation such as increased fibrinogen(3,4). Epidemiological observations indicate that high plasma fibrinogen levels strongly correlate with two major thrombotic complications of atherosclerosis stroke and myocardial infarction. Thrombosis is increasingly recognized as a central mechanism in stroke as well as in myocardial infarction. Fibrinogen is involved in events thought to

play a major role in thrombosis(5). Fibrinogen is a soluble plasma glycoprotein that consists of three non - identical pairs of polypeptide chains (Aα, Bβ and γ chains)(6).

Materials

The present study was conducted in the Department of Medicine, J.L.N. Medical College Ajmer.

A total of 100 subject of various age groups are both sexes were enrolled for this study. There were grouped as follows:

Group I (Cases): 50 patients admitted to JLN Hospital, Ajmer with acute stroke syndrome as per WHO criteria i.e., "rapid onset of clinical signs of focal or global disturbance of cerebral function lasting for more than 24 hours or leading to death with no apparent cause other than the vascular lesion".

Group II (Controls): 50 subjects who had never suffered from this stroke were selected as control subject.

Exclusion Criteria

Following exclusion criteria applied to both the study groups

1)   Patient with absent peripheral pulses

2)   Pregnancy and puerperium

3)   Moderate and severe alcoholism

4)   Women on oral contraceptive pill

5)   Myocardial infarction or surgery with in the previous 3 months

All patients and controls were subjected to a protocol (as per proforma) which included a detailed clinical history and relevant examination.

All the patients were subjected to the following baseline investigations:

Routine Investigations

➢ Complete haemogram including haemoglobin,total leucocyte count, differential leucocyte count, ESR and haematocrit.

➢ Urine analysis

➢ Blood sugar

➢ Serum bilirubin

➢ Serum urea and creatinine

➢ Serum lipids

➢ X-Ray chest

➢ PT/PTTK

➢ 12 lead electrocardiogram

Special Investigation:

➢ CT Scan of head.

➢ Plasma fibrinogen levels on day of admission.

Observation

Table 1: Distribution of cases according to age

Age group (years)	No. of patients	Male	Female
31-40	4	3	1
41-50	11	9	2
51-60	15	12	3
61-70	16	11	5
>71	4	4	0
Total	50	39	11

In the age group 31 to 40 years,   there were 4 cases. Among them 03 were male & 01 were female. In the age group 41 to 50 years, there were 11 cases. Among them 09 were male & 02 were female. In the age group 51 to 60 years, there were 15 cases. Among them 12 were male & 03 were female. In the age group 61 to 70 years, there were 16 cases. Among them 11 were male & 05 were female. In the age group >71 years,   there were 04 cases & all were male.

Table 2: Distribution of control according to age

Age group (years)	No. of patients	Male	Female
31-40	10	6	4
41-50	12	7	5
51-60	14	5	9
61-70	8	4	4
>71	6	2	4
Total	50	24	26

In the age group 31 to 40 years, there were 10 cases. Among them 06 were male & 04 were female. In the age group 41 to 50 years, there were 12 cases. Among them 07 were male & 05 were female. In the age group 51 to 60 years, there were 14 cases. Among them 05were male & 09 were female. In the age group 61 to 70 years, there were 08 cases. Among them 04 were male & 04 were female. In the age group >71 years, Among them 02 were male & 04 were female.

Table 3: Distribution according to sex

Sex	No. of cases	No. of control
Male	39	24
Female	11	26

Among the cases 50 patients, 39 of the patients were male and 11 were female. Among the control 50 patients, 24 of the patients were male and 26 were female.

Table 3: Age and Mean of Plasma Fibrinogen level

Age Group (Years)	Case		Control	
	No. of case	Mean ± S.D	No. of control	Mean ± S.D
31-40	04	348.75±114.2	10	187.5±34.76
41-50	11	334.5±77.6	12	219.09±60.77
51-60	15	397.1±154.6	14	277.06±68.19
61-70	16	401.8±125.7	08	277.5±85.67
>70	04	446.8± 71.5	06	311.25±43.27
Total	50	384.95±124.96	50	260.02±73.04
P value<0.001				

This table shows that, in age group 31 to 40 years there were 14 patients, out of them 04 were cases and 10 were controls. Their mean values were 348.75 and 187.5, and the standard deviation were 114.2and 34.76. In age group 41 to 50 years there were 23 patients, out of them 11 were cases and 12 were controls. Their mean values were 334.5 and 219.09, and the standard deviation were 77.6 and 60.77. In age group 51 to 60 years there were 29 patients, out of them 15 were cases and 14 were controls. Their mean values were 397.1 and 277.06, and the standard deviation were 154.6 and 68.19. In age group 61 to70 years there were 24 patients, out of them 16 were cases and 08 were controls. Their mean values were 401.8 and 277.5, and the standard deviation were 125.7 and 85.67. In age group >70 years there were 10 patients, out of them 04 were cases and 06 were control. Their mean values were 446.8 and 311.25, and the standard deviation were 71.5 and 43.27. In 50 cases mean were 384.5 and the standard deviation 124.96. While in 50 controls , mean was 260.02 and the standard deviation was 73.04 .There was significant

difference in plasma fibrinogen level between different age group in both case and control, the relationship between age and plasma fibrinogen level was statistically significant p value was <0.001.

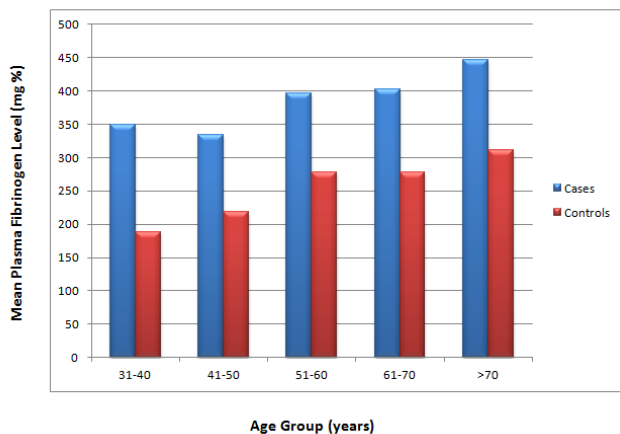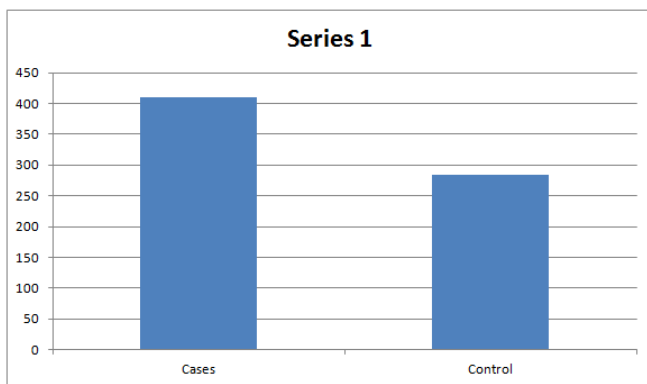Figure 1: Age and Mean of Plasma Fibrinogen Level In Cases And Control

Figure 2: Mean Of Plasma Fibrinogen Level In Case V/S Control

Discussion

There was significant difference in mean plasma fibrinogen level between different age group in both case and control, the relationship between age and plasma fibrinogen level was statistically significant their p value was <0.001. AJ Iee[7] and TW Maede[8] have shown that fibrinogen level increase with age. This study also demonstrates an increasing trend of fibrinogen with age.

Conclusion

In this present study, mean plasma fibrinogen levels were significantly higher in hemorrhagic stroke patients when compared to controls. Fibrinogen levels were significantly higher as the age advances. Plasma fibrinogen level was significantly elevated in risk factor for hemorrhagic stroke. Plasma fibrinogen level has prognostic value in hemorrhagic stroke.

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