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HEMORRHAGIC STROKE;

FREQUENCY OF HYPERTENSION, DIABETES AND SMOKING IN PATIENTS

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ABSTRACT… Objectives: To identify the frequency of risk factors in hemorrhagic stroke at Liaquat university of medical and health sciences. **Patient and methods:** This Descriptive case series study of six months was carried out in the department of medicine, Liaquat University of Medical and Health Sciences. Patients aged 20-70 years of age with hemorrhagic stroke on CT were enrolled in the study after taking consent from caretaker of patients. Detailed history focusing on hypertension, diabetes and smoking and their duration was taken. Blood pressure was recorded and fundoscopy was done to find out diabetic or hypertensive retinopathy. Thorough neurological examination and fasting / random blood glucose level was evaluated while the data was done was analyzed using SPSS version 16. **Results:** A total of 100 patients were included in the study during study period. 61% of patients were in > 50 years of age group with mean age of 53.4±11 years. A total of 66 (66%) were male; with male to female ratio was 2:1. Hypertension was present in 63% of cases, Diabetes was found in 24% cases and 44 patients were cigarette smokers. **Conclusions:** It was concluded that high blood pressure, diabetes mellitus and smoking are associated with hemorrhagic stroke.

Key words: Hypertension, stroke, cigarette, diabetes, smoking and Hemorrhage

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INTRODUCTION

Stroke is a leading cause of morbidity and mortality in the world. This results from sudden loss of blood supply to certain areas of the brain leading to corresponding loss of their functions. Stroke is broadly classified into hemorrhagic and ischemic.1Stroke secondary to intracranial hemorrhage (ICH) is the deadliest, most disabling and least treatable form of stroke despite progression in medical knowledge[1]. Overall ICH (both intracereberal hemorrhage and sub-archnoid hemorrhage) causes 10% to 15% of first-ever strokes, with 30-day mortality rate of 35% to 52%; half of the deaths occur in the first 2 days[2]. Compared to western literature the proportion of hemorrhagic stroke in Asian countries has been reported as high as 21-33%[2]. Reported frequency in Pakistan is even higher, ranging from 24-46%[3]. ICH results from the rupture of the small penetrating arteries that originate from basilar arteries or the anterior, middle, or posterior cerebral arteries. Advancing age and hypertension are the most important risk factors for ICH.

Numerous risk factors for stroke have been identified and classified into modifiable and non modifiable risk factors[4-6]. Modifiable risk factors are; hypertension, cigarette smoking, diabetes mellitus, Physical inactivity, hyperlipidemia, carotid artery stenosis, elevated homocysteine, atrial fibrillation, Transient ischemic stroke, protein C and S deficiency and systemic inflammation. Non-modifiable risk factors are; old age, male sex, race and genetic predisposition[7].

Hypertension affects at least 65 million people in the United States and is major risk factor of cerebral infarction and hemorrhage. High blood pressure contributes to 70% of all strokes. Control of blood pressure contributes to the prevention or reduction of the other target organ damage. By controlling hypertension risk of stroke can be reduced by 38%[8]. Patients with type II diabetes mellitus has two to five fold increased risk of developing stroke compared to non diabetic population. In recently published study revealed that diabetes was significantly higher in subjects with small cereberovascular accidents (35.5%)[9].

Cigarette smoking is well established risk factor for all cause mortality as well as vascular disease mortality such as stroke. Heavy cigarette smokers (smoke > 40 cigarettes per day) are at much higher risk of developing vascular diseases compared to light smokers (smoke <10 cigarettes per day). Both current and/or past smoking is associated with high morbidity and mortality[10].

The purpose of this study was to determine frequency of modifiable risk factors, such as, hypertension, diabetes mellitus and smoking in hemorrhagic stroke, so targets of primary and secondary prevention can be achieved which may help us in reducing mortality and morbidity due to stroke as well as improving rehabilitation of such patients.

PATIENTS AND METHODS

This descriptive case series study of six months was carried out in the medical wards of Liaquat University of Medical and Health Sciences. The inclusion criteria of the study were the subjects of age 20-70 years, either gender, known hypertensive, diabetic and current smoker and the CT scan brain demonstrated intracranial bleed while the patients had external cause of bleed like head trauma, bleeding from AV malformation or aneurysms were considered in exclusion criteria. All the relevant patients were enrolled in the study after taking consent from caretaker of patients. A detailed history focusing on hypertension, diabetes and smoking was obtained. Blood pressure was recorded and fundoscopy was done to find out diabetic or hypertensive retinopathy. Thorough neurological and blood glucose (fasting and random) was evaluated. The opinion for CT scans was taken from radiologist have ≥05 years clinical experience.

The data was entered and analyzed by using SPSS version 16. The nominal data (Gender, smoking, hypertension and diabetes) was presented in frequencies and percentages, numerical data (age, blood pressure) by mean, minimum, maximum and standard deviation. Male to female ratio was also calculated.

RESULTS

Total 100 patients were included in the study during six months study period, out of 100 patients, 61% of patients were in > 50 years of age group with mean age of 53.4±11 years (Table I). Minimum age was 24 years and maximum age 70 years. A total of 66 (66%) were male; with male to female ratio was 2:1 (Table II). Among these patients 85% were presented with unconsciousness and 70% presented with focal neurologic deficits (Table III).

Hypertension was present in 63% of cases while the mean systolic blood pressure was 171.5±6 and mean diastolic BP was 95.3±2.5 mmHg in overall population whereas the mean systolic and diastolic pressure in male and female population was 171±8 ±95.4±2.5 and 172±10±95±2.6 respectively. Table IV and V shown the age and gender distribution of patients with hypertension.

Diabetes was found in 24% cases while diabetes is also common in female gender (29.4%) and not statistically significant (Table VI) whereas it is common in older age group (29.4%) (Table VII)

A total of 44 patients were current smokers. The mean cigarette smoking per day was 22.8±5 (Table-VIII). Though smokers were more than 50 years of age but the findings are not statistically significant, p-0.39 (Table-IX).

Age Group	Frequency	Percent
50 years	39	39.0
> 50 Years	61	61.0
Total	100	100.0

Table-I. Age Distribution
Mean Age: 52±5
(Minimum 24 and maximum 70 years)

Sex	Frequency	Percent
Female	34	34.0
Male	66	66.0
Total	100	100.0

Table-II. Gender distribution
Male to female ratio: 2:1

Stroke findings	Frequency	Percent
Focal neurologic deficit	70	70
Unconsciousness	85	85.0
Vomiting	26	26.0
Headache	41	41.0

Table-III. Clinical Presentation

Age group	Hypertension		Total
	Yes	No	
50 years	28 (71.7%)	11 (28.3%)	39
>50 Years	35 (57.3%)	26 (42.7%)	61
Total	63	37	100

Table-IV. Age distribution of patients of stroke with Hypertension

P-0.11

Note: Out of 63 patients with hypertension 44.4% were 50 years of age and 55.6 were more than 50 years of age

Gender	Hypertension		Total
	Yes	No	
Male	41 (62.1%)	25 (37.9%)	66
Female	22 (64.7%)	12 (35.5%)	34
Total	63	37	100

Table-V. Gender distribution of patients of stroke with Hypertension

P-0.48

Note: Out of 63 patients with hypertension 65% were male and 35% female.

Gender	Diabetes		Total
	Yes	No	
Male	14 (21.2%)	52 (78.8%)	66
Female	10 (29.4%)	24(70.6%)	34
Total	24	76	100

Table-VI. Gender distribution of patients of stroke with diabetes

P-0.45

Note: Out of 24 patients with diabetes 58.3% were male 41.7% were female

Age group	Diabetes		Total
	Yes	No	
50 years	10 (29.4%)	24(70.6%)	34
>50 Years	14 (21.2%)	52 (78.8%)	66
Total	24	76	100

Table-VII. Age distribution of patients of stroke with Diabetes

P-0.15

Note: Out of 24 patients with diabetes 41.6% were 50 years of age and 58.4% were more than 50 years of age.

Smoking	Frequency	Percent
Yes	44	44.0
No	56	56.0
Total	100	100.0

Table-VIII. Smoking associated with hemorrhagic stroke

Mean cigarettes / day: 22.8±5

Age group	Smoking		Total
	Yes	No	
50 years	16 (41%)	23 (59%)	39
>50 Years	28 (46%)	33 (54%)	61
Total	44	56	100

Table-IX. Age distribution of patients of stroke with smoking

P-0.39

Note: out of 44 smokers 36.3% were 50 years of age and 63.7% were more than 50 years of age.

DISCUSSION

Stroke is the second most common cause of death and disability in the world[2,3] despite significant advances have also been made in stroke prevention, supportive care, and rehabilitation in recent years. However, the success of this strategy depends on the recognition and control of all important causal and modifiable risk factors[4].

The primary aim of this study was to determine association of modifiable risk factors such as hypertension, diabetes mellitus and smoking.

In this study, out of 100 patients with hemorrhagic stroke on CT scan brain, 61% patients were >50 years of age with mean age of 53.4±11 years. Males were predominated (66%) with male to female ratio was 2:1. These findings are consistent with published literature. A study was conducted in Texas in 2005, reported 66% patients were older age group[11]. Other international studies also described male dominance in patients with ischemic stroke[12,13]. In a study by Kurth et al reported mean age was 52 years[14]. In a study conducted by Christensen and published in Advance therapeutics 2008 described mean age 58±9 years and male to female ratio similar to our study i.e. 2.1:1[15].

The clinical signs and symptoms of stroke are

depends upon involvement of the involved area of brain. Headache, vomiting, and a decreased level of consciousness develop if the hematoma becomes sufficiently large. Headache and vomiting occur in approximately one-half of patients with intracerebral hemorrhage (ICH)[16]. Though this is not the objective of study but unconsciousness and focal neurological signs were common clinical presentation of hemorrhagic stroke each accounting 85% and 70% respectively. Headache was present in 41% cases. Nazir et al reported similar clinical presentation in patients with stroke[17].

In this study hypertension was dominated risk factor for hemorrhagic stroke, more commonly involved male aged more than fifty years of age, Although other risk factors also contributed in development of stroke, e.g. diabetes and smoking. Fieldmann et al in 2005 reported hypertension most dominated cause of hemorrhagic stroke[11]. In this study the mean systolic BP was 171±6 and mean diastolic pressure was 95±2.5. Similar findings were reported by Khan, et al[18].

Though hemorrhagic stroke are less prevalent in diabetic patients[19], in this study 24% had history of diabetes. Out of them 24 patients of hemorrhagic stroke with diabetes, 63% had concomitant hypertension that may explain a bit higher proportion of hemorrhagic stroke in diabetic patients. Zafar et al 2007 conducted study at Liaquat national hospital Karachi reported 12% patients with hemorrhagic stroke has diabetes[20]. Khan et al reported higher proportion of hemorrhagic stroke i.e. 32.7%. All of them have either concomitant hypertension, dyslipidemia, smoking and other risk factors also[18]. In this study out of 24 patients of stroke with diabetes, 58.3% were male and belong to older age group i.e. more than 50 years of age. Khan et al and Zafar et al reported similar findings[18,20].
Cigarette smoking is a potent risk factor for all types of stroke. Cigarette smoking remains prevalent, even among young stroke survivors. Smoking promotes atherosclerosis and hyper-coagulable state. It has been established in older adults smokers were highly vulnerable to develop hemorrhagic stroke[14,3]. In this study the second most common risk factor was smoking accounting for 44% cases; the risk of hemorrhagic stroke was higher in current smokers, smoking more than 20 cigarettes per day and adults of more than 50 years of age. Khan et al reported that 58.1% patients with hemorrhagic stroke were smokers and most of them were more than 50 years of age[18]. Bhat et al reported that those patients who smoke more than 20 cigarettes were associated with hemorrhagic stroke[21].

CONCLUSIONS

It was concluded that high blood pressure, diabetes mellitus and smoking are associated with hemorrhagic stroke both as single and multiple risk factors. These risk factors were found in male patients older than 50 years of age so priority should be made to treat these patients to avoid morbidity and mortality. Therefore, it is recommended that a large scale population based study should be designed to find out other potential risk factor so strategies can be made for overall and comprehensive management of those risk factors.

REFERENCES

1. Dennis MS. **Outcome after brain hemorrhage.** Cerebrovasc Dis. 2003;16: (suppl 1):9-13.

2. Cheung RT. **Cerebrovascular disease: advances in management.** Hong Kong Med J.2001;7:58–66.

3. Ariesen MJ, Clau SP, Rinkel GJ, Algra A. **Risk factor for intracranial hemorrhage in general population: a systematic review.** Stroke 2003;34:2060-5.

4. Khealani BA, Syed NA, Maken S, Mapari UU, Hameed B, Ali S, et al. **Predictors of ischemic versus hemorrhagic stroke in hypertensive patients.** J Coll Physician Surg Pak.2005;15:22-5.

5. Ng WK, Goh KJ, George J. **A comparative study of stroke subtypes between Asian and Caucasians in two hospital- based stroke registries.** Neurol J southeast Asia.1998;3:19-26.

6. Mayer SA. **Ultra-early hemostatic therapy for intracerebral hemorrhage.** Stroke.2003;34:224-9.

7. Hameed B, Khealani BA, Mozzafar T. **Prognostic indicators in patients with primary intraventricular**

hemorrhage. J Pak Med Assoc Aug. 2005;55(8):315-7.

8. Davis BR, Vogat T, Frost PH, Burlando A, Cohen J, Brass LM, et al. **Systolic hypertension in elderly programme cooperative research group. Risk factor of stroke and type of stroke in person with isolated systemic hypertension.** Stroke.1998;29:1333-40.

9. Janghorbani M, Hu FB, Willett WC, Li TY, Manon JE, Logroscino G, et al. **Prospective study of type 1 and type two diabetes and risk factor of stroke: the nurses' health study.** Diabetes care.2007;30:1730-35.

10. Bhat VM, Cole JW, Sorkin JD, Woznaik MA, Malacher AM, Giles WH, et al. **Dose-response relationship between cigarette smoking and ischemic stroke in young women.** Stroke.2008;39:2439-43.

11. Feildmann E, Broderick JP, Kernan WN, Viscoli CM, Brass LM, Brott T, et al. **Major risk factors for intracereberal hemorrhage in the young are modifiable.** Stroke.2005;36:1881-5.
12. Feigen VL, Rinkel GJE, Lawes CMM, Algra A, Bennet DA, Gin JV. Et al. **Risk factor for subarachnoid hemorrhage: An updated systametic review of epidemiological studies.** Stroke.2005;36:2773-80.

13. Smajlović D, Salihović D, C Ibrahimagić O, Sinanović O, Vidović M. **Analysis of risk factors, localization and 30-day prognosis of intracerebral hemorrhage.** Bosn J Basic Med Sci.2008;8(2):121-5.

14. Kurth T, Kase CS, Berger K, Schaeffner ES, Buring JE, Gaziano JM. **Smoking and risk of hemorrhagic stroke in men.** Stroke 2003;34:1151-5.

15. Christensen MC, Dawson J, Vincent C. **Risk of thromboembolic complications after intracerebral hemorrhage according to ethnicity.** Adv Ther.2008;25(9):831-41.

16. Yoon, BW, Bae, HJ, Hong. **Phenylpropanolamine contained in cold remedies and risk of hemorrhagic stroke.** Neurology.2007; 68:146.

17. Nazir FS, Lees KR, Bone I. **Clinical features associated with stroke symptoms presenting to an acute stroke unit.** Euro J Neurol.2005;12:81-5.

18. Khan NI, Naz L, Mushtaq S, Rukh L, Ali S, Hussain Z. **Ischemic stroke: prevalence of modifiable risk factors in male and female patients in Pakistan.** Pak J Pharm.2009;22:62-7.

19. Monkovsky BN, Zeigler D. **Stroke in patients with diabetes mellitus.** Diabetes Metab Res Rev.2004;20:268-87.

20. Zafar A, Shahid SK, Siddiqui M, Khan FS. **Pattern of stroke in type 2 diabetic subject versus non diabetic subject.** J Ayub Med Coll Abbotabad.2007;19(4):64-7.

21. Bhat VM, Cole JW, Sorkin JD, Woznaik MA, Malacher AM, Giles WH, et al. **Dose-response relationship between cigarette smoking and ischemic stroke in young women.** Stroke.2008;39:2439-43.