Frequency of Cerebral Infraction and Hemorrhage In Stroke and Its Risk Factors

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ABSTRACT

Objective: To know frequency of cerebral infarction and hemorrhage in stroke and its risk factors

METHOD: This descriptive cross sectional study was done at PMC hospital Nawabshah from Jan 2018 to Dec 2018 where 240 stroke patients were studied. Demographic data of patients was collected from attendants. It included age, history of diabetes, hypertension, smoking and cardiac disease. Blood pressure was recorded. After general and neurological examination investigations including CT brain were advised.

RESULT: Out of 240 patients 192 were having infarction (80%) and 48 were having intra cerebral hemorrhage (20%)

Hypertension, smoking, diabetes, cardiac disease and dyslipidemia were risk factors associated with stroke.

CONCLUSION: Cerebral infarction is dominant form of stroke. Hypertension, Smoking, Diabetes, Heart disease and Dyslipidemia are common risk factors for stroke.

KEY WORDS: Stroke, cerebral infarction, risk factors.

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INTRODUCTION: Stroke is defined as acute neurological deficit which lasts for more than twenty four hours. 80 to 85% of causes of stroke are due to infarction. [1] Stroke is second major cause of death after ischemic heart disease worldwide. It is major cause of disability in adults. Those who survive from acute stroke, 31% need assistance in daily living activates, 20% require help during walking and institutional care is required in16%.[2] Stroke not only causes increased mortality and disability but it also causes a great economic burden.[3] Chances of poor outcome after stroke are increased with advanced age, coexistence of diabetes mellitus, ischemic heart disease and size of infarct.[2] Low and middle income countries have highest burden of stroke causing more than 85% mortality due to stroke worldwide. [4] Non modifiable risk factors for stroke are age, sex, race and ethnicity while modifiable risk factors include Hypertension, Diabetes, Cigarette smoking, Dyslipidemia and Heart disease[5] Despite reperfusion therapy for acute ischemic stroke many patients are left with residual disability.[6] Therefore prevention is best strategy for reducing burden of stroke.[7]

With age there is increase in incidence of stroke. After 55 years there is doubling of incidence of stroke for each decade [8] Women at younger ages have higher risk of stroke as compared to men while in old age risk is greater for men. [9]

Higher risk of stroke in women at younger ages is related to pregnancy, post-partum state and use of contraceptives. Blacks have two times more risk of stroke as compared to white and have high mortality due to stroke.[10] This racial difference can be due to high prevalence of hypertension, diabetes mellitus and obesity in blacks [11] Hypertension is most important modifiable risk factor for stroke. It is particularity associated with hemorrhagic stroke though it is also a risk factor for ischemic stroke. With improved recognition and treatment of hypertension frequency of hemorrhagic stroke declines and that of ischemic stroke increases. In addition to drugs, hypertensive patients should engage in life style changes such as increased physical activity and dietary change to reduce burden of hypertension. In diabetes patients there is 2-fold increased risk in stroke and 20% of deaths in diabetic are due to stroke. Physical inactivity is associated with incidence of stroke. Physical activity decrease the risk of

stroke because of reduction in blood pressure, diabetes mellitus and obesity.[12] Diet is also risk factors for stroke. Healthy diet can reduce life time risk of stoke by 20 % [13] excessive intake of salt increase risk of stroke while potassium intake decreases risk of stroke. Diet rich in fruits and vegetables reduces risk of stroke while diet rich in saturated fats and simple sugar increases risk of stroke. Obesity is risk factor for stroke. Obesity increase level of blood pressure, cholesterol and glucose. Increased waist to tip ratio is associated with stroke not body mass index [11] Alcohol use is associated with stroke. Heavy alcohol use causes hypertension and poor control of blood pressure [14] There is 25% to 30% lower risk of stroke in those who are physically active as compared to physically inactive individuals. For prevention of stroke 30 to 40 minutes per day of exercise 3 to 4 days per week is recommended [15]

Objective of this study was to know frequency of infraction and hemorrhaged in stoke and its risk factors.

Patients and Method: This was cross sectional descriptive study. This study was conducted at department of medicine PMC hospital Nawabshah from January 2018 to December 2018. Patients admitted with stroke were studied. Neuroimaging showing tumor, meningitis, and encephalitis and head injury were excluded from study. After taking consent from patients relative history was taken especially about risk factor for stroke like diabetes mellitus, Hypertension, smoking, Heart disease and Dyslipidemia. Then physical examination including cardio vascular and neurological system was performed. After examination investigation like blood glucose, fasting lipid profile, ECG, X-Ray chest, CT scan brain were advised. In few patients' echocardiography and Doppler study of carotids was done. Stroke is defined as rapidly developing symptoms and sign or global loss of cerebral function lasting for more than 24 hours or causing death due to vascular cause. Hypertension was present ifpatient was taking anti hypertension drugs or if average of two systoltic blood pressure reading was > 140mm Hg or diastolic blood pressure was > 90mmhg. [16] Dyslipidemia was present if fasting serum cholesterol was>200mg/dlor triglyceride was more than 150mg/dl or low density cholesterol was> 100 mg/dl [17]. Patient was smoker if he smoked one or more cigarette everyday for more than 6 consecutive months. Patients was considered diabetic if he was taking insulin or oral hypoglycemic drugs or if fasting blood glucose was > 126mg/dl or random blood glucose was >200mg/dl.[18] Cardiac disease was present if there was history of chest pain or dyspnea along with ECG and Echocardiographic finding. Atrial fibrillation was diagnosed by ECG.

RESULT: From Jan 2018 to Dec 2018,240 patients were included in study. Age of patients was 20 to 75 years with mean age 42.5 ± 27.5 years.142 patients were male and 98 female with male to female ratio of 1.4:1. Baseline characteristics are given in table no 1. Out of 240 stroke patients,192 were having cerebral infraction 80% and 48 were having intra cerebral hemorrhage 20%. Hypertension was most common risk factors 114(47%) followed by smoking 60(25%),Diabetes 51 (21%),cardiac disease 45(18%) and hypercholesterolemia 42(17%). Out of 240 patients 60 (25%) patients died. Hemorrhagic stroke had high mortality 39(81%) as compared to ischemic stroke 21(10%).

Table No 1 Demographic Data (n=240)

S.No	Parameter	No of Patients	%
1	Male	142	59
2	Female	98	41
3	Age mean ± SD	20-75 47.5±27.5	

Table No 2 Characteristics of stroke subtypes

	Total	Cerebral Infarction	Cerebral Hemorrhage
N(%)	240	192 (80%)	48 (20%)
Age (Years)	Mean± SD 47.5±27.5		
Male	142(59%)	112 (58%)	30 (64%)
Female	98 (41)	80 (41.6%)	18 (37.5)
Risk Factors			
Hypertension	114 (47)	84 (43%)	30 (62%)
Smoking	60 (25%)	45 (23%)	15 (31%)
Diabetes	51 (21%)	40 (21%)	13 (27%)
Cardiac Disease	45 (18%)	40 (20%)	5 (10%)
Hypercholesterolemia	42 (17%)	35 (18%)	7 (14%)
Death	60 (25%)	21 (10%)	39 (81%)

DISCUSSION:

Out of 240 patients of stroke 192 were having cerebral infarction (80%) and 48 were having intra cerebral hemorrhage (20%). Risk factors associated with stroke were Hypertension, Smoking, Diabetes mellitus, Cardiac disease and Hypercholesterolemia. This study showed that hypertension was most important risk factors for both types of stroke. It was present in 47% of patients with stroke. It was more common in hemorrhagic than in ischemic stroke. This finding of 47% is comparable to proportion of stroke of 54% due to hypertension in inter stroke study. [19] Even in those who are not hypertensive risk of stroke is higher with increasing blood pressure. [20] Blood pressure rises with age and life time risk of developing hypertension is increased. [21] Above 65yearsof age more than two thirds of people are hypertensive. [22] In addition to drugs for hypertension control, Hypertensive patients should be encouraged to engage in life style change such as increased physical activity and diet change to reduce the effect of hypertension. Smoking was risk factors in 25% of stroke patient. This is similar to 19% in other local study. [23] Cigarette smoking is a major risk factor doubling the risk of stroke [24] 15% of all stroke deaths per year are caused by smoking. [25] Cessation of smoking reduces risk of stroke. After 2 to 4 years of smoking cessation, risk of stroke disappears. [26] Diabetes was present in 21% of patients with stroke in this study. It is comparable to 16.6% as reported by Rathore JA etal [27] and 29% by Almani SA etal[28] Diabetic patients have 2-fold increased risk stroke [28] and 20% of death in diabetics are due to stroke. Pre diabetes is also a risk factor for stroke [29] Use of medication and life style change as physical activity in diabetics reduce the risk of stroke. Physical activity reduced blood pressure and controls Diabetes and excess body weight [30] 18% of stroke patients had cardiovascular disease including IHD and atrial fibrillation. Coronary artery disease is risk factors for stroke. Atherosclerosis occurs simultaneously in coronary, carotid and cerebral arteries. [31] Incidence of stroke due to AF has tripled in last three decades. [32] Cardiac cause was associated with ischemic stroke but not hemorrhagic stroke. Dyslipidemia was present in 17% of stroke patients which is similar to 19% reported in other study. [33]

There is complex relationship between dyslipidemia and stroke. Total cholesterol increase causes increased ischemic stroke while elevated high density cholesterol causes decreased ischemic stroke.[32] When LDL cholesterol is reduced by 1 mmol/L there is reduction in ischemic stroke by 20%. Therefore all ischemic stroke patients should get statin therapy [33] However hemorrhagic stroke increase with decrease in total cholesterol level. [34] Statin reduces risk of ischemic stroke. However statin may increase risk of intracerebral hemorrhage in patients with previous hemorrhage, amyloid angioplasty and small vessel disease. [35, 36] Limitation of study is that it was carried out for only one year. Accurate measure of risk factors can be estimated only by large population based study. Another limitation is that body mass index and physical activity were not investigated as risk factors.

CONCLUSION: Cerebral infarction is dominant form of stroke. Hypertension, Smoking, Diabetes, Heart disease and Dyslipidemia are common risk factors for stroke. If these risk factors are detected and interventions are done to control these in early stage then we can reduce the incidence of stroke.

REFERENCE:

1. Safeer M, Tariq M, Rehmanubaidur. Frequency of risk factors of cerebral infarction in stroke patients. A study of 100 cases in Naseerteaching hospital Peshawar Pak J. Med sci Jan-March 2008; 24(1): 109-113
2. Biller J, love BB. Ischemic cerebrovascular disease. In BradelyWG, Daroff, Fenichel GM,Marsden DC, eds. Neurology in clinical practice of diagnosis and management.Philadephia, Butter-worth-heinemann, 2000: 1125-66
3. American heart association.Heart and stroke statistics-2004 update. Dallas, Am heart assoc2004
4. Feign VL stroke in developing countries:can the epidemic be stopped and outcome improved?lancet neural 2007;6:94-97
5. Elkinad MS, Sacco RL. Stroke risk factors and stroke prevention. Semin Neural 1998;18(4):429-40
6. Power WJ, Derdeyn CP,Biller J etal.American heart association/American stroke association focused update of 2013 guidelines for early management of patients with acute ischemic stroke regarding endovascular treatment. A guideline for health care professional from American heart association / American stroke association stroke 2015; 46: 3020-35
7. Sacco RL, Benjamin EJ, Broderick JP Etal.American heart association preventive conference.Prevention and rehabilitation of stroke Risk Factors.Stroke 1997;28: 1507-17
8. Roger VL, Go AS, LL yod Jones DM,Heart disease and stroke statistic-2012 update: A report from American heart Associated Circulation.2012; 125: 188-197
9. Kapral MK, Fang J, Hill MDSilver F, Richards J, Jaigobin C, Cheung AM;Sex difference in stroke care and outcomes: results from registry of Canadian stroke network stroke.2005; 36:809-814
10. Cruz Flores S, Rubinstein A, biller J,Elkind MS,Griffith P,Gorelick PB etal Racial-ethnic disparities in stroke care.Stroke.2011; 42:2091-2116
11. Giles WH Kittner SJ, Hebel JR, losonczy KG, Sherwin RW. Determinants of black-white difference in risk of cerebral infraction. Arch intern Med. 1995; 155:1319-1324
12. Manson JE, Colditz GA,stampfer MJ,Willett WC,Krolew ski AS, Rosner B. Aprospective study of maturity onset diabetes mellitus and risk of coronary heart disease and stroke in women Arch intern Med. 1991; 151:1141-1147
13. Reesk,D yakavaM, Wilson N, Ward K, thoro good M, Bruenner E, Dietary advice for reducing cardio vascular risk Cochrane database syst Rev.2013;CD 002128
14. Rantakomi SHlankkanenJA, Sivenius J, kauhanen J, Kurl S, Alcohol consumption and risk of stroke among hypertensive and overweightmen. J Neurol. 2013; 260:534-539
15. Howard VJ, me donnell MN, physical activity in primary stroke prevention: just do it. Stroke.2015; 46: 1735-1739
16. James PA, Oparils, carter BL etal.Evidence based guideline for management of high blood pressure in adult: report from panel members appointed to the eight joint national committee (JNC8) JAMA 2014; 311:507-20
17. Joint committee for developing chines guidelines on prevention and treatment of dyslipidemia in adults.Chines guidelines on prevention and treatment of dyslipidemia in adultszhonghuaXinXueGuan Bing ZaZhi 2007; 35:390-419.
18. American diabetes association.Diagnosis and classification of diabetes mellitus. Diabetes care 2013; 36: S67-74 doi: 10.2337 dc 13-5067
19. O Donnell MJ, Xavier D, Liu L etal. Inter strokeinvestigators. Risk factors for ischemic and intra cerebral hemorrhage stroke in 22 countries (the inter stroke study) a case control study.Lancet 2010; 376: 112-123
20. StansburyJP, Jia H William LS, vogel WB Duncan PW.Ethnic disparity in stroke: epidemiology,acute care, and postacute outcome.stroke.2005; 36: 374-386
21. Vasan RS, Beiser A, seshadri S, Larson MG, kannel WB, DAgostino RB levy D. Residual lifetime risk for developing hypertension in middle age women and men: Framingham heart study JAMA 2002; 287: 1003-1010
22. Chobanian AV, Bakris GL, Black HR, Cushman wc,Green LA, izzo JL etal. The seventh report of joint national committee on prevention,detection,evaluation and treatment of high blood pressure. JNC report JAMA 2003; 289: 2560-2572
23. Almani SA, Rahopata MQ, Baloch GH etal.Stroke: frequency of risk factors in patients admitted at liaquatuniversity

hospital Hyderabad JLUMHS Sept –Dec 2008
24. Amelia k Boehme,Charles Esenwa, Mitchell S.V.EL kind.Stroke risk factors genetics and prevention. CircRes 2017; 120: 472-495
25. Thun MJ, Apicella LF, Henley SJ, smoking vs other risk factors as a cause of smoking-attributable death: confounding in courtroom JAMA.2000;284: 706-712
26. Song YM, cho HJ. Risk of stroke and Myocardial infarction after reduction or cessation of cigarette smoking: a cohort study in Korean men: stroke. 2008; 39: 2432-2438
27. Rathore JA, Kango ZA, Nazir M, Mehraj A. Risk factors for stroke. A prospectivehospital based study J Ayub Med collAbbottabad 2013; 25(1-2)
28. SuixLavie CJ, Hooker SP, Lee DC, Cola bianchiN,Lee CD, Blair SN. A prospective study of fasting plasma glucose and risk of stroke in asymptomatic men. Mayo clin proc. 2011; 86: 1042-1049
29. Manson JE, cold itz GA, stampferMJ etal. A prospective study of maturity onset diabetes mellitus and risk of coronary heart disease and stroke in women Arch intern Med 1991; 151: 1141-7
30. Copstein L, Eemandes JG, BastosGA. Prevalence and risk factors in apopulation of southernBrazi.Arqneuro-psiquiatr2013 May 71(5): 294-300
31. YiinGS, Howard DP, Paul NL,LiL, Luengo-Fernandez R,BuIILM, welch SJ, Gut nikov SA, Mehta Z,Rothwell PM. Age specific incidence outcome,cost and projected future burden of atrial fibrillation-related embolic vascular events: A population based study.Circulation.2014; 130: 1236-1244
32. Sacco RL, Benson RJ, Kargman DE, Boden-AlbalaB. Tuck C, Lin IF etal.High densitylipo protein cholesterol and ischemic stroke in elderly northern Manhattan stroke study JAMA. 2001; 285: 2729-2735
33. AmarencooP, Labrenche J lipid management in prevention of stroke lancet Neurol. 2009;8: 453-463
34. Lribarren C, Jacobs DR, sadler M, Claxton AJ, Sidney S.Low total serum cholesterol and intra cerebral hemorrhagic stroke is the association confined to elderly men? The Kaiser Permanente medical care program.Stroke 1996; 27: 1993-1998
35. Lauer A, Greenberg SM, gurol ME, Statinin intra cerebral hemorrhage.CurrAtherosclerRep 2015;17:46
36. Goldstein LB, Amarenco P, Szarek M,Callanhan A 3rdhemorrhagic stroke in stroke prevention by aggressive reduction in cholesterol levels study.Neurology 2008; 70: 2364-2370