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A Study on the Clinical Profiles of Patients with Cerebrovascular Accident (Stroke) in a Tertiary Care Hospital in Srinagar, Jammu And Kashmir

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Abstract

Introduction: Stroke is a severe cerebrovascular illness that leaves a large degree of residual impairment. In India, the prevalence of stroke is on the rise. In-depth research is required to assess risk variables.

Materials and methods: The objective of this cross-sectional study was to evaluate the clinical profile of stroke patients by collecting patient demographics, noting comorbidities, and performing laboratory testing.

Observation: The most common age group who presented with stroke was 60-85 years, followed by 41-60years.Hemorrhagic stroke was more common (57%) than ischemic stroke (43%).Male patients were more than female patients. Hypertension, Diabetes, Smoking, Anemia, CKD, Dyslipidemia, CAD, Thyroid, AF were present in the study group.

Conclusion: Regular evaluation of blood pressure, blood sugar, lipid profile should be routinely done in patients with diabetes and hypertension who are more than 60 years old.

Keywords: Diabetes, Smoking, Anemia, CKD, Dyslipidemia.

Introduction

Stroke, or cerebrovascular accidents, is a major cause of death and long-term disability and an epidemic in world health. The term "stroke: was probably first used in medicine by William Cole in A Physico-Medical Essay Concerning the Late Frequencies of Apoplexies, published in 1689. [1]. A transient ischemic attack is characterized as a brief period of localized ischemia of the brain, spinal cord, or retina that does not result in an acute infarction [2]. Hemorrhagic stroke and ischemic stroke are the two forms of cerebrovascular accidents, or strokes. Increased age, a history of stroke or transient ischemic attack, high blood pressure, smoking, diabetes mellitus, high cholesterol, and a trial fibrillation/flutter are all linked to an increased risk of stroke [3].

Because abnormal blood glucose levels and changed lipid profiles are frequently linked to stroke, they should be taken into account for improved secondary

prevention.[4]Transient ischemic attacks provide an opportunity to prevent strokes that physicians encounter. Transient ischemic attacks should be treated as a medical emergency, as up to 80% of strokes after transient ischemic attacks are preventable [5].

Hypertension is the most important modifiable risk factor for stroke. Appropriate reduction of blood pressure is necessary for stroke prevention, even more important than the choice of antihypertensive drugs. Lifestyle factors that have been proven to decrease stroke risk include reducing salt intake, ceasing smoking, performing regular physical activity, and maintaining a normal body weight [6]

Age has been the strongest risk factor for both ischemic and hemorrhagic stroke, and its incidence doubles with each successive decade after the age of 55 years. However, there is a considerable portion of patients with significant cerebrovascular disease but without any of these stroke risk factors, leading to the hypothesis that there may be other factors that have not been identified yet that may improve diagnosis and treatment strategies and reduce the related public health burden [7].

A variety of additive risk factors and causes contribute to the heterogeneity of stroke as a disease. The major burden of stroke in an aging population is significantly reduced via primary prevention of stroke, which is associated with risk factor management. The primary focus of secondary prevention of recurrent strokes is on the workup and customized treatment aimed at the processes causing the stroke or transient ischemic attack [8].

For young patients, hypertension—specifically, systolic blood pressure—is the most frequent risk factor for stroke. For middle-aged patients, the risk factors include diabetes and hypertension; for elderly patients, the risk factors are alcohol use, dyslipidemia, diabetes, and hypertension [9].

Among all the neurologic diseases of adult life, stroke ranks first in frequency and importance .The common mode of expression of stroke is a relatively sudden occurrence of a focal neurological deficit. Strokes are broadly categorized as Ischemic stroke and Hemorrhagic stroke. Ischemic stroke is due to occlusion of cerebral blood vessel and causes cerebral infarction .One of the three main processes is usually operative:

1. Atherosclerosis with superimposed thrombosis affecting large cerebral blood vessels.
2. Cerebral embolism
3. Occlusion of small cerebral vessels within the parenchyma of brain .Other pathological processes may include arterial dissection, hyper coagulablestates and vasospasm.

Materials and Methods

In a tertiary care hospital, a cross-sectional observational research was carried out. Patients having a diagnosis of cerebrovascular accident made both clinically and radiologically (using non-contrast brain CT) were included in the research. 100 patients in total were accepted based on the inclusion and exclusion criteria. The World Health Organization defines a stroke as & quote rapidly developed clinical signs of focal (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than of vascular origin & quot. This definition is used to describe stroke.

Inclusion criteria

This study included all patients who are hemodynamically stable and do not require ventilatory care, as well as those who were hospitalized after being diagnosed with stroke based on clinical and radiological evidence and who were older than eighteen years.

Additionally, we only included patients and/or guardians who provided their consent (Table 1).

Table 1: Inclusion Criteria

Age(years)	>18
Diagnosis criteria	Clinical and radiological
Hemodynamic status	Stable
Consent status	Those who gave consent

Exclusion criteria

Age(years)	<18
Pregnancy status	Pregnant
Hemodynamic status	Unstable
Cause of Stroke	Trauma
Type of stroke	Transient Is chemic attacks

After obtaining their agreement, patients who were hospitalized with clinical and radiologic diagnoses of stroke and who met the inclusion and exclusion criteria were included in the research. Clinical examinations were performed on the patients. Every patient had a medical history about comorbidities, which was used to check for previous instances of diabetes, hypertension, lipid problems, etc. Demographic details were recorded, including the patient's age, gender, and history of drunkenness or smoking. On the day the patient was admitted, laboratory investigations were submitted to the laboratory.

Results

The purpose of the study was to evaluate the clinical characteristics and risk variables of individuals who had suffered cerebrovascular accidents (strokes). During their hospital stay, 100 stroke patients who met the inclusion and exclusion criteria were chosen for this study and given assessments. Patients who were 18 years of age or older were included in this study. The age group that presented with stroke most frequently was60–85 years old, followed by 41–60 years old.

Table 3 shows the distribution of sociodemographic risk factors for stroke in males and females .Of 100patients, 61(61%) were male and 39(39%) were female. Out of 100 patients, 57(57%) had hemorrhagic stroke and 43(43%) had ischemic stroke .Out of 57 hemorrhagic stroke patients, 46(46%) were male and11 (11%) were female .Out of 43 ischemic stroke patients, 15(15%) were males and 28(28%) were females.

Table 3: Sociodemographic risk factors

Sociodemographic factors	Risk	Ischemic stroke (N=43)	Hemorrhagic Stroke (N=57)
Sex	Male	15(34.88%)	46(80.72%)
	Female	28(65.11%)	11(19.2%)
Age	<60yrs	6(13.9%)	3(5.26%)
	>60yrs	37(86.04%)	54(94.7%)
Smoking		24(55.8%)	41(71.92%)

Out of 57 patients with hemorrhagic stroke, 50 were of intraparenchymal hemorrhage and 7 were of Subarachnoid hemorrhage .Out of 43 patients with ischemic stroke,37 were due to vascular cause,6 due to A trial Fibrillation. Out of 100 patients, 58% were known case of Hypertension. Out of 43 ischemic stroke patients 25 (58.13%) had hypertension .Out of 57 hemorrhagic stroke patients, 33 (57.8%) had hyper tension .Out of 58 patients,25 had ischemic stroke and 33 had hemorrhagic stroke. Among 100 patients with stroke, 39 were in prediabetic range and 35 were in diabetic range. Out of 43Ischemic stroke patients, 32(74.41%) had diabetes .Out of 57 hemorrhagic stroke patients, 17(39.53%) had diabetes. In case of ischemic stroke ,out of 10 male patients,5(50%) were in Pre-Diabetic range and5(50%)were in diabetic range .Out of 22 female patients with ischemic stroke,7(31%)were in Pre-diabetic range and 15(68%) were in diabetic range .In case of Hemorrhagic stroke, out of 14 male patients,8(57%)were in pre-diabetic range and 6(42%) were in diabetic range .Out of 3 female patients, 2(66.66%) were in pre-diabetic range and 1(33.33%) were in diabetic range.

The mean hemoglobin level was 11.9g/dl with a standard deviation of 2.14g/dl .In ischemic stroke patients, out of 43 patients, 7(16.27%) had anemia .Out of these 7 patients, 3 were Male and 4 were female. In stroke patients, out of 57 patients, 4(7.01%) had Anemia (Table 4).Out of these 4 patients 3 were Male and 1 was female.

Table 4: Medical risk factors

Risk Factors	Ischemic Stroke(N=43)	Hemorrhagic Stroke (N=57)
Diabetes	32(74.41%)	17(39.53%)
Hypertension	25(58.13%)	33(57.8%)
A trial Fibrillation	17(39.53%)	0(0%)
Dyslipidemia	10(23.5%)	10(17.54%)
CAD	17(39.53%)	5(8.77%)
Anemia	7(16.9%)	4(7.0%)
CKD	8(18.6%)	6(10.5%)
Thyroid	9(20.9%)	7(12.28%)
CLD	0(0%)	1(1.75%)

CAD=Coronary Artery Disease

CKD=Chronic Liver Disease

Table 5 shows that out of 43 ischemic stroke patients,7 had stage 1 kidney disease,9 had stage 2 kidney disease,5 had stage 3A kidney disease,4 had stage 3B kidney disease,6 had stage 4 kidney disease and 12 had end-stage renal disease(ESRD).

Out of 57 hemorrhagic stroke patients, 3 had stage 1 kidney disease,5 had stage 2 kidney disease,11 had stage 3A kidney disease,6 had stage 3B kidney disease,7 had stage 4 kidney disease and 25 had end-stage renal disease (ESRD).

Table 5: Kidney disease stages (based on eGFR)

Stage	Ischemic Stroke (n=43)	Hemorrhagic Stroke(n=57)
Stage1	7(16.27%)	3(5.26%)
Stage2	9(20.93%)	5(8.77%)
Stage 3A	5(11.6%)	11(19.29%)
Stage 3B	4(9.30%)	6(10.5%)
Stage 4	6(13.95%)	7(12.28%)
Stage 5	12(27.90%)	25(43.85%)

Stage 1 involves either healthy kidneys or kidney damage with a normal or high GFR, with an eGFR of >90 mL/minute/1.73 m^2.

Stages 2 and 3A and 3B involve eGFRs of 60-89 mL/minute/1.73 m2, 45-59 mL/minute/1.73 m^2, 30-44 mL/minute/1.73 m2, 15-29 mL/minute/1.73 m^2, and <15 mL/minute/1.73 m^2. Estimated glomerular filtration rate, or eGFR.

Discussion

Age is a significant determinant because the majority of stroke patients were between the ages of 61 and 80 years , with a preponderance of male patients. Ischemic stroke was less prevalent (43%) than Hemorrhagic stroke (57%).A meta-analysis conducted by Pan et al. revealed that there is no correlation between the incidence of stroke and past smoking, and that there is a relationship between stroke of any kind and current smoking status, regardless of gender. These findings suggested that quitting smoking has a beneficial impact on the incidence of stroke [11]. In several of the patients in this investigation, risk factors such, smoking, a trial fibrillation, and coronary artery disease were present. The most significant modifiable risk factor for stroke is hypertension, which has been linked to almost half of all strokes globally [12]. Blood can get stagnant due to a trial fibrillation and flutter, especially in the left a trial appendage. This can result in thrombus development and embolization of the cerebral or systemic circulation. Those with both paroxysmal and persistent a trial fibrillation has an increased risk of cardio embolic ischemic stroke [13]. The most significant modifiable risk factor for stroke is hypertension, which has been linked to almost half of all strokes globally.[14] We found that a considerable proportion of stroke patients had diabetes and hypertension. Uncontrolled blood pressure was present in many of the hospitalized patients (majority in stage 2 hypertension.

The American Diabetes Association advises screening for prediabetes or diabetes in all at-risk patients and individuals over 45 by measuring fasting blood sugar, glucose tolerance, or A1Clevels [15]. In conclusion,

irrespective of traditional cardiovascular risk factors, hypertension and/or diabetes have been substantially linked to an increased risk of combined vascular events and stroke. Compared to diabetes, hypertension is associated with a noticeably greater risk of stroke and combined vascular events [16].Sixty-three percent(63%) of the patients in our research also had anemia, which might be related to dietary deficiencies because the majority of the patients had renal illness and poor socioeconomic level. Anemia has often been linked to a hyperkinetic condition that modifies the genes encoding endothelium adhesion molecules, resulting in the production of thrombus. Furthermore, this thrombus may migrate due to increased blood flow and turbulence, which might result in artery-to-artery embolism [17]. Additionally, several multifocal and bilateral cerebral infarcts and lesions in both the anterior and posterior circulation zones have been found by MRI of stroke patients with iron deficiency anemia. These results corroborate the theory that widespread ischemia damage in brain watershed regions is caused by anemic hypoxia [18]. Dayimu et al. suggested that long term decreasing hemoglobin levels might increase the risk of stroke [19].The entire spectrum of cerebrovascular illness, such as ischemic and hemorrhagic stroke, small vessel disease, and vascular cognitive impairment, is highly correlated with chronic kidney disease (CKD) [20]. Dad and Weiner discovered that ischemic stroke and hemorrhagic stroke subtypes had separate risk factors in chronic renal illness. Compared to the general population, patients with end-stage renal disease getting renal replacement treatment have a four- to ten-fold increased risk of stroke, and during the first year of dialysis, this risk increases by a factor of seven[21]. Hospitalization for coronary disease, heart failure, stroke, or peripheral arterial disease was considered a cardiovascular event. Go et al.'s study discovered an independent graded connection between renal function and cardiovascular events [22]. In a population-based cohort analysis, Bos et al. discovered that reduced glomerular filtration was a significant risk factor for hemorrhagic stroke, as opposed to ischemic stroke[23]. According to Lee et al., those with an estimated glomerular filtration rate of less than 60 mL/minute/1.73 m2 had a higher incidence of stroke risk, but not those with a glomerular filtration rate between 60 and 90 mL/minute/1.73 m2 [24]. According to Tsahalis et al.'s study, almost 28% of acute stroke patients who were hospitalized for the first time had moderate or severe renal impairment, which is defined as a glomerular filtration rate of ≤30 mL/minute/1.73 m.[25]. In a prospective trial, Abramson et al. discovered that individuals with both CKD and anemia had a significantly higher risk of stroke, even in the absence of other established risk factors. [26]. The majority of the patients in our research also had stage 2 or stage 3A renal disease, which increases blood pressure and accelerates atherogenesis, both of which are risk factors for cerebrovascular accidents. Certain individuals also had dyslipidemia, which increases the risk of cerebrovascular accidents. In several cases, dyselectrolytemia was also present at the time of admission. Numerous individuals in this research had age, proteinuria, diabetes, hypertension, and dyslipidemia. Despite all of the good intentions, there are still limits to this study. The size of the study's sample was modest. Hospital bias cannot be completely ruled out because this study was limited to a single center at a tertiary care hospital. The lockdown and the continuing COVID-19 epidemic have further hampered the study.

Conclusion

The current study suggests that individuals over 40 should be screened for hypertension, diabetes,

dyslipidemia and proteinuria, and that instances that have already been identified should be closely monitored. To reduce the risk of stroke, a trial fibrillation should be managed and early intervention implemented. To avoid stroke, heavy drinking and smoking should be prevented. Many people have diabetes and hypertension that are not recognized. Larger research projects are required in order to have a deeper comprehension of risk factors.

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