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Stroke in Young Patients - A New Trend in Nepalese Perspective?

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Abstract

Background: Stroke is caused by the loss of blood supply to the brain, commonly known as cerebral vascular accident (CVA). Strokes in younger people (below 45 years) are not common as it usually occurs in the middle-aged and elderly. The absolute definition of stroke in young does not exist, however conventionally "young stroke" is considered for people below 45 years.

Objective: To analyse the trends in occurrence, risk factors, etiology and neuroimaging features of ischemic stroke in young adults.

Methods: In this study the records of 281 strokes patients were reviewed, out of which 33 were young patients admitted to Neurology ward of College of Medical Sciences, Bharatpur, Nepal from 1st January to 31st December 2013. The records were analysed on the basis of age, sex, hypertension (HTN), body mass index (BMI), smoking habits, haemoglobin (Hb), diabetes mellitus (DM), lipid profile, atrial fibrillation (AF) and vascular territory with clinical and radiological evidences.

Results: Most of the young stroke patients were between 40-45 years. Ischemic stroke was noted in 87.8%and haemorrhagic stroke was noted in 12.2% of patients. Middle cerebral artery (MCA) ischemia was noted in 57.6% of patients and anterior cerebral artery (ACA) ischemia was noted in 3% of patients. Multiple infarcts were noted in 9.1% of patients. About half of them were smoker, hypertension 42.4%, diabetes mellitus 18.2% and 9.1% had atrial fibrillation.

Conclusion: The stroke is also seen in young people below 45 years. The common risk factors like smoking, Hypertension and Diabetes are increasingly recognized in young patients.

Keywords: Young stroke; Risk factors

Introduction

Stroke is caused by lack of blood supply to the brain Stroke is the second most common cause of death and major cause of disability worldwide [1]. Middle-aged group are commonly affected by stroke. Stroke consequences with respect to quality of life and ability to work especially in younger age are often poor. We don't have the data of stroke in young patients from Nepal. The National Survey of Stroke revealed that only 3.7% of all CVA that occurred in patients aged between 15-45 years [2].

The absolute definition of stroke in young patients doesn't exist, however conventionally "young stroke" is considered for people below 45 years old. This article tries to identify types, risk factor and distributions of stroke in patients below 45 years of age.

Subjects and Methods

The medical records of the patients with the diagnosis of stroke admitted to the Neurology ward at the College Medical Sciences Bharatpur, Nepal from 1st January 2013 to 31st December 2013. The diagnosis of stroke was made in these patients as WHO [3].

The total numbers of patients admitted with diagnosis of stroke during the mentioned period were 281 and out of which 33 were young patients. The records of these 33 patents were analyzed to identify age, sex, and hypertension, Body mass index, smoking habits, hemoglobin, diabetes mellitus, lipid profile, atrial fibrillation and vascular territory on the basis of clinical and radiological evidences.

The data were analyzed the data using SPSSV 20.

Results

A total of 33 young patients were admitted during the mentioned period.

Baseline characteristics of the stroke patients below 45 yrs, from medical record (Tables 1, 2 and 3) Figure 1.

Discussion

Stroke is one of the major causes of disability worldwide [1]. Furthermore, stroke in young patient will have much more impact in

Particulars of the patients	Characteristic features
Age	18-45 yrs
Sex	M:F; 15:18
Systolic Blood Pressure	134 ± 27 mmHg
Diastolic Blood pressure	84.55 ± 1 8 mm Hg
Pulse	76.9091 ± 9 beats/min
Height	1.5624 ± 0.138 cm
Weight	58.18 ± 101 kg
Body mass index	23.32 ± 4.54 kg/m^2
Haemoglobin	12.82 ± 2.59 gm/dl

Table 1: Baseline characteristic of patient with stroke below 45 yrs of age. Mean Systolic Blood pressure 134 ± 27.62 mmHg, Mean Diastolic Blood Pressure 84.55 ± 18.8 mmHg, Pulse means 76.9091 ± 9.02 beats/min, Height means 1.5624 ± 0.138 cm, Average weight 58.18 ± 10.1 kg, Body Mass Index mean 23.32 ± 4.54 Kg/m^2 was observed.

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Risk factors	Frequency	Percentage
Smoking	16	48.5%
Diabetes Mellitus	6	18.2%
Hypertension	14	42.2 %
Triglycerides >150	12	36.4%
High Density Lipoprotein <40	17	51.5%
Atrial fibrillation	3	9.10%

Table 2: Risk factors distribution. Smoker 16 (48.5%), Diabetes Mellitus 6 (18.2%), Hypertension 14 (42.4%) Triglycerides >150=12 (36%), High density lipoprotein 1-39=17 (51.5%), Atrial Fibrillation 3 (9.1%).

Areas of Brain	Frequency	Percentage
Ischemic Middle Cerebral Artery	19	57.6%
Ischemic Anterior Cerebral Artery	1	3%
Ischemic brain stem	3	9.1%
Ischemic Cerebellum	2	6.1%
Thalamic infract	1	3%
Multiple infract	3	9.1%
Basal ganglia Bleed	2	6.1%
Brainstem Bleed	2	6.1%

Table 3: Distribution of stroke according to arterial supply. Ischemic stroke were 87.8%, Middle Cerebral Artery ischemia 19 (57.6%), Anterior Cerebral Artery ischemia 1(3%), Brain stem ischemia 3 (9.1%), Cerebellar Ischemia 2 (6.2%), Multiple infarct 3 (9.1%), Thalamic infarct 1(3%), Hemorrhagic stroke were 12.2% Basalganglia bleed 2 (6.1%) Brain stem bleeds 2 (6.1%).

the productivity of life. The trend of stroke cases in last four decades worldwide shows that in developing countries, the rate of incidence of stroke is rapidly increasing, by almost 100%. Disability due to stroke is almost seven times as much as that of developed countries which can be due to lack of sufficient resources [4].

This study includes the age limit of people who were less than 45 years old as young patient, which is similar with many other studies. However, the Helsinki Young Stroke registry examined etiology in adults less than 49 years of age [5].

In the present study female patients were more than male patents during the afore mentioned period; this can be due to indoor pollution, which females are more exposed than males in developing country like Nepal. Moreover, rheumatic heart disease is also more common in females than males.

Smoking is a well-established factor for vascular diseases. In this study, nearly half of the patients (48.5%) were smokers. In one of study, the risk increased to six fold when population was compared with nonsmokers who had never been exposed to environmental tobacco smoke [6].

A cardiogenic cerebral embolus is one of the most common causes of stroke in the young adults, accounting for up to one third of the cases [7,8]. Contrary to our findings which show only 9% of cases were cardio-embolic stroke. Mitral valve disease, which accounts for a significant proportion of cardio-embolic stroke in young patients, is more common in some populations due to a high prevalence of rheumatic heart disease [9].

Hypertension is a major risk factor for vascular diseases and stroke. In our study, 42.5% of young patients had hypertension; similar with the finding published from Jerusalem that had 42% hypertension [10]. Hypertension is the most important modifiable risk factor for stroke. Likewise, diabetes mellitus was seen in 18% of our young patients. It was interesting to find that these risk factors were seen in the younger patients in Nepalese context. Louis et al. found diabetes in 27% of the ischemic non embolic stroke cases [11]. This increasing tendency of diabetes mellitus in young adults could be the result of changes in lifestyle and eating habits of the young people.

The lipids are involved in the process of atherogenesis. In present study the high-density lipid (HDL) level was less than 40 in more than half of the patients. Higher levels of HDL cholesterol were associated with a significant decrease in risk of nonfatal stroke [11].

An increased risk of cerebral infarction among young adults with conventional vascular risk factors is observed, particularly in

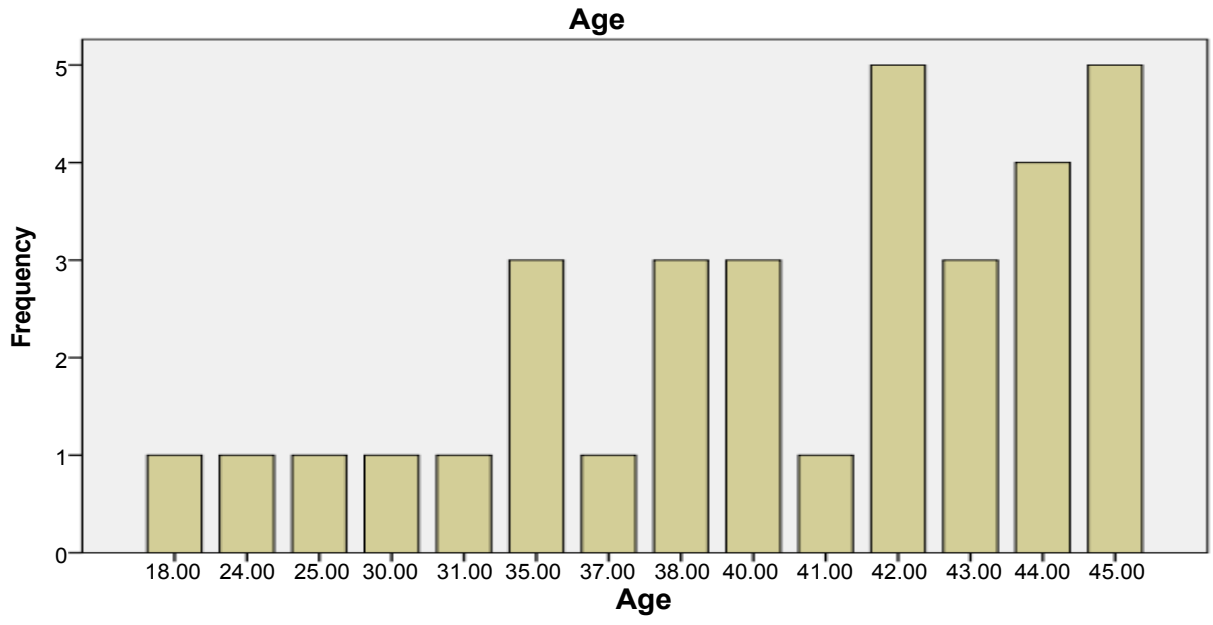

Figure 1: Age distribution of stroke patients below 45 yrs. Maximum numbers of patients were between 42 to 45 years of age.

developing countries due to increasing smoking rates and urbanization [12]. Premature cerebral atherosclerosis is generally the result of risk factors for cerebrovascular disease such as hypertension, diabetes mellitus, and hyperlipidemia and smoking.

Atrial fibrillation (AF) is the most powerful and treatable cardiac precursor of stroke. The incidence of atrial fibrillation in our study was 9%. Atrial fibrillation is associated with more severe ischemic stroke than the diseases from carotid artery [13].

The middle cerebral artery (MCA) is the largest of the intracerebral vessels and supplies through its pial branches almost the entire convex surface of the brain, including the lateral frontal, parietal, and temporal lobes ;insula; claustrum; and extreme capsule. The lenticulostriate branches of the Middle Cerebra Artery supply the basal ganglia, including the caudate, the putamen, the lateral parts of the internal and external capsules, and sometimes the extreme capsule [14].

The distributions o f major ischemic s troke were in the MCA territory. In this study the middle cerebral artery infarct was 57.6%. The MCA is the most common site for the occurrence of ischemic stroke. 14 Cerebral infarcts in the territory of the anterior cerebral artery (ACA) are infrequent and yet few studies have specifically assessed the clinical characteristics of stroke patients with ACA infarction [15].

In our analysis hemorrhagic strokes were 12.2%. In hemorrhagic stroke, bleeding occurs directly into the brain parenchyma. The usual mechanism is thought to be leakage from small intracerebral arteries damaged by chronic hypertension. Hemorrhagic stroke is less common than ischemic stroke (i.e., stroke caused by thrombosis or embolism); epidemiologic studies indicate that only 8-18% of strokes are hemorrhagic [16].

Conclusion

Stroke in young adults is in increasing trend. The distribution of ischemic and hemorrhagic stroke is almost similar with that of adult's stroke patients. The common risk factors like smoking, hypertension and diabetes are increasingly recognized in young patients. Our study was based on a small sample. Further studies can be conducted in a larger sample to assess various other risk factors.

Limitation of this Study

The sample size is small because the stroke in younger populations of than 45 yrs is relatively rare.

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