Original article

Stroke Admission to Tikur Anbassa Teaching Hospital: With Emphasis on Stroke in the Young

Bekele Alemayehu, Kebede Oli

Abstract

Background: Although the burden of cerebrovascular accident is not known in Africa, including Ethiopia, it s a frequent cause of mortality and morbidity in hospital practice. Stroke in the young is associated with different spectrum of risk factors and treatment outcome as compared to stroke in the older age group.

Method: To assess potential risk factors associated with stroke; and to compare the types and frequencies of these potential risk factors among stroke in the young and stroke in the older age groups, a retrospective case study of all stroke patients admitted to Tikur Anbassa Teaching Hospital over six years period, September 1990 to August 1996, was undertaken.

Results: Two hundred and fifty nine patients satisfying the definition of stroke were admitted to Tikur Anbassa Teaching Hospital. Stroke in the young accounted for 28% (73 patients).

Hypertension was the commonest risk factor among both age groups. Rheumatic heart diseases (RHD) was the second commonest risk factor after hypertension present in 29% of stroke in the young while it was absent in the older age. All the RHD cases had mitral valve involvement (mainly mitral stenosis), nearly all having milder forms of the disease. Only 9 of 21 patients with RHD had established atrial fibrillation.

Conclusion: Rheumatic heart disease is an important risk factor among stroke in the young and type of valve involved rather than severity of disease is related to occurrence of stroke. If confirmed on subsequent prospective studies this finding will have an impact on indication for anticoagulation in RHD. [*Ethiop.J.Health Dev.* 2002;16(3):309-315]

Introduction

Cerebrovascular accident is the third leading cause of death after ischaemic heart disease and cancer in the developed countries (1). Although burden of Cerebrovascular accident (CVA) is not well known in Africa, including Ethiopia, it is a frequent cause of mortality and morbidity in hospital practice (2-4). According to some studies (5,6) stroke in the young (i.e. 15-44 years) is associated with different spectrum of risk factors and treatment outcomes as compared to stroke in the older age category (7). Considerable proportion of patients is expected to be in this age category, although stroke in the young has not been specifically addressed in Ethiopia.

In this study, analysis of stroke admissions to Tikur Anbassa Teaching Hospital (TAH) adult wards over a six-year period will be undertaken with objectives of assessing types and frequencies of potential risk factors associated with stroke and its treatment outcomes. Types and frequencies of potential risk factors and outcomes of treatment will be compared between stroke in the young and stroke in the older age groups. The findings of this study may form the basis for future studies that will impact on prevention and management of stroke.

Method

Records of all stroke patients identified from patient registration books of adult medical wards of Tikur Anbessa Teaching Hospital (TAH) over the six-year period (September

Department of Internal Medicine, Faculty of Medicine, Addis Ababa University, P.O. Box 9086, Addis Ababa, Ethiopia

1990 - August 1996) constituted the study subject. Only patients satisfying clinical picture of stroke (i.e. neurologic deficit of sudden onset, which persisted for at least 24 hours or resulted in death of the individual (8) were considered for analysis.

Two hundred and eighty nine consecutive cases of stroke were identified from patient registration books. Out of these, 259 medical records (89.9%) satisfying the criteria of stroke were available and were the only ones considered for subsequent analysis. Age, sex, clinical profiles, potential risk factors, and outcome of treatment were recorded for each patient on prepared form. Types and frequencies of potential known risk factors among the two age categories (i.e. stroke in the young and stroke in the older age group) were compared using appropriate statistical methods. Depending upon its distribution mean (SD) or median (IQR) was estimated for continuous variables. For data not normally distributed their median values were compared, using Wilcoxon ranksum test.

Definition: Stroke in the young is defined as stroke occurring between the ages of 15 and 44 years (5,9).

Results

Two hundred and fifty nine patients satisfying the definition of stroke were available for analysis. The mean (+ 5D) age for the whole patient group was 52 +16 years (median 52 years). Overall, females were younger than males (median 50 versus 55 years; $P<0.05$). The sexes were equally distributed (male 49.8%) among the admissions. As shown in Table 1, stroke in the young constituted 28% (73 patients) of all stroke admissions. Females constitute two–thirds (48 patients) of stroke in the young category, unlike the older age where

Table 1: **Frequency of potential risk factors among stroke categories at TAH, 1990-96**

Variable N (%)	Stroke in the Young			Stroke in the old age			Total %
	Male	Female	Total	Male	Female	Total	
Number (%)	25(34.3)	48(65.7)*	73(100)	104(55.9)	82(44.1)*	186(100)	259(100)
Hypertension	16(64)	18(37.5)	34(46.6)*	65(62.5)	71(86.6)	136(73.1)*	170(65.6)
RHD	2(8)	19(39.6)	21(28.8)	0	0	0	21(8.1)
Diabetes	2(8)	1(2.1)	3(4.1)	9(8.7)	10(12.2)	19(10.2)	22(8.5)
Atrial fibrillation	1(4)	8(16.7)	9(12.3)	3(2.9)	10(12.2)	13(7.0)	22(8.5)
Cigarette Smoking	4(16)	0	4(5.5)	10(9.6)	0	10(5.4)	14(5.4)
Infection	4(16)	1(2.1)	5(6.8)	7(6.7)	7(8.5)	14(7.5)	19(7.3)
Hormonal Contraception		3(6.3)					3(1.2)
Head Injury	0	0	0	0	2(2.4)	2(1.1)	2(0.8)

Pregnancy	1	1

Legend : * = Statistically significant

Table 2: **Characteristics of rheumatic heart disease patients developing stroke, 1990-96, TAH**

Legend: MS = Mitral stenosis
MR = Mitral regurgitation
AF = Atrial fibrillation
IE = Infective endocarditis
I = Discharged improved

female patients accounted for 44.1% (82 patients) of the cases. The difference in gender distribution among the stroke categories is statistically significant ($P<0.05$).

Within the stroke in the young category, the median age of female is statistically lower than their male counterparts (30 versus 39 years; $P<0.05$). Median age of females in the older age stroke is, however, slightly higher than males (60 versus 58 years), though not statistically significant.

Hypertension, although much more frequent in the older age group, was the most frequently identified risk factor in both stroke categories, Table 1. Rheumatic heart disease (RHD) was the second commonest risk factor present in 28.8% of stroke in the young group. No case of RHD was detected in the older age group. Nine of twenty-one (42.9%) rheumatic heart disease patients had associated atrial fibrillation. Except for two all RHD patients were females.

All twenty –one cases had mitral stenosis. Six of the twenty one patients had additional mitral regurgitation. Nearly all rheumatic heart disease patients had milder forms of the disease, being in NYHA functional class II or I. Diagnosis of infective endocarditis was made in six of the RHD cases, (Table 2). All stroke cases associated with rheumatic heart disease were discharged from the hospital improved. There were thirteen additional patients with atrial fibrillation not associated with valvular heart disease .All thirteen patients were in the older age category. Characteristics of patients with atrial fibrillation are given in Table 3.

No	Age	Sex	Type of valve lesion	NYHA Class	Other risk factors	Outcome
1	30	F	MS	I		I
2	30	F	MS	I		I
3	29	F	MS		AF	
4	23	F	MS	I IV		I I
5	32	F	MS		AF,Pneumonia	
6	26	F	MS	II I		I I
7	25	F	MS	II		I
8	24	F	MS,MR	II		I
9	25	F	MS	I	IE	I
10	24	F	MS,MR	I	AF,IE	I
11	15	F	MS	II	IE	I
12	20	F	MS	I	IE	I
13	25	M	MS,MR	I	AF,IE	I
14	39	M	MS,MR	I		I
15	18	F	MS,MR	II		I
16	18	F	MS	II	AF,IE	I
17	22	F	MS	II	AF	I
18	34	F	MS	II		I
19	39	F	MS	II	AF	I
20	39	F	MS	I	AF	I
21	40	F	MS,MR	I	AF	I

Table 3: Characteristics of patients with atrial fibrillation developing stroke, TAH 1960-96.

	Stroke categories				
	Stroke in the young		Stroke in the older age		
Risk Factor	Number	Died in hospital	Number	Died in hospital	Total
Mitral Stenosis	5	0	0	0	5
Mitral stenosis & pneumonia	1	0	0	0	1
Mitral Stenosis, IE, Hypertension	0	0	2	0	2
MS/MR	1	0	0	0	1
Diabetes Only	0	0	1	0	1
No known risk factor	0	0	3	0	3
Total	9	0	13	4	22

Diabetes mellitus was recorded in 10.2% (19 patients) of older age category while it was present in only 3 patients of stroke in the young group. Cigarette smoking, infection, pregnancy, oral contraceptive use and head injury were uncommon risk factors in both stroke groups as shown in Table 1. Out of 5 patients who were diagnosed to have infection, concomitantly with stroke, 2 had typhoid fever, two patients were

diagnosed to have pneumonia & 1 was with tuberculosis.

The proportions of patients without identifiable risk factors were similar (16.4% in the young versus 21% in the older age; $P<0.05$) in the stroke categories. The proportion of patients who died in the hospital among the older stroke category (16.7%) is statistically significantly higher than that of the stroke in the young category (6.8%).

Discussion

Stroke in the young constituted 28% of all the stroke admissions to TAH, similar to findings from India where 15-30% of the stroke patients were less than 45 years (6,9). Females out numbered males within stroke in the young category in the European series as well (10.11). However, contraceptive use and migraine were predominant risk factors among the European young women (8,10) contrary to our finding where RHD predominated as an important risk factor. Consistent with national prevalence rate (12), contraceptive use in this series was low.

The lower median age of females as compared to males in the young stroke category could be partly explained by dominance of RHD cases (who are younger) among them. Similar to other reports, (2-4,7) hypertension is the most frequent risk factor identified among both age categories. Hypertension is one of the known predisposing factors for atrial fibrillation (13).

Presence of hypertension, diabetes mellitus, prior myocardial infarction, left ventricular hypertrophy, and left atrial enlargement are known predictors of stroke in patients with chronic atrial fibrillation (9). Nine of the thirteen atrial fibrillation cases not related to valvular heart disease in this series were associated with hypertension. As previously reported from this hospital, RHD was the dominant factor associated with atrial fibrillation (14).

To identify those with subdural hematoma, which clinically mimics stroke, among patients with sudden neurologic deficit, history of head injury prior to the development of sudden neurologic deficit was retrieved. However, only two patients in stroke in the older age category had such a history, both of whom improved with out surgical intervention & with minimal residual neurologic deficits.

Similar to a previous report from Japan, mitral stenosis was the only rheumatic heart lesion associated with stroke in the absence of atrial fibrillation (15). Moreover, the rarity of mitral regurgitation among this series may support the previous suggestion that mitral regurgitation among RHD has a protective effect against stroke (16). As previously noted by some investigators (17-19) there did not appear to be relationship between severity of RHD and occurrence of stroke. Except for one, all the patients in this study had milder forms of the disease unlike earlier reports (19), where almost a quarter of RHD related stroke patients died in hospital none of our RHD cases died in hospital. The patients in the stated report, however, were much older with mean age of about 50 years. The absence of RHD among older patients may be due to an early death of the patients because of its aggressive course in developing countries (20). The favorable outcome in this series may be ascribed to younger age, rarity of co-morbid illnesses or milder severity of rheumatic heart diseases. Number of other factors could explain the overall lower rate of mortality in our patient group.

This rate is lower than the previously reported case-fatality ratios at one month of 23% (5). Our patients had shorter duration of follow up. Besides, low rates of smoking and diabetes were noted. Presence of hypertension, diabetes mellitus, smoking, and alcoholism are all known to be associated with increased stroke mortality (21).

Limitations of the study stem from its retrospective nature that the investigators couldn't be exhaustive pertaining to the risk factors and investigations of stroke as they are limited by the available data. However, important issues are identified which may have credible implication in the management of such patients.

Conclusion

As elsewhere hypertension remains the most important risk factor for stroke in both stroke categories. However, there are distinct differences in pattern of risk factors associated with stroke in the two categories. RHD is the second most frequent risk factor associated with stroke in the young while it is absent in the older age category. Interestingly severity of RHD is not related to frequency of stroke. The type of valve lesion was also limited to mitral valves; mitral stenosis being the most important lesion. If confirmed on subsequent prospective studies this finding will have an impact on indication for anticoagulation in cases of rheumatic heart disease.

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