



Stroke in young versus elderly clinical characteristic and in hospital mortality a retrospective cross-sectional study

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Background and purpose

About 10- 15% of all ischemic strokes occur in young adults ,limited researches have specifically addressed stroke in the young, also, the etiology of ischemic stroke in the young are heterogeneous and can be relatively uncommon the purpose is to identify different risk factors of stroke in young and elderly and predictors of in hospital mortality

patient and method: consecutive 197 patient with acute ischemic stroke admitted to neurology department, Sohag university hospital subdivided into two groups according to the age and the cut of point between young and elderly is 50-year, clinical characteristics, risk factors and hospital mortality was compared in both groups

Results: The prevalence of Rheumatic heart disease is common in ischemic stroke in young adult than elderly while hypertension is the most prevalence vascular risk factor, Charlson comorbidity index is independent predictor of hospital mortality of ischemic stroke in elderly

Conclusion: Rheumatic heart disease still prevalent in young adult in a sample of Egyptian population, hypertension is the most important modifiable risk factor Charlson comorbidity index and Scandinavian stroke scale on admission are predictors of hospital mortality in elderly and young adult respectively

Keywords: Rheumatic heart disease, stroke in young, hospital mortality

List of abbreviation

PFO; patent foramen oval, IHD; ischemic heart disease, RHD; rheumatic heart disease, mRS; modified Ranking Scale, SSS; Scandinavian stroke scale, CMI; Charlson Comorbidity Index.

Introduction:

Stroke is the disease of old age and about 10% of stroke patients are young, the incidence of ischemic stroke in young is increasing¹, the causes of this increase is uncertain, stroke in young has a significantly higher risk of early death in comparing to early death in general populations

Traditional stroke risk factors are known, many studies for stroke in a young, large study found that prevalence of hypertension is 39%, hyperlipidemia 60%, and smoking 44%³, Another study

revealed a high prevalence of conventional stroke risk factors⁴

Assessment of the patient with ischemic stroke at young age firstly need assessment like a stroke in the elderly furthermore need evaluation for other risk factors as cervical artery dissection, hypercoagulable state, patent foramen oval, vasculitis and hereditary blood disorders, dissection of arterial blood vessels is common it represents about 2% of ischemic stroke .dissection on cervical arteries is either primary or

secondary to trauma, and may be associated with connective tissue diseases like Marfan syndrome and Ehler Danlos syndrome type 4 and others^{5,6}

The incidence of arterial dissection per year is 1.72 per 100,000 for carotid vessels while 0.97 per 100,000 for vertebral vessels⁷, the fifth decade is the highest incidence and about 10% of cases are intracranial, multiple vessels in about 16% of cases⁸ Recent analysis conclude that clinical characteristics, risk factors and also functional outcome are different in comparing internal carotid with vertebral dissection^{9,10}, Dissection of the cervical artery may be due to intima tear followed by intramural hematoma or primarily intramural hematoma without intima tear¹¹ Superficial temporal artery wall abnormalities suggests that arteriopathy affection of adventitia and intima is important in the pathogenesis of the dissection¹². Arterial dissection is multifactorial, dissection is associated with either major or minor trauma. or coughing or sneezing among other people¹³ this study aims to clarify the difference between stroke in young and elderly and predictors of in-hospital mortality.

patient and methods

a consecutive 197 patients admitted to the Department of Neurology, Sohag University Hospitals, were screened with an acute ischemic stroke (AIS) diagnosis between May 2012 and May 2014. Figure 1 the eligibility criteria for involvement in the study is an acute ischemic stroke diagnosis admitted within the first 24 hours following the onset of the symptoms. Ischemic disorders includ-

ing shock, renal failure, documented inflammatory or malignant disease were omitted if patients had a clinical record of the previous documentation. Young adult is less than 50 years according to international classification²⁴

Ethical consideration

The ethical committee of the Sohag Faculty of Medicine approved our study. all patients signed written consent. acute ischemic stroke was defined according to World Health Organization definition²⁶, patient charts were abstracted for different variables, including age, sex, and vascular risk factors, and active smoking, the residence was defined as urban or rural. Charlson Comorbidity Index [CMI].²⁵ used for comorbidities in elderly group stroke severity (as measured by the Scandinavian Stroke Scale [SSS] on admission and modified Rankin Scale [mRS] at discharge.

statistical analysis

Analytical data have been analyzed for the Social Sciences Statistics Packages for the windows and by Graph Pad Prism 7.0 (Graph Pad Software Inc., La Jolla, California, USA). Continuous data as a mean \pm standard deviation, and categorical data as numbers and percentages were presented. The Student T-test for the continuous data Chi-square test for categorical data carried out analyses of disparities between young and old stroke patients. Instead of a Pearson Chi square test, we used Fisher Exact test when the data is non-parametric. Statistically important P values less than or equal to 0.05 were considered.

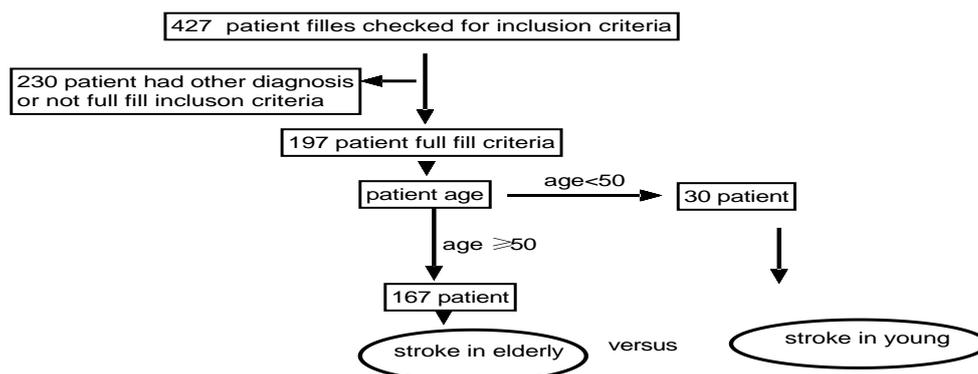


figure 1: show flow charts of the study population

Results

The mean age of a young adult is 38 ± 9.88 and for elderly 65 ± 9.3 , female is relatively common than male in both young and elderly and most of the cohort are from rural residence with no statistically significant difference. History of old stroke or Transient Ischemic Attack is non significantly higher in elderly than young. Regarding vascular risk factors, hypertension is statistically significantly higher in elderly than young (p-value = 0.03) Figure 2A

diabetes, millets and IHD are non-significantly higher in elderly (p-value = 0.78) and (0.92) respectively. RHD is statistically significantly higher in young adult (p-value = 0.003) Figure 2B, CMI is statistically significantly higher in elderly (p-value ≤ 0.001) and SSS is statistically higher among young (p-value = 0.047). MRS is near significant higher in elderly (p-value = 0.063) Table 1

Variable	Young (n=30)	Elderly (n=167)	P value
Age mean +SD	38 ± 9.88	65 ± 9.3	≤ 0.001
Sex, Male, n(%)	10(5.1)	70(35.5)	0.37
Female, n (%)	20(10.2)	97(49.2)	
residence, Urban, n (%)	13(6.7)	65(33.7)	0.72
Rural, n (%)	17(8.8)	98(50.8)	
Active smoking, n (%)	3(1.5)	21(10.7)	1
History of stroke (%)	5(2.5)	37(18.8)	0.49
History of TIA, n(%)	2(1)	13(6.6)	1
Hypertensive, n (%)	7(3.6)	74(37.6)	0.03
Diabetic, n (%)	4(2)	48(24.4)	0.78
IHD, n(%)	5(2.5)	29(14.7)	0.92
RHD, n(%)	3(1.5)	0(0)	0.003
CMI	2.4 ± 0.5	4.89 ± 1.2	≤ 0.001
SSS	39 ± 19	32 ± 18	0.047
mRS	2.9 ± 0.98	3.6 ± 1.76	0.063
Died	5(2.5)	32(16.2)	0.74

Table 1: Clinical characteristics and risk factors of both groups.

IHD; ischemic heart disease, RHD; rheumatic heart disease, mRS; modified Ranking Scale, SSS; Scandinavian stroke scale, CMI; Charlson Comorbidity Index

	Odd ratio	CI	P value
Univariate in young			
SSS	0.85	0.733-0.988	0.034
Univariate in elderly			
SSS	0.92	0.89-0.95	0.000
CMI	1.96	1.33-2.88	0.001
Multi variate logistic regression analysis of clinical predictors of mortality in elderly			
SSS	0.94	0.91-0.98	0.004
CMI	1.7	1.08-2.7	0.021

Table2: Univariate and Multivariate logistic regression analysis of clinical predictors of hospital mortality in young and elderly.

SSS; *Scandinavian stroke scale*, CMI; *Charlson Comorbidity Index*

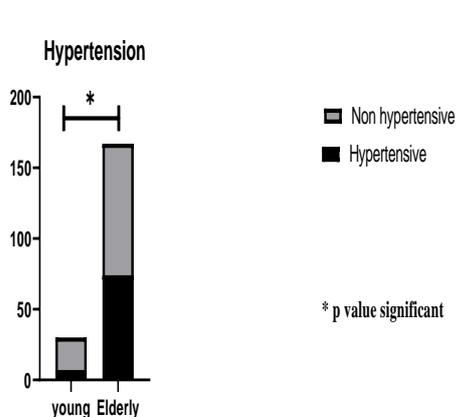


Figure 2A: show Hypertension in young and elderly

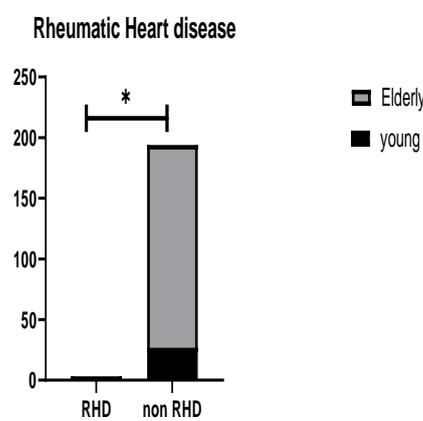


Figure 2B: show RHD in young and elderly

Discussion

Cardiac disease, hypertension, and diabetes mellitus are the most common risk factors among elderly people¹⁴. and that corresponds to our results

Another research identified hyperlipidemia then smoking, and finally hypertension¹⁵ as the most common vascular risk factors. Another review article explains the increased risk of cerebral infarction in young adults with traditional vascular risk factors is noted, especially in developing states because of increased smoking levels and urbanization, and this is not alien in our conclusion and this may be due to ethnic differences in stroke risk factors as well.²⁰ and the differences explained by the small number of adult patients of our cohort.

In another study by Putaala and colleague¹⁶, Current smoking (49%), and hypertension (36%) were the three most common risk factors¹⁶.and this also in line with our finding also common in young stroke patients in the People's Republic of China and New Zealand were classical vascular risk factors, including hypertension, dyslipidemia and cigarette smoking^{17,18}. And this not in line with our finding as we found Rheumatic heart diseases is statistically significant in young age groups and this can be due to prevalence of rheumatic heart disease in developing countries rather than other, Scandinavian stroke scale is a predictor of stroke mortality in both young and adult while Charlson comorbidity index is an independent

predictor of hospital mortality in elderly this is in line with previous studies^{19,20} a recent review article conclude that In the past, stroke in has been viewed as a disease with different risk factors and etiology and usually a better prognosis comparing to stroke in older patients. However, this view may be challenged. Traditional vascular risk factors in young adults with stroke have been somewhat neglected in the literature, which seems unjustified given their high prevalence^{21,22}

Limitation of the study the limitations of our study is the retrospective nature.

Conclusion valvular heart disses is still an important etiology of stroke in young age in a sample of the upper Egyptian population, other vascular risk factors are common in also in both young and elderly population, hypertension is the commonest vascular risk factor of stroke in the elderly, admission Scandinavian stroke scale is a predictor of hospital mortality of stroke patient, Charlson comorbidity index is a clinical independent predictor of hospital mortality in elderly stroke patients.

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Conflict of interest None

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