Original Article

Lifestyle assessment in two age groups of ischemic stroke: A cross-sectional study in Iran

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Abstract

Background: Healthy lifestyle factors are associated with a lower risk of stroke. The current study aimed to describe lifestyle-related risk factors in ischemic stroke.

Methods: In this cross-sectional study patients with ischemic stroke in two age groups assessed for lifestyle. Demographic characteristics (age, sex, BMI, marital status, educational level, job type as low or full stress, living area), lifestyle habits, and past medical history in two age groups collected in the structured form by researchers. Chi-square (Fisher's exact) test for assessment of the statistical difference between categorical variables applied. Also, a multivariate logistic regression model was used to predict possible life-threatening lifestyles which can lead to stroke under the age of 50 (odds ratio, 95% confidence interval). All statistical tests were two-tailed and were performed with the use of PASW Statistics for Windows, Version 18.0. Chicago: SPSS Inc. *P* values <0.05 were regarded as significant.

Results: Totally, 11.2% of ischemic stroke cases were 50≥ years old. In the multivariable logistic regression model higher BMI (*P*=0.02, OR =1.5, 95%CI=1.2 – 4.3), smoking (*P*<0.001, OR=1.8, 95%CI=1.08 – 2.56), alcohol drinking (*P*<0.001, OR=1.6, 95%CI=1.01 – 3.87), hookahs consumption (*P*<0.001, OR=1.2, 95%CI= 1.1 – 3.5) were predicting factors for ischemic stroke incidence in age ≤50 and only appropriate diet (low fat, sugar, salt, high fruits and vegetables) (*P*=0.01, OR= 0.7, 95% CI= 0.04-0.87) was preventive factors against stroke in age ≤50 years in compare with over 50.

Conclusion: Based on this survey many lifestyle factors effects the incidence of ischemic stroke in any age group. Therefore, periodic monitoring and effective in educating healthy people should be planned.

Keywords: Body Mass Index; Incidence; Risk Factors; Stroke

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Introduction

Despite significant progress in the prevention, treatment, and rehabilitation of stroke, it's incidence particular in young ages and low to middle-income countries is rising (1). Current epidemiological data indicate that 16.9 million people suffer a stroke each year, more than two million are young adults (below 55 years old) an increase up to 40% (2-3). It associated with negative economic effects such as increasing costs due to the decrease in the duration of productivity and usefulness (4). According to the report of Iranian stroke society, 160000 people in Iran suffer from strokes annually, 30% of them are under the age of 50 (5-8). Ghandehari et al. in 2006 reported the incidence of ischemic stroke in young adults was eight cases per 100,000 people per year in Iran (2). Many modifiable risk factors such as high blood pressure, cigarette and hookahs smoking, diabetes, high cholesterol, physical inactivity and obesity, and excessive alcohol intake are common in ischemic stroke but this association but is not clear in the different age groups (9-11). So far, few studies have been conducted on the lifestyle of patients with stroke in Iran. Therefore, the aim of this study was an investigation association between lifestyle and stroke in different age groups.

Methods

This descriptive cross-sectional study was conducted on patients with ischemic stroke were admitted in three subspecialty hospital, Tehran, Iran between 2018-2019. Non-probability (convenience) sampling method used and sample size calculated 502 patients. We excluded all hemorrhagic stroke cases through Computed Tomography (CT) scan and Magnetic Resonance Imaging (MRI) results. We prepared a data collecting form include demographic characteristics (age, sex, Body Mass Index (BMI), marital status, educational level, job type as low or full stress, living area) and lifestyle habits such as cigarette and hookah smoking, illicit drug use, alcohol drinking, type of diet including low/moderate and high fat, sugar and salt, fruit and vegetables, physical activity consist of no walking, walking<30 minutes/weekly, walking 30-90 minutes/ weekly, walking >90 minutes/weekly, night sleeping (hours) and daytime nap. We assessed past medical history for hypertension, diabetes, hypercholesterolemia, and hypertriglyceridemia, and hyperuricemia previously as well as in admission time (12-13). All information was obtained from the patient or his entourage (self-reported) so physical exam and lab tests. Informed consent was taken from all patients. This study was approved by the ethical committee of Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Patients with ischemic stroke divided two age groups (≤50 and 50< years). For the report, descriptive data results in mean±standard deviation (SD) and number (percent) used. Chi-square (Fisher exact) test for assessment statistical difference between categorical variables applied. Also, a multivariate logistic regression model to predict possible life-threatening styles can more lead to stroke under age 50 (odds ratio, 95% confidence interval) used. All statistical tests were two-tailed and performed with the use of PASW Statistics for Windows, Version 18.0. Chicago: SPSS Inc. *P* values <0.05 were regarded as significant.

Results

In this study among 502 ischemic stroke cases 56 (11.2%) were age ≤50 years. There was not statistical significant difference between sex and stroke in age groups. Table 1 shows association between demographic as well as lifestyle variables and ischemic stroke frequency in age groups in bivariate chi^2 analysis (Table 1).

Table 1. Association between ischemic stroke in two age groups and lifestyle

Variables	Age Number (Percent%) (n=56) 50≥	(n=446) 50<	Chi 2 P	Logistic regression OR(95%CI)	P
Sex			0.9		
Male	34(60.7)	270(60.5)		1.5(0.5-4.9)	0.4
Female(reference)	22(39.3)	176(39.5)			
BMI			0.09		
Overweight	43(76.8)	299(67)		1.1(1.03-2.04)	0.02*
Obese	6(10.7)	91(20.4)		1.5(1.2-4.3)	0.01
Normal(reference)	7(12.5)	56(12.6)			0.03
Living area			0.3		
Capitals and big cities	45(80.4)	376(84.8)		0.8(0.2-2.2)	0.4
Suburban and rural areas(reference)	11(19.6)	68(15.2)		0.6(0.3-2.3)	
Marital status			0.1		
Married	38(67.9)	307(68.8)		0.8(0.2-2.2)	0.1
Widow and divorced	13(23.2)	122(27.4)		0.7(0.1-3.2)	0.2
Single(reference)	5(8.9)	17(3.8)			0.2
Education			0.2		
Primary and high school	27(48.2)	244(54.7)		0.7(0.5-1.5)	0.2
Diploma	26(64.4)	154(34.5)		0.2(0.1-2.3)	0.1
Academic level	2(3.6)	40(9)		0.3(0.3-2.2)	0.2
Illiterate(reference)	1(1.8)	8(1.8)			0.1
Job type			<0.001*		
Full stress	35(62.5)	80(17.9)		1.4(1.02-7.56)	0.6
Low stress(reference)	21(37.5)	366(82.1)			
Smoking			<0.001*		
Yes	30(53.6)	97(21.7)		1.8(1.08-2.56)	<0.001*
No(reference)	26(46.4)	349(78.3)			
Alcohol drinking			<0.001*		
Yes	14(25)	20(4.5)		1.6(1.01-3.87)	<0.001*
No(reference)	42(75)	426(95.5)			
Hookah consumption			<0.001*		
Yes	26(46.4)	76(17)		1.2(1.1-3.5)	<0.001*
No(reference)	30(53.6)	370(83)			
Illicit drug use			0.6		
Yes	6(10.7)	33(7.4)		1.4(0.9-5.43)	0.6
No(reference)	50(89.3)	413(92.6)			
Diabetes			0.2		
Yes	23(41.1)	219(49.1)		0.3(0.1-6.5)	0.4
No(reference)	33(58.9)	227(50.9)			
Hypertension			0.03 *		
Yes	13(23.2)	168(37.7)		1.2(0.6-4.34)	0.3
No(reference)	43(76.8)	278(62.3)			
Hypercholesterolemia			0.2		
Yes	10(17.9)	110(24.7)		0.4(0.1-3.4)	0.4
No	46(82.1)	336(75.3)			
Hypertrigliceridemia			0.6		
Yes	8(14.3)	53(11.9)		2.4(0.2-5.4)	0.4
No	48(85.7)	393(88.1)			
Hyperuricemia			0.4		
Yes	11(19.6)	69(15.5)		1.8(0.2-6.32)	0.4
No	45(80.4)	377(84.5)			

*Statistical significant
OR: odds ratio
CI: Confidence interval

Table 1. Continuous …

Diet			0.004*		
Low fat, sugar, salt/High fruits and vegetables	9(16.1)	107(24)		0.7(0.04-0.87)	0.01*
Moderate fat, sugar, salt, Moderate fruits, and vegetables	14(25)	179(40.1)		0.5(0.18--0.82)	0.02
High fat, sugar, salt, Low fruits, and vegetables(reference)	33(58.9)	160(35.9)			0.02
Physical exam			0.3		
Walking<30 minutes/weekly	8(14.3)	72(16.1)		0.7(0.1-1.4)	0.3
Walking 30-90 minutes/ weekly	2(3.6)	18(4)		0.2(0.1-2.31)	
Walking >90 minutes/weekly	8(14.3)	33(7.4)		0.3(0.3-1.1)	
No(reference)	38(67.9)	323(72.4)			
Night Sleeping			0.01*		
7hours	17(30.4)	83(18.6)		0.6(0.2-0.97)	0.01*
8hours	8(14.3)	67(15)		0.8 (0.1-0.97)	0.07
9hours≤	1(1.8)	24(54)		0.75(0.2-0.91)	0.08
≤6hours(reference)	30(53.6)	272(61)			
Daytime nap			0.5		
Once or several times/day	33(58.9)	279(62.4)		0.8(0.2-3.45)	0.5
No or only occasionally(reference)	23(41.1)	167(37.4)			

*Statistical significant
OR: odds ratio
CI: Confidence interval

In full model of multiple logistic regression, BMI (overweight and obese) (*P*=0.01, OR= 1.1, 95%CI= 1.03 – 2.0.4) and (*P*=0.03, OR= 1.5, 95%CI= 1.2 – 4.3) also, cigarette smoking (*P*<0.001, OR= 1.8, 95%CI= 1.08 – 2.56), alcohol drinking (*P*<0.001, OR= 1.6, 95%CI= 1.01 – 3.87), hookah consumption (*P*<0.001, OR= 1.2, 95%CI= 1.1 – 3.5) were associated factors with higher stroke frequency in age ≤50. On the other hand, appropriate diet (low fat, sugar, salt and High fruits and vegetables) (*P*=0.02, OR= 0.7, 95%CI= 0.04-0.87) (moderate fat, sugar, salt and moderate fruits and vegetables) (*P*=0.02, OR= 0.5, 95%CI= 0.18-0.82) and sufficient night sleep (7 hours) (*P*=0.01, OR= 0.6, 95%CI= 0.2-0.97), (8 hours) (*P*=0.01, OR= 0.8, 95%CI= 0.1-0.97), (9≤ hours) (P=0.03, OR= 0.75, 95%CI= 0.2-0.91) were preventive factors against ischemic stroke in age ≤50 (Table1).

Discussion

In this study, 11% of ischemic stroke accrued in young adults (age ≤50) which was in the range of other studies (5-21%) (14-15). According to the World Health Organization (WHO), about 16 million people suffer strokes worldwide each year, which 10-12% are under 50 years (12). In the current survey, 60.7% of patients with stroke in young adults were male like the result of other studies (16-17) but there was no statistical difference between sex and ischemic stroke in 2 age groups. We found 62.5% cases with stroke age ≤50 were exposed to full stress jobs while this percentage was significantly lower in cases of stroke more than 50 years (17.9%). In Tsutsumi et al., study multivariable logistic regression analysis showed a more increase in the risk of total stroke among men with job stress (hazard ratio: 2.73; 95%CI: 1.17-6.38) compared with counterpart men with a low-stress job after adjustment for age, educational attainment, occupation, smoking status, alcohol consumption, physical activity, and study area. In women, no statistically significant differences were found for any stroke incidence among the job characteristic categories (18). One research in the US revealed that the association between stroke and life stress is not clear. However, chronic stress throughout life can be accompanied by a stroke (19). Camelo et al. indicated high-strain jobs were not associated with carotid intima-media thickness (20).

We reported a statistical difference between ischemic stroke in 2 age groups and smoking so alcohol drinking and hookah consumption. Wu et al. reported smoking and alcohol consumption were strongly related to men gender, and heart disease and obesity were related to women's ischemic stroke (21). Spengos et al. mentioned smoking (59.3%) and dyslipidemia (41.1%) were the most frequent risk factors for early stroke (22). Although there was no significant association between illicit drug use (cocaine) and stroke, many studies showed this relationship (15). Mateen et al. declared the risk of mortality was significantly increased with hypertension (P<0.001, OR= 7.94, 95% CI= 4.44–15.54), diabetes mellitus (P=0.02, OR= 2.54, 95% CI= 1.21–6.21) (29). Results of von Sarnowski et al. confirmed both withdrawal and excessive alcohol intake cause the rise of blood pressure, platelet activation, and hypercoagulability, which ultimately may promote ischemic stroke (23).

There are about 400 toxic agents in tobacco hookahs which increase blood pressure and risk of stroke (25-26). In current research difference between the prevalence of hypertension was significant in 2 age groups of stroke (23.2% in age≤50 Vs 37.7% in age>50). We did not find a statistical difference between stroke in 2 age groups and hypercholesterolemia, hypertriglyceridemia, and hyperuricemia. Overall hypertension is the leading cause of heart failure and accounts for half of the deaths from stroke globally and an effort to decrease hypertension can lead to the prevention of cardiovascular, stroke, and end-stage renal disease risks (27). Elevated levels of blood lipids (cholesterol, elevated TG, or both) are well-documented risk factors for cardiovascular disease. (33). In the Mehrpour et al. study, a significant negative correlation between the age of patients and their serum uric acid level (P=0.04, r= -0.27) was seen which was the same as our results (7). Mohsin et al. study showed about 27.38% of patients in an ischemic stroke had elevated serum uric acid whereas all hemorrhagic stroke cases had a normal uric acid level but there was no difference between age groups (28). In our survey, the difference between stroke in age groups and diet habits was found. High-calorie regime (fat, sugar, salt), low fruits/vegetables diet was more significant in the early age of ischemic stroke. Mitchell et al. study showed an association between increased BMI and early onset stroke, which is consistent with studies conducted in older adults (29). Shou et al. study indicated diabetes is more than the 2-time risk for a wide range of vascular diseases which is similar to other studies (30-31). High daily dietary intake of fat is associated with obesity and may act as an independent risk factor or may affect other stroke risk factors such as hypertension, diabetes, hyperlipidemia (32-33).

We found night sleeping 7 hours and more were protective factors for ischemic stroke at age ≤50. Other studies indicated both short and long nocturnal sleep duration is independently associated with cardiovascular diseases including stroke. This association may be especially prominent at younger ages (34-35). We limited our study to ischemic stroke and some important modifiable lifestyle parameters while there are many other influencing risk factors. This study was one hospital-based study and associated selective bias, whereas epidemiological studies should be carried out based on population.

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Conflict of interest

Authors declare no conflict of interests.

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