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ORIGINAL ARTICLE

Association of Stroke Disability with Physical Activity and Activities of Daily Life

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Keywords

Stroke, Disability, Association, Physical Activity

Author's Contribution

[1]Data analysis, Synthesis, Manuscript writing

[2,3]Conception, Planning of research

[4,5]Discussion

Article Info.

Received Date: Sept 5th, 2018

Accepted Date: June 16th, 2019

Conflict of Interest: Nil

Funding Sources: Nil

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Cite this article as: Saleem S, Hanif S, Khan R, Altaf S. Association of Stroke Disability with Physical Activity and Activities of Daily Life. JRCRS. 2019; 7(1):17-20.

doi: 10.5455/JRCRS.2019070105

ABSTRACT

Background: Impairments mostly associated with stroke patients include functional reduction and motor impairments which is referred to as physical disability. However, there is limited evidence available from different countries about the exact incidence and prevalence of stroke. Also the severity with which stroke affects different functions of the body and etiology of death after stroke is not fully known.

Objectives: The main objective of the study was to determine frequency of stroke related disability and its association with various factors.

Material and methods: A cross sectional study was conducted from March to July, 2015 which recruited 168 diagnosed patients of stroke of either gender using non probability convenient sampling. Data was collected from 10 different hospitals of Rawalpindi and Islamabad using Modified Rankin Scale for disability, Rapid Assessment of Physical Activity (RAPA) to assess physical activity level, Barthel scale for activities of daily life and Fagerstrom Test for Nicotine Dependence (FTND) for smoking habits. After collection, data was analyzed using SPSS version 20.

Results: Out of a total of 168 stroke participants, 113 (66.5%) were males and 55 (32.4%) were females. 1.8% suffered from slight disability, 9.4% from moderate disability, 25.3% from moderately severe disability and 51.2% from severe disability. According to the results, a significant association of disability was found with physical activity and activities of daily life ($P<0.05$) whereas no association of disability was found with age and nicotine dependence with p-value = 0.08 and 0.46, respectively.

Conclusion: It is concluded that there is an association between disability and physical activity. Majority suffered severe disability and physical dependence in activities of daily living. Diabetes Mellitus, Hypertension and cardiac problems were more prevalent in most cases.

Introduction

Stroke is reported to be one of the major causes of morbidity and mortality and the third leading cause of death around the world.[1] Impairments mostly associated with stroke patients include functional reduction and motor impairments which is referred to as physical disability.[2] However, there is limited evidence available from different countries about the exact incidence and prevalence of stroke. Also the severity with which stroke affects different functions of the body and etiology of death after stroke is not fully known.[3] According to the studies among all types of stroke, 80% are ischemic while the remaining being hemorrhagic (including 15% intracerebral hemorrhage, 5% subarachnoid hemorrhage).[4] Stroke without an evident explanation or "cryptogenic" (of unknown cause) stroke constitutes about 30-40% of all the ischemic strokes.[5] However, in Asia regarding etiology, intracranial atherosclerotic stenosis and occluded small vasculature are two mostly used classifications of stroke.[6] Functional impairments that develop after stroke require serious attention as around 20% of people after stroke take

medical care for around 3 months in hospitals or other centres for rehabilitation and still around 15 to 30 percent remain functionally impaired for whole of life putting burden on the economy.[7]

Various risk factors have been identified regarding stroke, among which some of them are modifiable and others are non-modifiable. Modifiable risk factors include: hypertension, atrial fibrillation, smoking, cardiovascular diseases, sedentary life style, dyslipidemias, obesity, increase blood cholesterol, alcohol intake, poor dietary habits and to some extent diabetes. However age, gender, race, prior stroke are the factors that cannot be modified in any way.[8] Now some studies have also shown migraine as a risk factor of stroke.[9]

Risk factors should be properly identified, only then they can be prevented. By providing awareness about all the risk factors, stroke can be prevented in an effective way. The current study is conducted to find out the frequency of various risk factors among the patients of the stroke in order to noticeably decrease the incidence, recurrence, disability, and mortality of stroke. This will significantly decrease the burden of the disease from the society.

Methodology

A cross sectional study was carried out on community stroke survivals in Rawalpindi and Islamabad from March to July, 2015. 168 patients were included in the study by using non probability convenient sampling. Sample size was calculated through EpiTool using 95% confidence interval. Stroke patients of more than 18 years of age and either gender were included in the study after informed consent, while all other patients affected with related co-morbidities and critically ill patients that were unable to respond were excluded from the study. Data was collected by demographic details, Modified Rankin scale and Rapid Assessment of Physical Activity (RAPA) scale and Barthel Index while smoking habits of a patient were checked by Fagerstrom Test for Nicotine Dependence (FTND) scale. All the outcome measure tools were valid and reliable. (10, 11, 12) Data was analyzed by SPSS 20. The chi square test was applied to determine the association of stroke related disability with various factors.

Results

Results of the study showed that of all the affected patients, 113 (66.5%) were male and 55 (32.4%) were female. While 3.5% suffered from no symptoms, 7.6% despite having symptoms suffered from no significant disability. 1.8% suffered from slight disability, 9.4% from moderate disability, 25.3% from moderately severe disability and 51.2% from severe disability. 55.9% of patients suffered from ischemic stroke while the remaining 31.2% were diagnosed with hemorrhagic stroke. Mean age for onset of stroke was found to be 58.60 ± 15.28; According to the results, Middle Cerebral Artery (MCA) had the highest percentage (33.5%) whereas Transient Ischemic Attack had the least (1.2%). 33 (19.4%) patients suffered from Anterior Cerebral Artery (ACA) whereas only 3 patients (1.8%) were affected with both ACA and MCA. Among all hemiplegics around 36.5% have diabetes, 24.7% are those suffering from any cardiac problem and 78.2% have hypertension.

According to the results, a significant association of disability was found with physical activity and activities of daily life (p-value < 0.05). On the other hand, no significant association of disability was found with age and nicotine dependence (p-value > 0.05) (Table I)

Table I: Association of stroke related disability with age, physical activity, activities of daily life and nicotine dependence

Factors	Mean	Standard Deviation	P Value
Age	58.60	15.28	0.08
Disability	4.01	1.20	
Disability	4.01	1.30	<0.001
Physical activity	3.18	1.03	
Disability	4.01	1.40	<0.001
ADLs	30.82	31.96	
Disability	4.01	1.38	0.46
Nicotine dependence	1.33	2.84	

Discussion

A total of 168 patients was included in this study and were evaluated for disability. 1.8% suffered from slight disability, 9.4% from moderate disability, 25.3% from moderately severe disability and 51.2% from severe disability.

The study conducted by Sooyeon Kwon and colleges showed that cardiac problems was a major

e-ISSN: 2410-888X p-ISSN: 2226-9215

comorbidity which affected 31% of the particpant.[13] Results of our study revealed somewhat similar results with hypertension prevailing in 78.2% of the patients and cardiac problems among 24.7%. There is a significant decline in the trend of age of people suffering from stroke with 71.2 years of those reported in 1993 - 1994 to 69.2 years reported in 2005.There is also a noticeable increase in stroke in persons with age less than 55 in 2005 when compared to previous reports.[14] This is contrary to our study which shows no significant association with age. Other than age, the second most associated factor is physical activity. A study conducted by Chong Do Lee et al in 2003 reported that individuals who are highly active had 64% lower risk of stroke compared with those who are less active. Similarly, in this study also, a significant association of disability was found with physical activity.[15] Martins T. et all conducted a study in 2006 to evaluate post-stroke functional health status and quality of life and concluded that the most affected factors were physical functioning and the capacity to perform daily activities. This supports the result of our study which showed strong association between disability and activities of daily life.[16] RAPA scale revealed that majority of the patients did absolutely no exercise to increase physical fitness prior to the attack. A previously conducted study revealed that active individuals had a 20% lower risk and highly active individuals had a 27% lower risk of stroke incidence or mortality than the low-active individuals.[17] Our results are consistent with many previous studies which suggest that regular physical activity is related with decrease of cerebrovascular and cardiovascular events which may relate to enhance endothelium-dependent vasodilation. Physical activity not only decreases stroke risk, but also provides a prophylactic treatment strategy for increasing blood flow and reducing brain injury during cerebral ischemia.[18] Our study revealed slightly uneven gender distribution as there were slightly more males than women. Other studies showed similar results with higher prevalence of stroke in women than in men.[19] Diabetics are more likely to develop stroke and they suffer increased morbidity and mortality after stroke. It is a well-established independent risk factor for stroke and is associated with high mortality.[20] A major percentage of the patients in our study were also positive for diabetes mellitus. Numerous studies have proved that cigarette smoking continued to make a significant independent contribution to the risk of stroke generally and brain infarction specifically. A cohort study done in Japan showed high prevalence of both heart disease and stroke in smokers.[21] Similarly a study done on Chinese population showed positive relationship between stroke and smoking.[22] Another study reported positive relationship between smoking and stroke and stated that smokers are more liable to the development of stroke than nonsmokers and the risk increases about two to four times.[23] This study found no association of disability with nicotine intake. However, a study conducted in 2003 by Kjell Asplund et all concluded that regular male smokers have twice a chance of developing stroke.[24]

The study participants were not in equal proportion gender-wise because of which the association of gender could not be evaluated. Future studies with larger sample size and longitudinal designs should be conducted to ensure more generalizability.

Conclusion

Majority of patients suffered from severe disability. Ischemic type of stroke was found to be more common than hemorrhagic stroke. There was significant association of stroke related disability with physical activity and activities of daily life while no association of disability was found with age and nicotine dependence.

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e-ISSN: 2410-888X p-ISSN: 2226-9215