

Original Article

The Relationship between Demographic Factors in Adult Patients with Stroke

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ABSTRACT

Background: Developing countries are challenging with stroke as the third cause of death in developed countries and the most popular neurologic disease which results in disability. This study was designed to assess the relationship between demographic factors and early outcome in adult patients with difference type of stroke. **Methods and Materials:** A retrospective register review was performed from March 2017 to March 2018. ED medical document (chart) were reviewed by a neurologist or physician to obtain the clinical diagnosis, patient characteristics. Their demographic data (such as age, gender), NIHSS score and MRS score were filled in questionnaire. the significant variables were verified in a multivariable model to achieve an attuned estimate of effect. **Results:** A total of 861 patients with stroke were included in the analysis; the male and female sex in the statistical population were 56% and 43%; the mean age of the patients was 14.32 ± 61.74 . The mean NIHSS (16.08 ± 10.51) & MRS (3.66) scores were evaluated, respectively 47% severe stroke (NIHSS>16). There was no significant relationship between age increase and NIHSS increase ($P = 0.86$). **Conclusion:** Aging has a significant relationship with increased stroke. Gender and age differences in risk of stroke outcomes are mostly described by variations in physical characteristics and stroke severity of the patients.

BACKGROUND

Stroke is an unavoidable condition of increasing social and economic prominence in healthy populations. In relation to the World Health Organization, stroke is ranked as the second cause of death globally in 1990 and it is the third leading reason of death in developed countries (1); it accounts for 4.4 million deaths worldwide (2). Stroke is not only a death cause, it also the main cause for long-term disabilities and heavy burden in terms of emotional, social, and economic costs for patients, their families and healthcare services. The cost of longevity of each patient is estimated between \$59,800 and \$230,000. Stroke and coronary artery disease are predicted to be the main cause of healthy years of life in 2020 (3). The effects of improved onset and survival changes on the reduction in mortality due to strokes have not been adequately measured, which is mainly due to problems with truthful dimension of the stroke prevalence. Data from the stroke project of WHO (MONICA) examined the general trend of fatality and stroke in people with age range of 35-64. The age of stroke is older in males than in females. Nevertheless, a lengthier life expectation for females and a sharp rise in stroke at aging will increase the number of women with stroke (2-5). Although studies generally sug-

gest evidence of worsening outcomes in women, the recent study suggests several studies of which men are based poor results and many studies with parallel results for males and females (5). Meanwhile there are sex and age variances in the physical characteristics of patients. We examined the gender and age variances in patients' characteristics in admittance and organization, and results in subtype of stroke.

METHOD AND MATERIAL

A retrospective medical records assessment was completed on all patients with a final diagnosis of stroke during a period from March 2017 to March 2018. Patient who referred to the emergency department (ED) of Imam Reza hospital then admitted to neurology department. This hospital is a certified stroke center, and comprehends more than 1000 stroke codes in the ED each year. Patients were included in this study who aged more than 14 years and admitted to the neurology department. Patients exposed to transient clinical ischemic attacks without imaging correlation were excluded from the study. The findings of the imaging have been confirmed by the radiologist. All patients were examined by a neurologist. Demographic data and medications were recorded at the be-

ginning of the activity. Initial signs and symptoms of stroke were extracted from consultation notes.

Definition of Study Variables

For classifying stroke severity into five levels, the NIH Stroke Scale (NIHSS) (6) was applied. The management process of stroke patients including the use of diagnostic methods and thrombolytic treatment were assessed by the acceptance department. Also we studied the outcomes at expulsion: disability or death (mRS) ≥ 2 (7). Informed consent was not necessary, whole data were extracted from stroke registry database of neuroscience research center of Tabriz University of medical sciences. The study protocol was approved by the ethic committee of Tabriz University of medical sciences review board. The stroke data base of neurology department was reviewed by two reviewers, and 861 charts (patients) to establish a diagnosis of stroke.

Statistical Methods

Variances by sex in baseline characteristics were studied using the chi-square test for confident variables and the student t-test for age. Statistical analyses were done using IBM SPSS Statistics (version 22) software package. All tests were 2-sided, and the <0.05 amount was considered as P-value significance.

RESULTS

All acute stroke patients in one year of Imam Reza hospital were included ($n = 861$, 56% men and 34% women). Females were on average 5.5 years younger than men. Disability and stroke severe were significantly higher in men than women ($p=0.01$). There were no sex differences in amounts of stroke unit's admission; though, the amount of females' admission in any neurology department was lower in front of males, and this finding was reliable also after adjusting for age, stroke severity, comorbidity. Use of head CT rates usage was same for all patients and, no significant difference was shown after age controlling. Amounts of intravenous t-PA use were parallel in males and females also both genders were similar in rates of any reperfusion therapy for ischemic stroke.

Disability or poor outcome was more significantly observed in women (64.8%) than men (51.7%) ($p < 0.01$ for both). We found low Barthel Index in males and a higher amount of males, scored ≤ 60 points, and showed significant disability. We found male high proportion among all age groups, most obviously in patients aged 60 to 80 years. Our finding showed 7.2% of patients aged under 40 years, 21.2% aged 40-60, 49.9% aged and 19% aged more than 80. The aging as a risk was increased for ischemic strokes while not for hemorrhagic strokes. Stratifying by aging the risk for all stroke was increased in both sexes. The risk of hemorrhagic stroke in females is higher than males. Table 1

DISCUSSION

In this retrospective study, we found that the prevalence of specific age patterns among various types of stroke.

Table 1. Gender and stroke subtype

	Male (n)	Female (n)	P-value
Ischemic stroke	314	221	0.04
IVH and ICH	138	89	0.12
SAH	33	43	0.11

ICH: Intracerebral hemorrhage, IVH: Intraventricular hemorrhage, SAH: Subarachnoid hemorrhage

In all of the following cases we found stroke to overcome the vanity of a man who was aged. Females with stroke were younger and existing with unlike characteristics of risk factors than males in a nationally sampled hospital admitted to acute stroke. We also found that women are less likely to admit the neurology ward, although in gender admission rates there was no significant difference.

Nonetheless, the increase of wicked results in females was mostly clarified by the difference in age and severity of stroke. Our findings support differences in the features in accepting preceding studies. previous studies reported women with stroke were more than four years older than men with stroke (6-8). A higher level of pre-stroke disability, dissimilar risk factors, and more frequency of co-morbidity were estimated to determine the characteristics of patients, the relationship between sex and the outcome of stroke by comparing the prevalence of gender among a exemplary, containing gender, and an accustomed exemplary. We compared gender containing age (9-13). The obtained results from these comparisons showed effects, especially for the age with post-stroke prognosis. As regards critical treatment for ischemic stroke, both males and females reported (14) the equivalent probability in receiving thrombolysis, but there is a high quality review which reported that females are less probable than males to be preserved with intravenous t-PA (15). Based on our finding, we did not find gender differences in the receiving rate of thrombolysis. Previous reports of gender differences from stroke outcomes commonly support high fatality and inability rates in females, but the impact of gender is unclear. In relation to a latest review (5), the age-adjusted findings on gender differences in functional outcome and handicap after stroke showed that most of them were affected by stroke severity. Though, the pre-stroke functional status, as an important synchronizer was less common in relationships between gender and the outcome of stroke. Although some studies indicated that females in compare of males have poorer stroke performance (9,10). Complete information on the risk factors for associated illnesses, stroke severity, functional status, stroke supervision, as well as the characteristics of subjects in multivariate have been used in this study, which is permitting for a superior assessment of the sex and age role in stroke. As the conclusion, the previous findings strongly advocated that gender is not related to stroke outcome. While a recent study reported that females had lower survival than males, but this finding was related to age differences and decreased level of awareness in time of admission (16).

CONCLUSION

Our findings regarding sex and fatality or poor practical outcome, didn't show any independent relationship. Aging has a significant relationship with increased stroke.

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REFERENCES

1. Reeves MJ, Bushnell CD, Howard G, et al. Sex differences in stroke: epidemiology, clinical presentation, medical care, and outcomes. *Lancet Neurol* 2008;7:915–26.
2. Wang W, Jiang B, Sun H, Ru X, Sun D, Wang L, Wang L, Jiang Y, Li Y, Wang Y, Chen Z. Prevalence, Incidence, and Mortality of Stroke in China: Clinical Perspective: Results from a Nationwide Population-Based Survey of 480 687 Adults. *Circulation*. 2017 Feb 21;135(8):759-71.
3. Phan HT, Blizzard CL, Reeves MJ, Thrift AG, Cadilhac D, Sturm J, Heeley E, Otahal P, Konstantinos V, Anderson C, Parmar P. Sex differences in long-term mortality after stroke in the INSTRUCT (INternational STroke oUtcomes sTudy): a meta-analysis of individual participant data. *Circulation: Cardiovascular Quality and Outcomes*. 2017 Feb 1;10(2):e003436.
4. Li L, Geraghty OC, Mehta Z, Rothwell PM, Study OV. Age-specific risks, severity, time course, and outcome of bleeding on long-term antiplatelet treatment after vascular events: a population-based cohort study. *The Lancet*. 2017 Jul 29;390(10093):490-9.
5. Gall SL, Tran PL, Martin K, Blizzard L, Srikanth V. Sex differences in long-term outcomes after stroke: functional outcomes, handicap, and quality of life. *Stroke* 2012;43:1982–7
6. Brott T, Adams Jr HP, Olinger CP, et al. Measurements of acute cerebral infarction: a clinical examination scale. *Stroke* 1989;20:864–70.
7. Herdon R. Handbook of neurologic rating scales. New York: Demos Vermande; 1997.
8. Appelros P, Stegmayr B, Terent A. Sex differences in stroke epidemiology: a systematic review. *Stroke* 2009;40:1082–90.
9. Di Carlo A, Lamassa M, Baldereschi M, et al. Sex differences in the clinical presentation, resource use, and 3-month outcome of acute stroke in Europe: data from a multicenter multinational hospital-based registry. *Stroke* 2003;34:1114–9.
10. Lai SM, Duncan PW, Dew P, Keighley J. Sex differences in stroke recovery. *Prev Chronic Dis* 2005;2:A13.
11. Li OL, Silver FL, Lichtman J, Fang J, Stampelcoski M, Wengle RS, Kapral MK. Sex differences in the presentation, care, and outcomes of transient ischemic attack: Results from the Ontario stroke registry. *Stroke*. 2016 Jan;47(1):255-7.
12. Asdaghi N, Romano JG, Wang K, Ciliberti-Vargas MA, Koch S, Gardener H, Dong C, Rose DZ, Waddy SP, Robichaux M, Garcia EJ. Sex Disparities in Ischemic Stroke Care: FL-PR CRESD Study (Florida–Puerto Rico Collaboration to Reduce Stroke Disparities). *Stroke*. 2016 Oct 1;47(10):2618-26.
13. Bray BD, Paley L, Hoffman A, James M, Gompertz P, Wolfe CD, Hemingway H, Rudd AG, SSNAP Collaboration. Socioeconomic disparities in first stroke incidence, quality of care, and survival: a nationwide registry-based cohort study of 44 million adults in England. *The Lancet Public Health*. 2018 Apr 1;3(4):e185-93.
14. Madsen TE, Khoury J, Alwell K, Moomaw CJ, Rademacher E, Flaherty ML, Woo D, Mackey J, La Rosa FD, Martini S, Ferioli S. Sex-specific stroke incidence over time in the Greater Cincinnati/Northern Kentucky Stroke Study. *Neurology*. 2017 Sep 5;89(10):990-6.
15. McDermott M, Lisabeth LD, Baek J, Adelman EE, Garcia NM, Case E, Campbell MS, Morgenstern LB, Zahuranec DB. Sex disparity in stroke quality of care in a community-based study. *Journal of Stroke and Cerebrovascular Diseases*. 2017 Aug 1;26(8):1781-6.
16. Veerbeek JM, Kwakkel G, van Wegen EE, Ket JC, Heymans MW. Early prediction of outcome of activities of daily living after stroke: a systematic review. *Stroke* 2011;42:1482–8.