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Original Research Article

Frequency and causes of mortality in patients with stroke referred to Zahedan hospitals in 2016

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ABSTRACT

Background: Stroke is the third common cause of mortality worldwide. This study was conducted with the aim of Evaluation of mortality rate and its causes in patients with stroke referred to Zahedan hospitals.
Methods: This was a cross-sectional study that conducted on 320 patients with stroke. Data collected by a checklist and then analyzed by statistical methods in SPSS.19.
Results: Of all patients, 59.7% were male and 40.3% were female. The mean age of patients was 63.18±13.85 years. 76% of the strokes were ischemic and 24% were hemorrhagic. The mortality rate in this study was 16.3% which was not correlated with age, gender and type of stroke. The most common cause of mortality was Aspiration Pneumonia with 36.5 % and then sepsis with 32.7%.
Conclusions: In overall, this study showed that mortality rate was 16.3 % and the most common cause of mortality was pneumonia aspiration and sepsis.

Keywords: Causes, Mortality, Stroke

INTRODUCTION

Stroke refers to brain dysfunction as a result of the sudden cessation of blood flow and abnormal blood supply to the part of the brain, which is considered as the first cerebrovascular disorder in the United States and the third cause of death after cardiovascular disease and cancer in the world.[1,2]

According to the study conducted in Mashhad in 2010, the prevalence of stroke was significantly higher than most of western countries and it happened at an earlier age. The annual prevalence of incomplete and first-time stroke in Iran was 139 per 100,000 people.[3] Another study results in north of Iran during 2001-2003 showed an average age of stroke patients was 68.2 years and most of them were male and of them more than 90% lived in urban areas.[4] Although stroke is considered an elderly disease but one third of strokes occur in people under 65 years of age. The risk of stroke is increased with age, so that 75% of strokes occurs in people over 64 years of age.[5] In general, stroke is divided into two types of ischemic and hemorrhagic stroke, which account for approximately 85% and 15% of the total stroke, respectively. Ischemic stroke includes stroke of the large arteries (20%), small thrombotic strokes (25%), cardiogenic (20%), strokes of unknown origin (30%) and other strokes (5%).

Several factors such as age, gender, high alcohol use, smoking, and high blood pressure have major role in the incidence of stroke. High blood pressure is a major risk

factor for the incidence of stroke. Stroke deal to long term disability in the community and is a syndrome which determined by the start of acute neurological symptoms that persist for at least 24 hours and confirmed by CT-scan and MRI.[6] Usually there are no warning signs or very slight signs before stroke. The severity of post stroke complications depends on the type and location of the stroke and the extent of the affected tissues and can be mild and transient, such as blurred vision, permanent crippling complications or even death.[7]

A study on the mortality rate of patients with stroke is of great importance because of high mortality rates and by improving management practices, we can increase the survival chance of patients and reduce the complications of the disease. This study was conducted to determine the frequency and causes of death in patients with stroke referred to Zahedan city hospital in 2016.

METHODS

This cross-sectional retrospective study was performed on 320 patients hospitalized with diagnosis of stroke in Zahedan city hospital in 2016. Patients with traumatic injury, dyspraxia and brain infections were excluded from the study. Demographic data including age, sex and type of stroke, and outcome of the disease were extracted from patients files and were analyzed using statistical methods in SPSS v19. P value less than 5% was considered as significant.

RESULTS

The 59.7% of the all patients were male and the rest of them were female with a mean age of 63.2±13.9 years. There was no significant difference between the mean age of both sexes. Ischemic stroke was the most common type of stroke with 76.3%. The mean age of hemorrhagic stroke patients was significantly lower than that of ischemic patients, but the type of stroke was not related to the gender of the patients (Table 1).

The mortality rate in this study was 16.3%. There was no significant difference between the mean age of people who died with living people and the frequency of death in both genders was similar (Table 2).

The most common cause of death in stroke patients was aspiration pneumonia with 36.54% and then sepsis with 32.69%, respectively (Figure 1).

Table 1: Frequency and mean age of patients by stroke type.

Type of stroke	Sex				P-value	Mean ±SD	P-value
	Male		Female				
	N	%	N	%			
Ischemic	146	76.4	98	76	0.24	64.53±13.1	0.002
Hemorrhagic	45	23.6	31	24		58.8±15.3	

Table 2: Frequency and mean age of patients by disease outcome.

Disease outcome	Sex				P-value	Mean ±SD	P-value
	Male		Female				
	N	%	N	%			
Live	159	83.2	109	84.5	0.76	62.9±14	0.38
Dead	32	16.8	20	15.5		64.7±13.2	

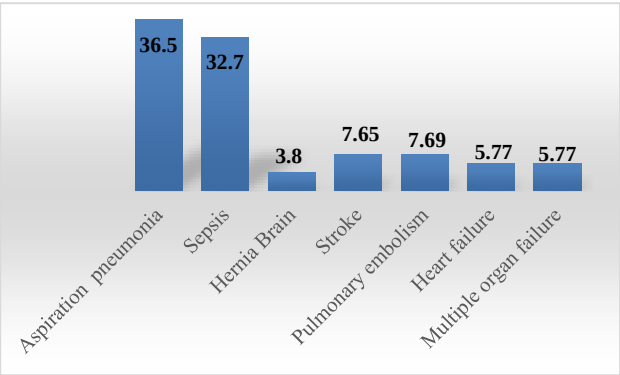

Figure 1: Frequency causes of death in stroke patient.

DISCUSSION

Stroke is the third cause of death and disability in adults. Each year, nearly 800,000 people in the United States suffer from stroke, of which 82-92% are ischemic. In this study, 59.7% of patients were male and the rest of them were female. The mean age of patients was 63.18±13.85 and the mean age of patients with ischemic stroke was significantly higher than hemorrhagic stroke (64 vs. 58 years). In a study on 4299 patients in South Korea in 2009, the average age of the patients was 62.6±13.3 years and the majority were male and in line with our study the average age of ischemic patients was significantly higher than other patients.[7] In another study by Cheung-Ter Ong

et al in 2014 , 2556 patients with ischemic stroke showed that 58% of the patients were male and the mean age of patients was 69.5 years, which was higher than the current study.[8] The results of a 5 year mortality study in patients aged 15-49 years with the first ischemic stroke showed that the mean age of patients was 41.5±7.4 and 62.8% were male.[9] In Firozabadi and et al study on 1219 patients with stroke, the mean age of patients was 69.6 years which was higher than the current study.[10] In the Hyeon Chang Kim study, ischemic stroke with 62.9% was the most common type of stroke.[7] The rate of mortality in our study was 16.3% that has not relat on with sex, age and type of stroke but in Kim study the rate of mortality in stroke patients was lower than other patients.[7] In Framingham and Rochester studies, the mortality from hemorrhagic and ischemic strokes were 28% and 19% after 30 days, respectively.[11]

In the study of Cheung-Ter Ong et al, the average age of the dead was significantly higher than that of the living subjects, while in the present study, there was no significant difference between the mean age of the deceased and the living individuals.[8] In the study of Firouzabadi, the prevalence of mortality among patients with stroke was 17.1%, which was significantly correlated with age and similar to the present study, it was high in ischemic type.[10] In the study of Yuan MZ and et al in 2017, 56% of patients were over 75 years of age and the mortality rate of patients was direct relation with age.[9] In the Ansa study, the results showed that the overall rate of hospital mortality was 7.8%, and the gender female and increasing heart rate as main predictors of mortality and so that in this study, there was no relationship between mortality and sex.[12] In this study, the most common cause of death in patients with stroke was pneumonia aspiration and then sepsis.

In the study of Yuan MZ et al, the cause of mortality was the central nervous system problems with 66.5% and brain hernia with 19.6% and also in the present study, brain hernia was one of the reasons for the death of female patients , which was not seen in male.[9] In another study, the causes of death in stroke patients were identified as vascular, cardio aortic, malignancies, and infectious, which was similar to the current study that infection was one of the cause of death.[13] In another study conducted by Kazumi Kimura and et al in 2009, the causes of mortality were cerebrovascular diseases with 24%, pneumonia with 23%, heart disease with 188%, cancer with 11%, and other factors with 24%.[14]

In another study by Michel Ferreira Machado and colleagues in 2012, the average age of patients was 66.6 years and 56% were male. The death rate was 11.9% and causes of death were pulmonary infections with 12.5%, heart disease with 12.5%, cancers with 10%, and opportunistic infections and other causes with 7.5%.[15] In another study by Steven Vernino and et al conducted in 2003 in the United States on 444 patients with cerebral infarction the causes of death in patients respectively were cardiovascular disease with 22%, pulmonary infections with 21%, complications of primary stroke with 14%, stroke of recurrent with 9% and cancer with 7.5%.[16] In general, comparing the results of this study with other studies in this field, it seems that Aspiration Pneumonia, Sepsis and cardiovascular disease were the cause of mortality in patients with stroke.

CONCLUSION

Results showed that the rate of mortality from stroke was higher in this study than in other studies. So, preventive precautions to prevent stroke can be effective and because of the most common cause of death was infectious causes such as aspiration pneumonia and sepsis, it is recommended that early assessments be made during the first hours of admission to determine the risk of aspiration and swallowing. Due to the limited number of samples in this study for reach to more precise results, more studies need to be done in future with larger sample sizes.

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REFERENCES

1. Gorelick PB, Farooq MU. Stroke: an emphasis on guidelines. Lancet Neurology. 2015;14(1):2-3.
2. Zhang Y, Chapman A-M, Plested M, Jackson D, Purroy F. The incidence, prevalence, and mortality of stroke in France, Germany, Italy, Spain, the UK, and the US: a literature review. Stroke research and treatment. 2012;2012.
3. Azarpazhooh M, Etemadi M, Donnan G, Mokhber N, Majdi M, Ghayour-mobarhan M, et al. Excessive incidence of stroke in Iran: evidence from the Mashhad stroke incidence study (msis), a population-based study of stroke. Inter J Stroke. 2010;5:207.
4. Ahangar AA, Vaghefi SBA, Ramaezani M. Epidemiological evaluation of stroke in Babol, northern Iran (2001-2003). Euro Neurol. 2005;54(2):93-7.
5. Schneider AT, Kissela B, Woo D, Kleindorfer D, Alwell K, Miller R, et al. Ischemic Stroke Subtypes. Stroke. 2004;35(7):1552-6.
6. Abbasi V, Amani F, Aslanian R, Hoseinkhani A, Zakeri A, Masoumi R. Epidemiological Study of Stroke in Ardabil, Iran: a Hospital Based-Study. 2017. J Neurolog Dis Stroke. 2017;5(2):1-5.
7. Ansa V, Bassey E, Ekrikpo U. Predictors of in-hospital mortality among stroke patients in Uyo, Nigeria. Port Harcourt Med J. 2012;6(2):170-5.
8. Ong C-T, Sung S-F, Wong Y-S, Wu C-S, Hsu Y-C, Su Y-H, et al. Risk Factors for In-Hospital Mortality among Ischemic Stroke Patients in Southern Taiwan. Inter J Gerontol. 2016;10(2):86-90.

9. Yuan Mz, Li F, Fang Q, Wang W, Peng Jj, Qin Dy, et al. Research on the Cause of Death for Severe Stroke Patients. J Clinical Nursing. 2017.
10. Firoozabadi MD, Kazemi T, Sharifzadeh G, Dadbeh S, Dehghan P. Stroke in Birjand, Iran: a hospital-based study of acute stroke. Iranian Red Crescent medical J. 2013;15(3):264.
11. Adams H, Davis P, Leira E, Chang K-C, Bendixen B, Clarke W, et al. Baseline NIH Stroke Scale score strongly predicts outcome after stroke A report of the Trial of Org 10172 in Acute Stroke Treatment (TOAST). Neurology. 1999;53(1):126.
12. Ansa V, Bassey E, Ekrikpo U. Predictors of in-Hospital mortality among stroke patients in Uyo, Nigeria. Port Harcourt Medical J. 2012;6(2):170-5.
13. Putaala J, Curtze S, Hiltunen S, Tolppanen H, Kaste M, Tatlisumak T. Causes of death and predictors of 5-year mortality in young adults after first-ever ischemic stroke. Stroke. 2009;40(8):2698-703.
14. Kimura K, Minematsu K, Kazui S, Yamaguchi T. Mortality and cause of death after hospital discharge in 10,981 patients with ischemic stroke and transient ischemic attack. Cerebrovas Dis. 2005;19(3):171-8.
15. Machado MF, Brucki SMD, Nogueira CF, Rocha MSG. Infectious disease is the most common cause of death among stroke patients: two-years of follow-up. Arquivos de neuro-psiquiatria. 2013;71(6):371-5.
16. Vernino S, Brown RD, Sejvar JJ, Sicks JD, Petty GW, O'Fallon WM. Cause-specific mortality after first cerebral infarction. Stroke. 2003;34(8):1828-32.

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