



Stroke Awareness of Physicians Working in a Tertiary Healthcare Institution

Üçüncü Basamak Bir Sağlık Kuruluşunda Çalışan Hekimlerde İnme Farkındalığı

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Abstract

Aim: To investigate the knowledge and awareness of physicians working in tertiary healthcare institutions concerning stroke and treatment approaches for ischemic stroke.

Material and Method: Fifty-nine physicians with a mean age of 35.4 years were included in the study. A survey consisting of 12 questions taking less than 5 minutes to complete was delivered to the specialist and research assistant physicians who were actively employed in Adıyaman University Faculty of Medicine Training and Research Hospital and signed the voluntary informed consent form.

Results: Of the physicians participating in the study, 66.1% (n=39) were working as specialists and 33.9% (n=20) as research assistant physicians. More than half the physicians (57.6%, n=34) had not previously attended an informative meeting on stroke. The average rate of correct answers given to all survey questions was 37.8%. The research assistant physicians correctly answered the questions concerning the first intervention in a stroke patient, prevalence of stroke, and thrombolytic treatment agent at a higher rate than the specialist physicians. The physicians who had previously attended an informative meeting on stroke provided more correct answers to the questions on stroke preventability and thrombolytic treatment agent.

Conclusion: Undoubtedly, since time is one of the most important factors affecting mortality and morbidity in case of an ischemic stroke, it is vital that both society and healthcare professionals become aware of this health condition. We believe that the awareness of all physicians concerning stroke and its treatment should be increased through effective training and informative meetings.

Keywords: Ischemic stroke, thrombolytics, awareness, thrombectomy, physician

Öz

Amaç: Çalışmamızın amacı 3. basamak sağlık kuruluşunda çalışan hekimlerin inme farkındalığı ve iskemik inme tedavi yaklaşımları hakkındaki bilgi birikimlerinin araştırılmasıdır.

Gereç ve Yöntem: Çalışmaya yaş ortalaması 35,4 olan 59 hekim dahil edilmiştir. Çalışmada Adıyaman Üniversitesi Tıp Fakültesi eğitim araştırma hastanesinde aktif olarak görev yapan, bilgilendirilmiş gönüllü onam formunu imzalayan uzman ve araştırma görevlisi hekimlere toplam 12 sorudan oluşan ve cevaplanması 5 dakikadan daha kısa süren anket formu ulaştırılmıştır.

Bulgular: Çalışmaya katılan hekimlerin %66,1'i (n=39) uzman hekim, %33,9'u (n=20) araştırma görevlisi olarak görev yapmaktaydı. Katılımcıların %57,6'sı (n=34) daha önce inme ile alakalı bir bilgilendirme toplantısına katılmamıştı. Tüm sorulara verilen ortalama doğru cevap oranı %37,8 olarak ölçüldü. İnme hastasının ilk müdahalesi, inme prevalansı ve trombolitik tedavi ajanı ile ilgili sorulara, araştırma görevlisi hekimlerin uzman hekimlere oranla daha yüksek oranda doğru cevap verdiği gözlemlenmiştir. İnme ile ilgili bilgilendirme toplantısına katılan hekimlerin, inmenin önlenilebilirliği ve trombolitik tedavi ajanı ile ilişkili sorulara, daha yüksek oranda doğru cevap verdiği gözlemlenmiştir.

Sonuç: İskemik inmede hastaların mortalite ve morbiditesini etkileyen en önemli faktörlerden biri kuşkusuz ki zamandır. Gerek toplumun gerekse sağlık çalışanlarının bu konuda bilinçlenmesi hayati öneme sahiptir. Tüm hekimlerin etkin eğitimler ve bilgilendirme toplantılarıyla inme ve inme tedavisi konusunda farkındalıklarının artırılmasına ihtiyaç olduğu kanaatindeyiz.

Anahtar Kelimeler: İskemik inme, trombolitik, farkındalık, trombektomi, hekim.



INTRODUCTION

Stroke refers to a sudden-onset, focal neurological condition that develops due to cerebrovascular disease. Of all stroke cases, 80-85% are ischemic and 15-20% are hemorrhagic. Stroke constitutes a major economic, medical and social problem that causes severe disability and ranks third among the global causes of death following cancer and cardiac diseases.^[1,2] The incidence of stroke can also vary between countries and even between people living in the same country, depending on race and geographical area. Studies have reported that the incidence of stroke is 1-3/1,000, and its prevalence is 6/1,000.^[3]

Effective treatment of stroke cases can be undertaken with the administration of an intravenous thrombolytic agent and endovascular mechanical thrombectomy treatment. According to the acute ischemic stroke guidelines of the American Stroke Association, in order to apply intravenous thrombolytics for the treatment of stroke, the time from the onset of the patient's symptoms to admission to a healthcare institution should be less than 4.5 hours. This time has been determined as 6 hours for endovascular mechanical thrombectomy treatment, but it has been reported that this treatment can be applied to selected patients within a period of 24 hours from the onset of symptoms.^[4]

All healthcare professionals should know the symptomatology of a stroke patient. For this reason, the FAST (Face, Arm, Speech, Time) test has been developed to quickly screen the symptoms of stroke. This test includes variables such as facial asymmetry, unilateral loss of strength in the arm, impaired speech and pronunciation, and rapid transfer of the patient to a healthcare facility.^[5] Stroke diagnosis and treatment is fixed in a narrow time frame that can be measured in hours. The slightest disruption in diagnosis and treatment can lead to very unfavorable consequences, considering that an average of 1.9 million neuronal cells dies per minute in an ischemic brain.^[6] The most decisive way to decrease morbidity and mortality rates in stroke patients is to use this limited time effectively as much as possible. The current study aimed to investigate the knowledge and awareness of physicians working in tertiary healthcare institutions concerning stroke and treatment approaches for ischemic stroke.

MATERIAL AND METHOD

In this study, a survey consisting of 12 questions that took less than 5 minutes to complete was delivered to the specialist and research assistant physicians who were actively working at Adiyaman University Faculty of Medicine Training and Research Hospital and signed the informed consent form. The questions in the survey were prepared in a multiple choice format and related to the subjects of stroke symptomatology, first intervention in stroke patients, and stroke treatment. Physicians working in neurology clinics, emergency medicine clinics and

intensive care units where stroke patients are followed up were not included in the study. It was also recorded whether the participants had previously attended an informative meeting on acute ischemic stroke and its treatment and whether they had previously intervened in a case with a stroke.

The survey comprised the following questions:

Is stroke a preventable disease?

Yes No

Is stroke a treatable disease?

Yes No

What is the unexpected clinical or examination finding in a patient diagnosed with a stroke?

- A) Speech disorder
- B) Imbalance in walking
- C) Visual impairment
- D) Chest pain

4. Which of the following should not be undertaken in the first intervention of a patient with a stroke?

- A) Blood glucose measurement
- B) Insertion of a urinary catheter
- C) Lowering blood pressure if it is high
- D) Insertion of a vascular catheter

5. Globally, what is the approximate percentage of hemorrhagic stroke among all stroke cases?

- A) 15 B) 30 C) 45 D) 50 E) 60

6. Which intravenous thrombolytic treatment agent is widely used in the treatment of acute ischemic stroke in the world and in Turkey?

- A) Tenecteplase
- B) Urokinase
- C) Streptokinase
- D) Alteplase

7. Up to how many hours after the onset of stroke symptoms can thrombolytic therapy be administered?

- A) 3 B) 4.5 C) 6 D) 8 E) 12

8. Up to how many hours after the onset of stroke symptoms can mechanical thrombectomy treatment be administered?

- A) 3 B) 4.5 C) 6 D) 8 E) 12

9. What is the absolute must-have imaging method that should be performed in a patient with a stroke before intravenous thrombolytic therapy?

- A) Brain magnetic resonance imaging
- B) Brain computed tomography
- C) Carotid doppler ultrasonography
- D) Brain magnetic resonance angiography
- E) Brain magnetic resonance venography

10. What is the approximate risk of developing symptomatic intracranial hemorrhage after intravenous thrombolytic therapy?

- A) 1 B) 5 C) 10 D) 15 E) 20

11. Which of the following is not one of the modifiable risk factors for stroke?

- A) Hypertension
 B) Diabetes
 C) History of previous stroke and transient ischemic attack
 D) Atrial fibrillation
 E) Obesity

12. Which of the following agents has no place in the secondary prevention of stroke patients?

- A) Warfarin
 B) Piracetam
 C) Clopidogrel
 D) Statin
 E) Rivoraxaban

Approval for the study was obtained from the Non-Interventional Clinical Research Ethics Committee of Adiyaman University (date: 16/03/2021, protocol number: 2021/3-29).

Statistical Analysis

Statistical analyses were carried out using SPSS version 22.0. The compliance of the variables to normal distribution was examined using histogram graphics and the Kolmogorov-Smirnov test. Categorical variables were compared using the Pearson's chi-square test. The Mann-Whitney U test was used when comparing non-parametric variables between the two groups. Results with a p value of less than 0.05 were evaluated as statistically significant.

RESULTS

With the survey, a total of 82 physicians were reached. After excluding 15 physicians who did not want to participate in the study and eight physicians who did not answer all the questions in the survey, the remaining 59 physicians were included in the study. Of the participants, 43 were male and 16 were female, with 66.1% (n=39) being specialists and 33.9% (n=20) research assistant physicians. The mean age of the participants was 35.4 years, and the mean professional experience was 10.4 years. Of the participants, 57.6% (n=34) had not previously attended an informative meeting on stroke. The rate of the participants who had previously intervened in a stroke case was 64.4% (n=38). The average rate of correct answers given to all questions was 37.8%. The rates of those who provided correct answers to the questions related to the treatability and preventability

of stroke were 96.9% and 89.7%, respectively. The rates of those who gave correct answers to the questions on stroke symptoms and the first intervention in a stroke patient were 84.5% and 63.7%, respectively. The questions concerning the latest times to apply thrombolytic and endovascular mechanical thrombectomy treatments from the onset of symptoms were correctly answered by 29.3% and 51.7% of the participants, respectively, and the rate of those answering both questions correctly was 18.6%. While the question on which intravenous thrombolytic treatment agent is commonly used in the treatment of acute ischemic stroke was answered correctly by 37.9% of the participants, the rate of those that were aware of the risk of symptomatic intracranial hemorrhage development after thrombolytic therapy was 20.7%. Of the participants, 31% correctly selected the imaging method that should be performed before thrombolytic therapy. The distribution of correct answers given to all questions is summarized in **Figure 1**. The rates of correct answers in the survey were compared between the specialist and research assistant physicians. According to the results, the rate of correct answers to the fourth, fifth and sixth questions was higher among the research assistant physicians (p=0.049, 0.035, and 0.044, respectively). Fifty-five percent of the research assistant physicians and 35.6% of the specialist physicians had previously attended an informative meeting on stroke, but the difference between the two groups was not statistically significant (p=0.160). However, it was observed that the research assistant physicians had intervened in a stroke case at a higher rate compared to the specialist physicians (p<0.001). The rates of correct answers given to the survey questions were also compared between the physicians who had previously attended an informative meeting on stroke and those who had not. Accordingly, the rate of correct answers to the first and fifth questions was higher among the physicians who had attended such a meeting (p=0.030 and 0.033, respectively). When the rates of correct answers to the survey questions were compared between the physicians who had previously treated a patient with a stroke and those who had not, the former was found to have a higher rate of correct answers for the fifth and 10th questions (p=0.009 and 0.025, respectively). Concerning the relationship between professional experience and the rate of correct answers, the mean time in the profession was significantly lower for those that correctly answered the fourth question compared to those that provided an incorrect answer for the same question (p=0.018). Examining the relationship between the age of the physicians and the rate of correct answers to the survey questions, it was determined that the mean age of those that gave correct answers to the sixth question was significantly lower than those that answered it incorrectly (p=0.025).

Table 1. Comparison of the correct answers given by the specialist and research assistant physicians

	Specialist physician (%)	Research assistant physician (%)	p
Question 1	92.3	85	0.325
Question 2	97.4	95	0.567
Question 3	87.2	80	0.357
Question 4	53.8	80	0.049
Question 5	46.2	75	0.035
Question 6	28.2	55	0.044
Question 7	28.2	30	0.885
Question 8	56.4	40	0.233
Question 9	25.6	40	0.257
Question 10	20.5	20	0.623
Question 11	79.6	80	0.623
Question 12	89.7	85	0.446
Previous attendance in informative meetings on stroke	35.9	55	0.160
Previous intervention in a stroke case	48.7	95	<0.001

Pearson's chi-square test

Table 2. Comparison of the correct answer rates according to previous attendance in informative meetings on stroke, previous intervention in a stroke case, age, and professional experience

	Previous attendance in informative meetings on stroke p	Previous intervention in a stroke case p	Age p	Professional experience p
Question 1	0.0301	0.295	0.706	0.633
Question 2	0.328	0.411	0.753	0.900
Question 3	0.415	0.163	0.688	0.783
Question 4	0.471	0.511	0.061	0.0182
Question 5	0.0331	0.0091	0.444	0.366
Question 6	0.361	0.303	0.0252	0.064
Question 7	0.906	0.218	0.893	0.644
Question 8	0.708	0.472	0.438	0.976
Question 9	0.432	0.155	0.178	0.306
Question 10	0.056	0.0251	0.473	0.940
Question 11	0.549	0.431	0.439	0.515
Question 12	0.328	0.196	0.906	0.787

¹ Pearson's chi-square test, ² Mann-Whitney U test

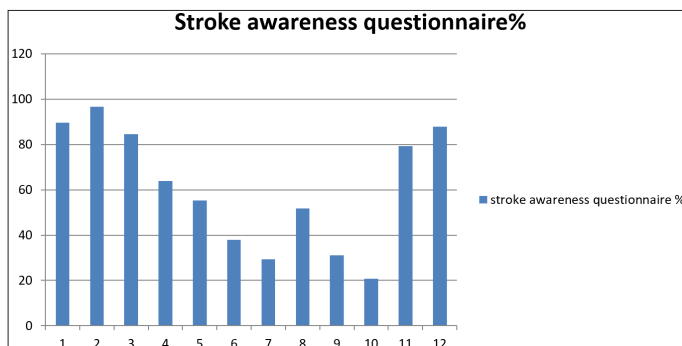


Figure 1. Distribution of correct answers to survey questions

DISCUSSION

Ischemic stroke is an emergency situation in which there is a race against time for the correct diagnosis, treatment and intervention. It is vital for physicians, who first come into contact with the patient and perform neurological and clinical evaluations, to know the symptoms, diagnosis and treatment algorithms to minimize mortality and morbidity. Our study showed that the physicians working in a tertiary healthcare facility did not have sufficient awareness of stroke and its treatment.

When a patient with stroke symptoms is encountered, the standard approach is to promptly perform clinical and neurological evaluations and transfer the patient to the nearest healthcare institution. The same sensitivity should be adopted in the approach to patients hospitalized for a different reason. For example, patients hospitalized for a non-neurological reason (diabetes, acute coronary syndrome, hypertension, surgery indication, etc.) are potential candidates for developing a stroke. It is very important that relevant relevant department physicians that follow up these patients and will make the first evaluation when an unexpected clinical finding occurs have sufficient awareness of stroke and its treatment. In these hospitalized patients, diagnosing stroke through a rapid evaluation will eliminate the time spent outside the hospital and shorten the time to reach treatment. Considering the high efficacy and low complication rate of early stroke treatment, the sensitivity of physicians who first evaluate these patients can significantly reduce the mortality and morbidity rates.

In the literature, there are population-based studies investigating stroke awareness.^[7-9] However, research measuring the stroke awareness of healthcare workers, especially physicians, remains limited. In a study conducted in the USA on nursing staff, it was observed that 85% of the participants had sufficient knowledge of the signs and symptoms of stroke.^[10] In a study conducted in Turkey in which family physicians' awareness of ischemic stroke was investigated, and it was found that the rate of correct answers to survey questions ranged between 20 and 30%.^[11] This is in agreement with the results obtained from the current study revealing that the rate of correct answers to all questions was 37.8%.

Multinational studies with a large number of patients have shown the functional positive effect of thrombolytic therapy and mechanical thrombectomy applied early in patients presenting with an ischemic stroke.^[12,13] Alteplase, an intravenous tissue plasminogen activator (iv-tPA) with thrombolytic function in ischemic stroke, is the only medical agent that offers disability-free survival and positively affects the prognosis when applied at an appropriate time.^[14] Today, the most important parameter that will positively affect the success of iv-tPA and the prognosis of ischemic stroke is the application time of thrombolytic therapy. Following the onset of stroke symptoms, the early administration of iv-tPA

increases efficacy and reduces the risk of complications.^[15] In our study, it was observed that the rate of correct answers to the questions related to the timing of both iv-tPA and mechanical thrombectomy was extremely low. More than 80% of the participants were not able to correctly answer both questions at the same time. The potential side effect of iv-tPA is undoubtedly a bleeding complication. Intracerebral bleeding and related clinical deterioration are rare but they are the most critical and feared side effects of iv-tPA.^[16] In the early period following the use of iv-tPA, the rate of intracranial bleeding has been reported as 6%.^[17] Similar to the treatment question, approximately 80% of the physicians participating in our study did not give a correct answer to the question related to the bleeding complication of iv-tPA. It is a cause for concern that ischemic stroke treatment, which has been widely used in Turkey for a decade, as well as its major complications are so under-recognized among physicians. Increasing the knowledge of physicians on this subject must be a primary goal.

In this study, we observed that the research assistant physicians correctly responded to the questions about the first intervention in a stroke patient, prevalence of stroke, and thrombolytic treatment agent at a higher rate than the specialist physicians. Similarly, we determined that the physicians with less professional experience correctly answered the question concerning the first intervention in a stroke patient at a higher rate, and those with a lower mean age correctly answered the question about the thrombolytic treatment agent at a higher rate. In addition, a higher rate of research assistant physicians were found to have previously intervened in a patient with a stroke. The physicians who had previously intervened in a stroke case also accurately responded to the questions related to the thrombolytic treatment agent and its complications at a higher rate. These results may be related to the young research assistant physicians spending more time in hospital and working more frequent shifts, which increases their possibility to encounter patients with a stroke. In addition, the physicians with a higher mean age that have specialized in their departments over many years may be providing outpatient services more frequently and they may have certain deficiencies in following the current advances in the field and fail to meet the requirements of dynamic medicine, which may have also contributed to our results. Our data revealed that the physicians who had previously attended an informative meeting on stroke gave more correct answers to the questions on the preventability of stroke and the thrombolytic treatment agent to be used. Although there was no significant difference in the rate of correct answers given to the remaining survey questions, the results generally indicated the necessity of organizing informative meetings on stroke for physicians.

This study has some limitations. First of all, the study population consists of a small group. In addition, since the study was conducted in a single center, the results may not reflect the generality.

CONCLUSION

Undoubtedly, since time is one of the most important factors affecting mortality and morbidity in patients with an ischemic stroke, it is vital that both society and healthcare professionals become aware of this health problem. We believe that the awareness of all physicians about stroke and its treatment should be increased through effective training and informative meetings.

ETHICAL DECLARATIONS

Ethics Committee Approval: Approval for the study was obtained from the Non-Interventional Clinical Research Ethics Committee of Adiyaman University (date: 16/03/2021, protocol number: 2021/3-29).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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