

ORIGINAL ARTICLE

ÖZGÜN ARAŞTIRMA

STROKE EPIDEMIOLOGY AND CLINICAL OUTCOMES IN ÇANKIRI CITY

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ABSTRACT

INTRODUCTION: This study aims to determine stroke incidence in Cankiri province and show demographic, etiologic, clinical presentations, risk factors and, clinical outcomes of patients with stroke followed up at Cankiri State Hospital in 2019. Thus it is aimed to contribute stroke data of Turkey and the world.

METHODS: The study was conducted retrospectively and was included the stroke patients follow in Cankiri State Hospital Clinic of Neurology between January 1, 2019, and December 31, 2019.

RESULTS: A total of 265 patients with stroke followed in our hospital in one year period. Of these patients, 84.5% had an ischemic stroke, 8.3% transient ischemic attack, 6.8% hemorrhagic stroke, 0.4% subarachnoid hemorrhage. The incidence of stroke was 124/100.000 per person-year in Cankiri province. The incidence of ischemic stroke was 114/100.000 per person-year, hemorrhagic stroke was 9/100.000 per person-year, the transient ischemic attack was 11/100.000 per person-year. When the ischemic and hemorrhagic strokes were compared according to mRS (modified Rankin Scale) scores before stroke, first week/discharge, and 3rd-month, no statistical difference was found ($p>0.05$). We assessed that the 30-day mortality rate of 3.8% in stroke patients.

DISCUSSION AND CONCLUSION: In our study, stroke incidence was found lower according to Turkey and world data. Moreover, it was determined that stroke patients' mean age was higher when compared to other studies. When we compare with other studies, our study's demographic, etiologic, and clinical features also have differences. The lower rates of the 30-day mortality of stroke patients draw attention.

Keywords: Stroke, epidemiology, incidence.

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Received: 28.02.2021

Accepted: 18.03.2021

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Please cite this article as following: Çubuk C, Efe Sayın C. Stroke epidemiology and clinical outcomes in Çankırı city. Turkish Journal of Cerebrovascular Diseases 2021; 27(1): 34-41. doi: [10.5505/tbdhd.2021.82474](https://doi.org/10.5505/tbdhd.2021.82474)

ÇANKIRI İLİ İNME EPİDEMİYOLOJİSİ VE KLİNİK SONUÇLARI

ÖZ

GİRİŞ ve AMAÇ: Çalışmamızda Çankırı ilinin inme insidansının hesaplanması ve 2019 yılı içerisinde Çankırı Devlet Hastanesi'nde inme tanısı ile takip edilen hastaların demografik, etyolojik, klinik özellikleri, risk faktörlerinin saptanması ve klinik sonuçlarının incelenmesi planlanmıştır. Bu sayede ülkemiz ve dünya inme verilerine katkıda bulunulması amaçlanmıştır.

YÖNTEM ve GEREÇLER: Çalışma retrospektif olarak yapılmış olup, 1 Ocak 2019-31 Aralık 2019 tarihleri arasında inme nedeniyle Çankırı Devlet Hastanesi Nöroloji Kliniğinde takip edilen hastalar dahil edilmiştir.

BULGULAR: Bir yıllık süre içerisinde hastanemizde 265 akut inme hastasının takip edildiği saptandı. İnme hastalarının %84.5'i iskemik inme, %8.3'ü geçici iskemik atak, %6.8'i hemorajik inme, %0.4'ü subaraknoid kanama olarak saptandı. İlin inme insidansı 124/100.000 kişi/yıl olarak saptandı. İskemik inme insidansı 114/100.000 kişi/yıl, hemorajik inme insidansı 9/100.000 kişi/yıl, geçici iskemik atak insidansı 11/100.000 kişi/yıl olarak değerlendirildi. İskemik inme ve hemorajik inmeler, inme öncesi, 1.hafta/taburcu ve 3.ay mRS (modified Rankin Scale) skorlarına göre karşılaştırıldığında anlamlı farklılık gözlenmedi ($p>0.05$). İnme hastalarının 30 günlük mortalite oranı %3.8 olarak saptandı.

TARTIŞMA ve SONUÇ: Çalışmamızda inme insidansı ülke ve dünya verilerine göre düşük olarak saptanmıştır. Ayrıca, inme hastalarının yaş ortalaması diğer çalışmalara göre yüksek olarak gözlenmiştir. Demografik, etyolojik, klinik veriler literatür sonuçları ile karşılaştırıldığında benzer özellikleri yanında farklılıkları da mevcuttur. İnme hastalarının 30 günlük mortalite oranı da çalışmamızda düşük olarak dikkati çekmektedir.

Anahtar Sözcükler: İnme, epidemiyoloji, insidans.

INTRODUCTION

Stroke is a global health problem, and its importance is increasing due to demographic changes in developing countries and the increase in the elderly population. Among the causes of other DALY (Disability Adjusted Life Year) loss in the world, stroke is the second most common cause of ischemic heart disease in developing countries and worldwide, and the third most common cause in developed countries (1). In our country also, stroke is the second leading cause of death (2). In the 2017 Global Disease Burden Study of stroke, the age-standardized incidence rate was found to be 150.5 per 100,000. (3). In our country, the incidence of stroke has been reported as 177/100,000, and its prevalence as 254/100,000. (2).

The province of Çankırı, where we conducted this research, is situated in northern Central Anatolia, between the major basins of the Kızılırmak and the Western Black Sea, at 40° 30' and 41° north latitudes and 32° 30' and 34° east longitudes. The city center is 720 meters above sea level (4). According to the Turkey Statistical Institute data, the population of the province of Çankırı has been identified as 195.789 as of the year 2019 (5).

It was planned in this study to quantify the occurrence of patients who presented to our hospital with the diagnosis of acute stroke in 2019, as well as to display their demographic data,

etiology, risk factor distribution, and clinical outcomes. In this way, it was aimed to contribute to the acute stroke data of our country and the world.

METHODS

Patients who were followed in the Neurology Clinic of Çankırı State Hospital for stroke between January 1, 2019, and December 31, 2019, were included in the research, which was performed retrospectively. Çankırı State Hospital is situated in the city center, and since there are no Neurology Clinics or Neurology Specialists in the district state hospitals, it is the city's only treatment center for acute stroke patients. In addition, it is the only center authorized to refer stroke patients outside the province. Therefore, the stroke data of Çankırı State Hospital reflect all the stroke data of the province.

This study was carried out in compliance with the Helsinki Declaration's ethical principles and was approved by the Karabük University Faculty of Medicine Non-Interventional Research Ethics Committee (Date: 25.02.2021, Number: 2021/485).

Stroke patients; included patients diagnosed with ischemic stroke, hemorrhagic stroke, transient ischemic attack, and subarachnoid hemorrhage. The information on the most recent admission of patients who had several hospitalizations due to acute stroke was used.

Based on these data, 265 patients diagnosed with stroke were included in the study. It was found that patients with a history of stroke had their previous stroke at least twice and at most 14 years ago. It was found that none of the patients applied to our hospital again in 2019 with a stroke type different from the type of stroke they had. These patients' information was derived from patient reports and hospital data processing records. 26 patients with ischemic stroke were treated with intravenous thrombolytic therapy and monitored in our hospital's intensive care unit. These patients were not referred to an advanced center. Four of the patients diagnosed with ischemic stroke were referred for mechanical thrombectomy. Clinical and laboratory information of these patients were obtained during the controls of our hospital's Neurology outpatient clinic.

Demographic information, risk factors, body mass index, stroke type, ischemic stroke etiologies, hemorrhagic stroke locations were determined. The incidence calculations, Turkey Statistical Institute (TSI) population data by province, age group, and gender were used (5). The age classification of stroke patients was classified into 6 groups as 20-45, 45-54, 55-64, 65-74, 75-84, and ≥ 85 . In the classification of the cause of ischemic stroke, the classification described in the Org 10172 Study in Acute Stroke Treatment was used (6). Ischemic stroke syndromes were classified as anterior (carotid system) and posterior circulation (vertebrobasilar system) strokes as defined in the World Health Organization's 1989 Stroke Report (7). Hemorrhagic stroke classification was defined as putamino-capsulo, hemispheric white matter (lobar), thalamus, cerebellum, basal ganglia, caudate nucleus, and brain stem (8). Hemogram, coagulation and biochemical tests, lipid profile, electrocardiography, echocardiography, and carotid vertebral ultrasonography tests were performed for all patients included in the study. Brain computed tomography imaging of all patients was performed in the emergency department. Brain magnetic resonance imaging, MR-angiography, and 24-hour rhythm Holter recording were performed for the required patients. The patients' pre-stroke, discharge, and 3rd-month mRS (modified Rankin Scale) scores were evaluated. In the mRS scoring, scores between 0-2 were defined as independent, and scores between 3-5 as dependent.

IBM SPSS Statistics Version 20.0 software was used for the statistical analysis of the data. The categorical variables were presented as numbers and percentages. The numerical variables were presented as mean and standard deviation (with the median and minimum/maximum values when necessary). Chi-square test statistics were used to compare categorical measurements between groups. The level of statistical significance was accepted as 0.05 in all the tests.

RESULTS

The mean age of 265 patients included in the study was 73 (72.66 ± 11.71). It was determined that the average age of ischemic stroke patients was 74 (73.69 ± 10.90), the average age of hemorrhagic stroke patients was 69 (68.56 ± 12.22), and the average age of transient ischemic attack patients was 65 (65.09 ± 15.87). The age of one patient with subarachnoid hemorrhage was 82 years old. In Table 1, we see in detail the demographic data, risk factors, and distribution of body mass indexes of all cases included in the study. Stroke was detected as ischemic stroke in 84.5% of the patients, transient ischemic attack in 8.3%, hemorrhagic stroke in 6.8%, and subarachnoid hemorrhage in 0.4% of the patients. 11.6% ($n=26$) of ischemic stroke patients received intravenous thrombolytic therapy. In Table 2, the distribution of demographic data, risk factors, and body mass indexes is given according to stroke types. 25 (11.2%) of the ischemic stroke patients have a history of prior stroke; 23 of these patients were found to have an ischemic stroke and 2 had a hemorrhagic stroke. It was determined that 3 of 5 (27%) patients who had a hemorrhagic stroke had a previous hemorrhagic stroke, and 2 patients had an ischemic stroke. It was learned that three (13.6%) of the patients who had transient ischemic attacks had previously had an ischemic stroke. It was learned that 1 patient who had subarachnoid hemorrhage had no previous history of stroke.

Stroke incidence was found to be 124/100,000 people/year. The incidence of ischemic stroke was evaluated as 114/100,000 people/year, hemorrhagic stroke incidence as 9/100,000 people/year, and the incidence of transient ischemic attack as 11/100,000 people/year. The incidence of male ischemic

stroke was 123/100,000 people/year, and the incidence of female ischemic stroke was found to be 106/100,000 people/year. The incidence of male hemorrhagic stroke was determined as 11/100,000 people/year and the incidence of female hemorrhagic stroke was determined as 7/100,000 people/year. The incidence of male transient ischemic attacks was 13/100,000 people/year, and the incidence of female transient ischemic attacks was evaluated as 9/100,000 people/year. The frequency of strokes is shown in Table 3 by age group and gender.

Small vessel disease in 41.9% (n=111) of ischemic stroke patients, cardioembolic etiology in 36.2% (n=96), large vessel disease in 10.2% (n=27), 4.5% (n=12) unknown etiology was detected. 72.8% (n=163) of ischemic strokes were considered as anterior circulation and 27.2% (n=61) of them were considered as posterior circulation. Of the hemorrhagic stroke patients, 44.4% (n=8) were determined as the thalamus, 33.3% (n=6) as the lobar, 16.7% (n=3) as the basal ganglia and 5.6% (n=1) as the putamino-capsulo regions.

Table 4 shows the distribution of pre-stroke, 1st week/discharge, and 3rd-month mRS scores by

stroke types. There was no significant difference between ischemic and hemorrhagic strokes based on pre-stroke, 1st week/discharge, and 3rd-month mRS scores (p> 0.05).

The 30-day mortality rate of stroke patients was determined to be 3.8% (n=10), and all of these patients were followed up due to ischemic stroke. The 30-day mortality rate of ischemic stroke patients was evaluated as 4.5%. The average age of the patients who died was found to be 77 (77.4±6.31).

Table 1. Demographic data, risk factors, and BMI distribution of the patients.

		N= 265 (%)
Gender	Male	145 (54.7)
	Female	120 (45.3)
Smoke		84 (31.7)
Alcohol		8 (3)
Hypertension		180 (67.9)
Diabetes Mellitus		158 (59.6)
Coronary Artery Disease		43 (16.2)
Hyperlipidemia		108 (40.8)
History of Stroke		33 (12.5)
Atrial Fibrillation		66 (24.9)
Body Mass Index (BMI)	<18.5 (underweight)	1 (0.4)
	18.5-24.9 (normal)	182 (68.7)
	25-29.9 (overweight)	79 (29.8)
	30-39.9 (obese)	3 (1.1)

Table 2. Distribution of demographic data, risk factors, and body mass indexes by stroke types.

		Ischemic Stroke n (%)	Hemorrhagic Stroke n (%)	Transient Ischemic Attack n (%)	Subarachnoid Hemorrhage n (%)
Gender	Male	121 (54)	11 (61.1)	13 (59.1)	0
	Female	103 (46)	7 (38.9)	9 (40.9)	1 (100)
Smoke		67 (29.9)	7 (38.9)	10 (45.5)	0
Alcohol		6 (2.7)	2 (9.1)	2 (9.1)	0
Hypertension		151 (67.4)	15 (83.3)	14 (63.6)	0
Diabetes Mellitus		136 (60.7)	10 (55.6)	12 (54.5)	0
Coronary Artery Disease		32 (14.3)	4 (22.2)	6 (27.3)	1 (100)
Hyperlipidemia		96 (42.9)	3 (16.7)	8 (36.4)	1 (100)
History of Stroke		25 (11.2)	5 (27.8)	3 (13.6)	0
Atrial Fibrillation		58 (25.9)	4 (22.2)	3 (13.6)	1 (100)
Body Mass Index (BMI)	<18.5 (underweight)	1 (0,4)	14 (77.8)	19 (86.4)	0
	18.5-24.9 (normal)	148 (66.1)	4 (22.2)	3 (13.6)	1 (100)
	25-29.9 (overweight)	72 (32.1)	0	0	0
	30-39.9 (obese)	3 (1.3)	0	0	0

Table 3. Stroke incidence by age and gender.

Age	Female			Male			Total		
	Population	Case	Incidence*	Population	Case	Incidence*	Population	Case	Incidence*
20-44	25843	1	4	34911	2	6	60754	3	5
45-54	11993	5	42	12145	6	49	24138	11	46
55-64	12901	11	85	12779	21	164	25680	32	125
65-74	9975	30	301	8772	46	524	18747	76	405
75-84	5601	41	732	4199	39	929	9800	80	816
≥85	1827	23	1259	1254	18	1435	3081	41	1331

*100,000 people/year

Table 4. Distribution of the modified Rankin Scale according to stroke types according to pre-stroke, 1st week and 3rd month scores.

		Ischemic Stroke n (%)	Hemorrhagic Stroke n (%)	p
mRS	0-2	218 (97.3)	18 (100)	1.000
Before stroke	3-6	6 (2.7)	0	
mRS 1.	0-2	159 (71)	10 (55.6)	0.269
Week/Discharge	3-6	65 (29)	8 (44.4)	
mRS	0-2	179 (79.9)	16 (88.9)	0.538
3. Month	3-6	45 (20.1)	2 (11.1)	

DISCUSSION AND CONCLUSION

Globally, in 2017, it was found that 64.9% of all strokes were ischemic stroke, 26.2% was primary intracerebral hemorrhage, and 8.9% was subarachnoid hemorrhage (3). It has been determined that approximately 85% of strokes in the United States of America (USA) are ischemic strokes (9). In our research, 84.5% of stroke patients had an ischemic stroke, 8.3% had TIA, 6.8% had a hemorrhagic stroke, and 0.4% had subarachnoid hemorrhages. According to global data, although our study has methodological differences, it can be said that the rate of ischemic stroke is high, whereas the rates of hemorrhagic stroke and subarachnoid hemorrhage are low. It is also noteworthy that the rate of ischemic stroke is similar to the USA. Although there are few epidemiology studies in our country, in a cross-sectional study conducted by Şensöz et al. in Karabük, the neighboring province of Çankırı, it was determined that 86% of all strokes were ischemic strokes and 14% were hemorrhagic strokes (10). In comparison to other research performed in our country, Altun et al. found that 87.8% of all strokes were ischemic strokes and 8.6% were hemorrhagic strokes (11). Inanc et al. evaluated 80.6% of all strokes as ischemic and 19.4% as hemorrhagic strokes (12). In Ardahan province, 71.4% of all strokes were ischemic stroke, 20.4% were hemorrhagic stroke, 2.6% were transient ischemic attacks, and 2.6% were subarachnoid hemorrhage (13). In our study, we observe similar data in terms of ischemic stroke distribution.

In the INTERSTROKE study, the average age of ischemic and hemorrhagic strokes was found to be 62.2, and the average age in the eastern and central Europe and middle east regions of our country was determined as 63.9 (14). Şensöz et al. determined the average age to be 69.9 (10). Altun

et al. found that the average age of all ischemic strokes to be 71.7 in Adıyaman (11). Inanc et al., on the other hand, determined the average age of all strokes to be 67.9 in the province of Sanliurfa (12). In our study, the average age of all stroke patients was found to be 73, and it is noteworthy that it is higher than in the literature. According to 2019 TÜİK data, Çankırı was determined to be the third province with the highest rate of the elderly population, along with Artvin. 16.2% of the provincial population is 65 years and older (5). It is thought that this is why the average age of stroke patients seen in our study was high. Female gender was observed at a rate of 40.4% in the INTERSTROKE study, and female gender was found to be 39.9% in stroke patients in eastern and central Europe and the middle east region of our country (14). In an epidemiology study conducted in Karabük, a neighbor of Çankırı, 58.1% of the patients who had a stroke were reported to be women (10). In other studies conducted in our country, 49.2% of the stroke patients in Adıyaman and 45.4% in the province of Şanlıurfa were determined as women (11,12). In our study, 45.3% of the stroke patients were women, and it was found in accordance with the data of our country and the world.

In our country, the incidence of stroke was found to be 177/100,000 and the prevalence to be 254/100.00 (2), in our study, the incidence of acute stroke in Çankırı was determined to be 124/100,000 people/year in Çankırı. In the Global Burden of Disease Study in 2017, the data obtained from 195 countries in 27 years were analyzed, and the global age-standardized incidence rate of stroke was found to be 150.5 per 100,000 (3). The country with the highest age-standardized incidence rate is China with 226/100,000 people/year, followed by Afghanistan with 224/100,000 people/year. New Zealand stands out with the lowest incidence rate of 79/100,000 (3). It was determined that Latvia, Lithuania, and China (156-159/100,000 people/year) are the countries with the highest rates of ischemic stroke, while Colombia, Guatemala, Costa Rica are the lowest countries (47-52/100,000 people/year) (3). The incidence of acute ischemic stroke was found to be 114/100,000 people/year in our study. When compared with epidemiological studies conducted in our country, the incidence of stroke in Ardahan was found to be 199/100,000 people/year. In the

same study, the annual incidence of ischemic stroke was determined as 142/100.000 people/year, the annual incidence of male ischemic stroke was 147/100.000 people/year, and the annual incidence of female ischemic stroke was 137/100.000 people/year. The incidence of hemorrhagic stroke was detected as 41/100,000 people/year, the incidence of male hemorrhagic stroke is 37/100,000 people/year, and the incidence of female hemorrhagic stroke is 44/100,000 people/year. In addition, the incidence of ischemic stroke under 45 years of age was found to be 5/100,000 people/year, and in our study, it was acute stroke incidence was found to be 5 / 100,000 people / year (13). The age-standardized incidence of transient ischemic attacks in the European population has been found in the range of 28-59/100,000 people/year (15). In our study, the incidence of transient ischemic attacks was determined as 11/100,000 people/year. We can say that our study has methodological differences and the low incidence rates are remarkable according to country and world data.

In our study, 41.9% of ischemic stroke patients had small vessel disease, 36.2% had cardioembolic etiology, 10.2% had large vessel disease, and 4.5% had an unknown etiology. When the stroke etiology of patients with ischemic stroke is examined in the study of Lee et al. 42% large vessel disease, 31% small vessel disease, 8.7% cardioembolic etiology, 18.3% unknown, and other causes were determined (16). In the study of Grau et al., 20.9% large vessel disease, 20.5% small vessel disease, 25.6% cardioembolism, and other and unknown causes in 33% were determined in patients with ischemic stroke (17). It is noteworthy that the rates of small vessel disease and cardioembolic etiology were observed at a higher rate in patients with ischemic stroke in our study. Besides, 72.8% of ischemic strokes were determined as the anterior circulation and 27.2% were determined as the posterior circulation. Inanc et al. found that 56.3% of ischemic strokes were anterior system infarction and 23.2% were posterior system infarction (12). In the INTERSTROKE study, ischemic strokes in Eastern and Central Europe, including our country, in the middle east; 5.6% was evaluated as total anterior circulation, 49.4% as partial anterior circulation, 20.8% as posterior circulation, 20.9% as lacunar infarct, and 3.3% as undetectable localization (14).

It is noteworthy that the rate of anterior circulation stroke was higher in our study.

Looking at the relationship between stroke and body mass index (BMI), it was found that a 5-unit increase in BMI increased the risk of stroke 1.1 times. According to the stroke subtypes, a 5 unit increase in BMI increases the risk of ischemic stroke 1.2 times and the risk of hemorrhagic stroke 0.99 times. In addition, the relationship between BMI and stroke shows a "J" shaped curve, and at the lower point of this curve, the BMI was observed as 23-24 kg/m² (18). In our study, 30.9% of stroke patients had BMIs of 25 kg/m² or more.

When evaluated in terms of localization distribution in hemorrhagic strokes, basal ganglia and thalamus draw the most attention in the literature in the study of Lee et al. (55% basal ganglia, 23% thalamus, 10% cerebral hemisphere, 6% pons, 6% cerebellum) (16). In an epidemiological study conducted in the province of Ardahan in our country, hemorrhagic strokes were found in 45% basal ganglia, 22.5% thalamus, 17.5% lobar, 7.5% brainstem, and 7.5% cerebellar regions, respectively (13). Localizations of the thalamus, lobar, basal ganglia, and putamino-capsulo were observed in hemorrhagic stroke patients in order of frequency in our research.

In the meta-analysis of Khatib et al., it is found that among stroke risk factors, hypertension with 64% was most common, smoking with 25%, diabetes mellitus with 23%, a history of stroke with 15%, atrial fibrillation with 10%. In the same study, 65% hypertension, 35% smoking, 26% diabetes mellitus, 18% stroke history, and 10% atrial fibrillation were found in upper-middle-income countries, respectively (19). Turkey, according to World Bank data among the upper-middle-income countries (20) considering our study of stroke risk factors is most frequently associated with hypertension 67.9%, after respectively, 59.6% diabetes mellitus, 40.8%, hyperlipidemia, 31.7% of smoking, 24.9% atrial fibrillation, 16.2% coronary artery disease, 12.5% stroke history, 3% alcohol use were found. Looking at the stroke risk factors of Şensöz et al.; 72.1% hypertension, 44.2% hyperlipidemia, 37.2% heart disease, 34.9% diabetes mellitus, 12.4% smoking, 2.3% alcohol use are observed (10). In the study of Altun et al., they determined the risk factors for stroke as 65.6% hypertension, 35.4% heart disease, 34.7% hyperlipidemia, 29.6% diabetes mellitus, 13.6 % atrial fibrillation, and

8.8% previous ischemic stroke (11). Among the stroke risk factors in Ardahan province, 61.7% hypertension, 26.5% diabetes mellitus, 25% heart disease, 23.5% smoking and 13.3% past stroke history are remarkable. Besides, atrial fibrillation was found in 32.9% of patients with ischemic stroke (13). In our study, atrial fibrillation was observed in 25.9% of patients with ischemic stroke. Although the data in our study confirm the most common existence of hypertension in the etiology of stroke, smoking was found close to the data of upper-middle-income countries. It was noteworthy that diabetes mellitus and atrial fibrillation were observed at higher rates in our study. The frequency of atrial fibrillation increases with advanced age (21). The higher rate of atrial fibrillation in our study was thought to be due to the high average age. Hypertension, hyperlipidemia, and alcohol use were observed at similar rates with regional data (10).

In the literature, the rate of administering intravenous thrombolytic therapy (IV-tPA) to patients with ischemic stroke was found to be 3%, and this rate was found to be 1% in upper-middle-income countries and 24% in low-middle-income countries (19). The use of IV-tPA in high-income countries has been reported to be close to 30% (22). In our research, 11.6% of patients with ischemic stroke received intravenous thrombolytic therapy. The reason for the high rate of IV-tPA in our study is that alteplase can be applied to all patients within the indication because it is covered by insurance in our country.

In the INTERSTROKE study, the stroke patients whose 1st-month mRS scores are between 3-6 were found to be 37.6%, and it was 28.1% for those in Eastern and Central Europe and Middle East Region, including Turkey (14). In our study, those with mRS scores between 3-6 at the 1st week/discharge after ischemic stroke were 29%, and those with mRS scores between 3-6 at the 3rd month were 20.1%. Those with mRS scores between 3-6 at the 1st week/discharge after hemorrhagic stroke were 44.4%, and those with 3-6 mRS scores at the 3rd month were found to be 11.1%. Besides, when the mRS scores of ischemic and hemorrhagic strokes were compared, no significant difference was found (Table 4). In our study, the 30-day mortality rate of stroke patients was determined as 3.8%, and the 30-day mortality rate of ischemic stroke patients was determined as 4.5%. Brown et al. detected the 30-day mortality

rate after the first stroke in Turkey as 19.7% (23). When the literature data were evaluated, the 30-day mortality rate was observed to be low in our study (24). The reason for this can be predicted as the widespread use of intravenous thrombolytic therapy in ischemic stroke, the support of interventional neurology teams, and improvements in intensive care facilities. In a study conducted in the province of Ardahan (13), the average age of patients who died from a stroke was found to be 79, while in our study, it was found to be 77.

In conclusion, this study aimed to compare the demographic, etiological, and clinical results of stroke patients in Çankırı with the literature data and to emphasize their similar aspects and differences. These data are intended to contribute to our country's and global stroke data. Besides, it is seen that we need more epidemiological studies in our country.

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Ethics

Ethics Committee Approval: The study was approved by Karabük University Medical Faculty Noninterventional Research Ethics Committee (Number: 2021/485, Date: 25.02.2021).

Informed Consent: No informed consent was obtained from the patients because of the retrospective study method.

Authorship Contributions: Surgical and Medical Practices: CÇ. Concept: CÇ. Design: CÇ. Data Collection or Processing: CÇ, CES. Analysis or Interpretation: CÇ, CES. Literature Search: CÇ. Writing: CÇ.

Copyright Transfer Form: Copyright Transfer Form was signed by all authors.

Peer-review: Internally peer-reviewed.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.