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STUDY OF HOSPITALIZED CASES ASSOCIATED WITH ACUTE CEREBROVASCULAR ACCIDENTS

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Abstract

Background. Proper organization of the system for providing medical care to patients with cerebral stroke will reduce mortality and reduce the level of disability. All activities are aimed at creating unified principles of diagnostic approaches and management of patients with stroke. A significant role is given to primary prevention by optimizing the system of medical care for stroke patients. Coordinating centers for cerebrovascular pathology and stroke are being created

Aim to analyze cases of hospitalization of patients with acute cerebrovascular accidents from 2012 to 2022 in Almaty city.

Materials and Methods. A retrospective study was conducted. The data analysis period was from 2012 to 2022. The analysis data included the age of the patients, the days spent in bed, the outcome of the disease, and emergency or planned admissions. Data analysis was carried out using the SPSS 13 program.

Results. The age of patients with acute cerebrovascular accidents fluctuated within 10 years in the range of 59.8 as well as bed days was 11.46. The number of emergency hospitalizations was higher in comparison to planned; however, it was positive dynamics in the last five years. In addition, from 2012 the mortality rate decreased, whereas recovery increased, which means there are better results and access to health facilities.

Conclusion. The introduction of stroke programs, as well as improvements in primary health care, has allowed us to improve care for patients. While the prevention and treatment programs still need to be continually improved, considering age, gender, and risk factors and other factors.

Keywords*: acute cerebrovascular accidents, stroke, hospitalization, bed-days; Kazakhstan.*

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Резюме

ИЗУЧЕНИЕ ГОСПИТАЛИЗИРОВАННЫХ СЛУЧАЕВ, СВЯЗАННЫХ С ОСТРЫМИ НАРУШЕНИЯМИ МОЗГОВОГО КРОВООБРАЩЕНИЯ

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Введение. Правильная организация системы оказания медицинской помощи пациентам с церебральным инсультом позволит снизить смертность и снизить уровень инвалидности. Все мероприятия направлены на создание единых принципов диагностических подходов и ведения пациентов с инсультом. Значительная роль отводится первичной профилактике путем оптимизации системы оказания медицинской помощи пациентам, перенесшим инсульт. Создаются координационные центры по цереброваскулярной патологии и инсульту

Цель: анализ случаев госпитализации пациентов с острыми нарушениями мозгового кровообращения в период с 2012 по 2022 год в городе Алматы.

Материалы и методы. Было проведено ретроспективное исследование. Период анализа данных составлял с 2012 по 2022 год. Данные анализа включали возраст пациентов, дни, проведенные в постели, исход заболевания, экстренную или плановую госпитализацию. Анализ данных проводился с помощью программы SPSS 13.

Результаты. Возраст пациентов с острыми нарушениями мозгового кровообращения колебался в течение 10 лет в диапазоне 59,8, а количество койко-дней составило 11,46. Количество экстренных госпитализаций было выше по сравнению с запланированными, однако за последние пять лет это была положительная динамика. Кроме того, с 2012 года уровень смертности снизился, в то время как выздоровление увеличилось, что означает лучшие результаты и прием в медицинские учреждения.

Вывод. Внедрение программ по борьбе с инсультом, а также улучшения в первичной медико-санитарной помощи позволили нам улучшить уход за пациентами. В то время как программы профилактики и лечения по-прежнему нуждаются в постоянном совершенствовании с учетом возраста, пола, факторов риска и других факторов.

Ключевые слова: *острые нарушения мозгового кровообращения, инсульт, госпитализация, койко-дни; Казахстан.*

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Түйіндеме

ЖЕДЕЛ ЦЕРЕБРОВАСКУЛЯРЛЫҚ БҰЗЫЛУЛАРМЕН БАЙЛАНЫСТЫ АУРУХАНАҒА ЖАТҚЫЗЫЛҒАН ЖАҒДАЙЛАРДЫ ЗЕРТТЕУ

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Анықтама. Церебральды инсультпен ауыратын науқастарға медициналық көмек көрсету жүйесін дұрыс ұйымдастыру өлімді азайтуға және мүгедектік деңгейін төмендетуге мүмкіндік береді. Барлық іс-шаралар диагностикалық тәсілдердің бірыңғай қағидаттарын құруға және инсультпен ауыратын науқастарды басқаруға бағытталған. Инсультпен ауыратын науқастарға медициналық көмек көрсету жүйесін оңтайландыру арқылы алғашқы профилактикаға маңызды рөл беріледі. Цереброваскулярлық патология және инсульт бойынша үйлестіру орталықтары құрылуда

Мақсаты 2012-2022 жылдар аралығында Алматы қаласында ми қан айналымы жіті бұзылған пациенттерді емдеуге жатқызу жағдайларын талдау болып табылады.

Материалдар мен Әдістері. Ретроспективті зерттеу жүргізілді. Деректерді талдау кезеңі 2012 жылдан 2022 жылға дейін болды. Талдау деректері пациенттердің жасын, төсекте өткізген күндерін, аурудың нәтижесін, шұғыл немесе жоспарлы ауруханаға жатқызуды қамтыды. Деректерді талдау SPSS 13 бағдарламасы арқылы жүргізілді.

Нәтижелер. Жедел цереброваскулярлық бұзылулары бар науқастардың жасы 10 жыл ішінде 59,8 диапазонында өзгерді, ал төсек күндері 11,46 болды. Шұғыл ауруханаға жатқызу жоспарланғанмен салыстырғанда жоғары болды, бірақ соңғы бес жылда бұл оң динамика болды. Сонымен қатар, 2012 жылдан бастап өлім-жітім деңгейі төмендеді, ал қалпына келтіру өсті, бұл жақсы нәтижелер мен медициналық мекемелерге қабылдауды білдіреді.

Қорытынды. Инсультті емдеу бағдарламаларын енгізу, сондай-ақ алғашқы медициналық-санитарлық көмекті жақсарту пациенттерге күтім көрсетуді жақсартуға мүмкіндік берді. Алдын алу және емдеу бағдарламалары әлі де жасына, жынысына, қауіп факторларына және басқа факторларға байланысты үнемі жетілдіруді қажет етеді.

***Түйін сөздер**: ми қан айналымының жіті бұзылуы, инсульт, ауруханаға жатқызу, төсек-күндер; Қазақстан*

Дәйексөз үшін:

Кастей Р., Файзуллина К., Турганова М., Жексенова А., Вайчюлис В., Ахтаева Н. Жедел цереброваскулярлық бұзылулармен байланысты ауруханаға жатқызылған жағдайларды // Ғылым және Денсаулық сақтау. 2025. Vol.27(1), Б. 49-55. *doi 10.34689/SH.2025.27.1.006*

Introduction

Acute cerebrovascular accident is one of many other pressing problems around the world with depressing rates of morbidity and mortality, as well as disability. Stroke is characterized as a neurological deficit associated with acute focal damage to the central nervous system from a vascular cause [16]. Cerebrovascular disease, which includes ischemic and hemorrhagic stroke, is the third most common cause of death worldwide, with a mortality rate of 86.5 per 100,000 person-years [5]. More than 700 thousand people suffer from stroke each year in the United States, up to 500 thousand people in Canada, up to 1 million people in the European Union, and in the world the number of cases can reach 10 million. The average prevalence of stroke is 200 cases per 100 thousand population annually, although it varies in different regions and depends on race and many other factors [3]. A systematic and meta-analysis found that over the past 40 years, the overall incidence of intracerebral hemorrhage is 29.9 per 100,000 person-years, which has not decreased worldwide, where the incidence in Asian populations is significantly higher than in other continents [20]. Another systematic review found that the cumulative incidence of intracerebral hemorrhage was highest in lower-middle-income countries [7]. Epidural hematomas are present in approximately 2% of patients with traumatic brain injury and account for 5% to 15% of fatal head injuries. The incidence of subdural hematoma is estimated to be between 5% and 25% of patients with major head trauma, while subarachnoid hemorrhage accounts for approximately 5% of all strokes and occurs in approximately 2 to 25 per 100,000 person-years among persons over 35 years of age, and also, intraparenchymal hemorrhages account for 10% to 20% of all strokes [18]. The authors note that globally in 2019, the cost of lost wealth due to stroke was $2059.67 billion, or 1.66% of global GDP; of the subtypes for ischemic stroke was $882.81 billion) for intracerebral hemorrhage was $212.36 billion US dollars, for subarachnoid hemorrhage [4].

In the Republic of Kazakhstan, strokes are in third place in terms of prevalence after diseases of the circulatory system and malignant tumors. According to statistics, in 2015, more than 40 thousand Kazakhstanis suffered a stroke, of which in 24% of cases it was fatal. The incidence in the country ranges from 2.5 to 3.7 cases per 1000 people per year, and the mortality rate ranges from 100 to 180 cases per 100 thousand people, and disability is 104.6 per 100,000 population [1].

Over the past decade, a number of programs and a road map have been introduced to improve the provision of medical care for diseases of the circulatory system, stroke, and injuries in the Republic of Kazakhstan for 2022-2023 [10]. In addition, new treatment methods have been introduced in the regions, as well as high-tech medical services to reduce deaths from heart disease, including stroke and other.

The purpose of our study is to analyze cases of hospitalization of patients with acute cerebrovascular accidents from 2012 to 2022 in Almaty city.

Materials and Methods

This was a retrospective observational study based on data obtained from the National Scientific Center for Health Development in Almaty, Republic of Kazakhstan. The institution's management was informed of the study's progress and raised no objections regarding the publication of the findings in open-access sources. Cases were analyzed according to International Disease Classification Code 10 (ICD-10):

- I 60.0- I 60.9 (Subarachnoid haemorrhage);
- I 61.0-I 61.9 (Intracerebral haemorrhage);
- I 63.0-I 63.9 (Cerebral infarction);
- I69.0 - I69.4 and I69.8 (Sequelae of cerebrovascular disease);
- I70.0- I70.2 and I70.8, I 70.9 (Atherosclerosis);
- I78.0- I78.1 and I78.8 (Diseases of capillaries).

The data analysis period was 10 years, from 2012 to 2022. The analysis data included the age of the patients, the days spent in bed, and the outcome of the disease. The analysis also included data from emergency or planned admissions. Data analysis was carried out using the SPSS 13 program.

The study was approved by local ethics committee of the Kazakh National Medical University (№ 4, 140. 03-05-2023)

Results

Our analysis showed that the age of patients with acute cerebrovascular accidents fluctuated within 10 years in the range of 54.49 years and 61.97 years (table 1). In general, it is worth noting that the number of patients in this nosology group grew from 2012 to 2017 from 63 cases to 269, after which there was a sharp decrease until 2020 (89 patients), and then it increased to 191 cases in 2022. Over the course of ten years, the average bed days of hospitalized cases was 11.46 days.

Cases of emergency hospitalization of patients with this category of nosology are higher than planned ones, which is due to the specifics of the disease. Nevertheless, there is a positive trend in reducing emergency hospitalization cases from 95.2 in 2012 to 53.9 in 2022. The peak increase in cases of urgent hospitalization was 99.4 in 2019 (figure 1). However, the largest number of days is observed in 2014 and 2019 (table 1).

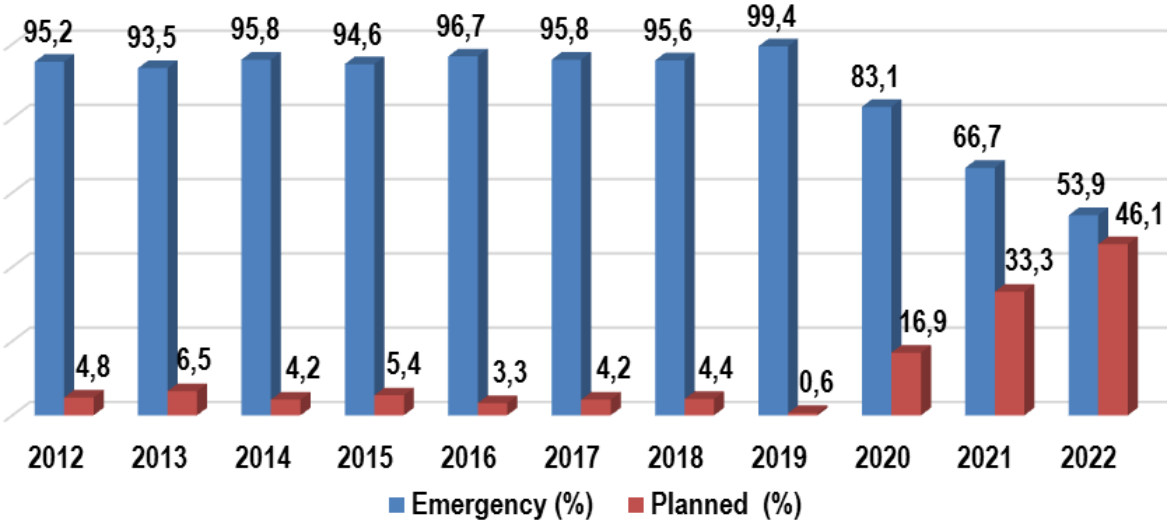

Figure 1. Type of hospitalization from 2012 to 2022.

Table 1.

Characteristics of patients with acute cerebrovascular accidents.

Years	N	Age of patients	Bed days spent
		Mean± Std. Deviation	Mean± Std. Deviation
2012	63	54.49±25.01	10.21±9.76
2013	124	50.24±24.52	10.88±10.26
2014	142	60.20±15.38	14.09±31.66
2015	185	58.79±16.73	12.85±12.64
2016	269	61.07±14.86	11.37±8.93
2017	262	61.40±15.00	10.72±8.39
2018	251	61.49±15.07	11.90±8.30
2019	179	61.97±15.48	12.79±13.1
2020	89	63.34±13.29	8.63±6.95
2021	108	57.67±20.11	10.59±6.87
2022	191	59.73±13.88	10.09±6.47
Total	1863	59.80±16.84	11.46±12.64

Treatment outcome was taken into four categories as death; recovery; no change; and deterioration. The mortality rate was high in 2012 and 2013, but subsequently the dynamics changed to decrease until 2020. The decline was from 50.8% to 15.3% between 2012 and 2017, followed by an increase in 2020 to 27.0%, then a decrease to 14.7% by 2022 (table 2). Regarding recovery cases, the indicator has changed in a positive direction. Patients who were cured in 2012 and 2013 were about 46.0%. However, by 2022 this figure increased to 80.6%. However, there were less downturns between 2019 and 2020 (table 2).

There are cases when the patient's condition remains unchanged. This indicator varied between 3.2% and 6.7%. However, in 2014, 2017, 2019, the rate was above average and amounted to 7.7%, 15.6% and 10.0%, respectively (table 2). Deterioration was identified in few cases in 2013 – 1.6% as well as in 2017 – 0.4%.

Since the city of Almaty is a metropolis where medical organizations of the republican level are located, patients from other cities are accordingly observed. Thus, in dynamics we see that compared to 2012, the number of nonresident patients decreased from 31.4% to 17.5%, where the peak of the decrease was 8.1% in 2015 (figure 2). This decrease is associated with the development of high-tech services and stroke care programs in the country, within the framework of which regional-level hospitals began to introduce the latest treatment methods and technologies.

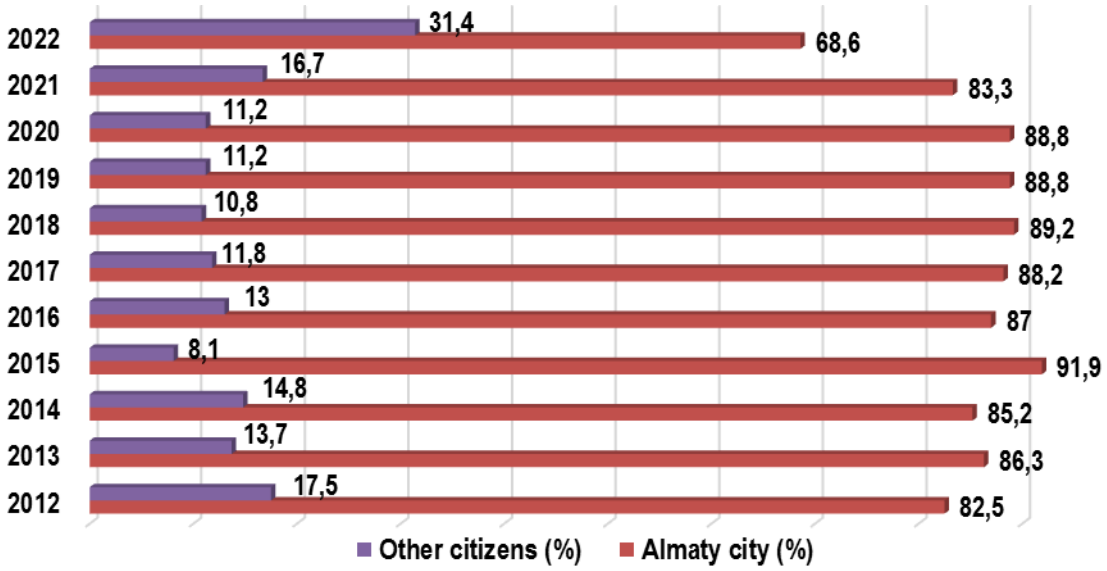

Figure 2. Hospitalization of residents of Almaty and non-residents.

Table 2.

Treatment outcome in four categories during 2012 to 2022.

Years	Death		Recovery		No change		Deterioration	
	N	%	N	%	N	%	N	%
2012	32	**50.8**	29	46.0	2	3.2	0	
2013	63	**50.8**	58	46.8	1	0.8	2	1.6
2014	41	28.9	90	63.4	11	7.7		
2015	50	27.0	129	69.7	6	3.2		
2016	62	23.0	192	71.4	15	5.6		
2017	40	15.3	180	68.7	41	15.6	1	0.4
2018	47	18.7	189	75.3	15	6.0		
2019	38	21.2	123	68.7	18	10.1		
2020	24	27.0	59	66.3	6	6.7		
2021	22	20.4	81	75.0	5	4.6		
2022	28	14.7	154	80.6	9	4.7		

Discussion

Assessing and monitoring the country's socio-demographic indicators is a necessary procedure when planning medical expenses for the quality provision of planned and emergency care for acute cerebrovascular accidents. Overall, the studies show that average hospital stays were about 10 days, which is consistent with our data. It is also noted that women have a lower number of days compared to men [9,21]. Stroke can affect people of any age, although it has traditionally been perceived as a disease of older people, with incidence doubling every ten years after age 55 [15]. In recent years, the average age of stroke patients has been decreasing, and the incidence of strokes and hospitalizations among young people has been increasing worldwide [6,7]. *Octavian Păun co-authors* note that most often stroke occurs in people over 50 years of age. Our study also found that patients were hospitalized at this age [11].

Mortality rates were high in 2020, most likely due to the Covid-19. Research confirms the negative impact of Covid-19 on the condition of patients with stroke and cerebrovascular diseases, which are a risk factor for the deterioration of the health [3,5,19].

The idea of risk factors today is scientifically substantiated and is based on assessing the likelihood of developing acute cerebrovascular accidents depending on clinical, biochemical, and many other characteristics, including the environment. It was found that often the first symptoms of a stroke, headache, are often overlooked, and therefore there is a risk of emergency hospitalization. In our study, the proportion of emergency hospitalization is still higher than planned; accordingly, measures are required to improve the knowledge of medical specialists on the symptoms of this nosology, for timely detection and diagnosis, and therefore the provision of assistance [12]. In a study of two million adults discharged from the emergency department with a primary diagnosis of headache, 0.5% were hospitalized for a major neurological disorder such as cerebral infarction (18%) and transient ischemic attack (12%) [8].

Secondary complications after intracerebral hemorrhage (ICH) can worsen outcome and are associated with early death. Of 10.029 patients with spontaneous intracerebral hemorrhage, the cumulative incidence of secondary complications was 39.9% of which were pneumonia (15.1%), cerebral edema (6.5%), cardiac decompensation (5.9%), urogenital infection (5.5%), hydrocephalus (4.6%), epilepsy (3.4%) and rebleeding (3.4%) [17]. In the future, it is necessary to study the frequency of complications that possibly lead to

deterioration of the condition; in particular, for our study, the years in which the rate of deterioration was the highest would be relevant.

Conclusion

Prevention and treatment still need to be continually improved, taking into account age, gender, and risk factors and other factors. The introduction of stroke programs, as well as improvements in primary health care, has allowed us to improve care for patients with acute cerebrovascular accidents, but targeted strategies must be gradually developed in the future.

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Literature:

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