Clinical And Statistical Characteristics Of Patients With Cerebral Stroke

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***Abstract:** A retrospective analysis of 139 case histories of patients admitted to the Multidisciplinary Medical Center of Bukhara with a diagnosis of "Acute cerebrovascular accident" from 2009 to 2019 was carried out. As a result of the study, it was revealed that in the structure of hospitalizations, the largest number of patients with cerebral stroke (CS) lived in rural areas, and among them women predominated. The ratio of ischemic and hemorrhagic strokes in the city of Bukhara and the Bukhara region was 4.9: 1. Among the patients with both IS and HS, females predominated. The totality of the revealed indicators, depending on the hemispheric lateralization of the focus, showed that the overall severity of the neurological and functional defect according to the NIHSS, Gusev-Skvortsova and Bartel scales reliably predominates in the case of right-sided localization of the focus worse compared to male patients.*

***Keywords:** vascular pathology, neuropsychological, morpho – functional, hemispheric lateralization, cerebrovascular diseases.*

1. INTRODUCTION

Cerebrovascular diseases (CVD) are among the leading causes of death and disability in the population. Older people is the most significant risk factor for stroke. The risk of stroke morbidity doubles every ten years of life after 55 years of age [2,3,5].

Stroke is a serious source of financial burden around the world. According to the WHO, the total amount of direct and indirect costs per stroke patient is 55-73 thousand US dollars per year, and the annual loss of years of full life due to disability after a stroke in the world is 20.3 million person-years among men and 22.9 million person-years for women (3).

Vascular pathology of the brain is the most common form of damage, determined by the fact that in this case, general cerebral factors are less pronounced. Therefore, the vascular model, as shown by many literary sources (1,4,8), is the most adequate for multivariate neuropsychological studies, especially in relation to the results of clinical, neuropsychological diagnostics, in relation to the results of clinical, neuroimaging and other types of objective research in real clinical practice. However, many problems of verifying morpho - functional foci of vascular lesions and identifying intact functional systems of speech, gnosis, praxis, etc. remain insufficiently studied. It should also be added, an assessment of the role and influence of nonspecific activating brain structures on the functioning of brain in a hemispheric defect, as well as an assessment of the criteria for the dynamism or resistance of brain recovery (in the overall picture of the disease) in left-right hemispheric stroke during rehabilitation (9, 10).

All this aims to search for reserves aimed at optimizing the provision of medical care to patients with vascular diseases of the brain, which is the purpose of the study: to conduct a retrospective clinical and statistical characterization of patients with cerebral stroke (CS) according to the case histories of patients with CS of the Multidisciplinary Medical Center of the city Bukhara for a period of 10 years (2009-2019).

2. MATERIAL AND METHODS

A retrospective analysis of 1354 case histories of patients admitted to the multidisciplinary medical Center of Bukhara with a diagnosis of acute cerebrovascular accident in 2009-2019 was carried out.When analyzing the case histories, the annual prevalence, structure of CS, clinical manifestations depending on the localization of the lesion, outcomes, as well as the sex and age of the patients were studied.

The inclusion criteria for the study were patients with diagnoses corresponding to codes I60 – I64 of ICD-10. The structure of patients was considered by us according to the pathogenetic type of stroke:

1) ischemic stroke caused by acute focal cerebral ischemia, leading to an infarction (zone of ischemic necrosis) of the brain (cerebral infarction, I63.0-9);

2) hemorrhagic stroke caused by rupture of an intracerebral vessel and penetration of blood into the brain parenchyma or rupture of an arterial aneurysm with subarachnoid hemorrhage (non-traumatic intracerebral hemorrhage (I61.0-9) and subarachnoid hemorrhage (I60.0-9)).

The diagnosis of cerebral stroke (CS) was verified by the results of magnetic resonance imaging and / or computed tomography of the brain. Assessment of the neurological status included determination of the degree of impairment of consciousness, the severity of impairments to motor and sensory functions, statodynamic, coordinating and cognitive impairments. Our study analyzed neurological status data and indicators of clinical rating scales: NIHSS - to identify the severity of stroke, Gusev and Skvortsova - to determine the severity of neurological disorders; Bartela - to assess the state of functional daily life (6).

Statistical processing of the results was carried out using the software package "Microsoft Excel" and "Statistica 7.0" for "Windows". Quantitative data are presented as arithmetic mean (M), representativeness error (m), relative frequencies. The significance of the differences in mean values was determined using the Student's test (t). For comparison by a qualitative binary criterion, the $\chi2$ criterion was applied, to compare the percentages, the angular Fisher transformation (φ-transformation) was used. The correlation dependence was determined using the Spearman nonparametric test (ρ).

3. RESULTS AND DISCUSSION

In the multidisciplinary medical Center of the city of Bukhara during 2009–2019. 1354 cases of cerebral stroke (CS) were registered. Of these, 42.9% are men and 52.1% of cases are revealed among women. In the city, 608 cases of CS (44.9%) were recorded, of which 21.9% in men and 49.6% in women (Table 1). 746 (55.1%) cases of CS were received from the Bukhara region, 38.1% of them in men and 61.9% in women. As can be seen from the data presented, the largest number of CS occurred in the Bukhara region, and the largest number of strokes occurred among women in all groups. There are significant differences in CS indicators in women in rural areas and in women among all studied patients.
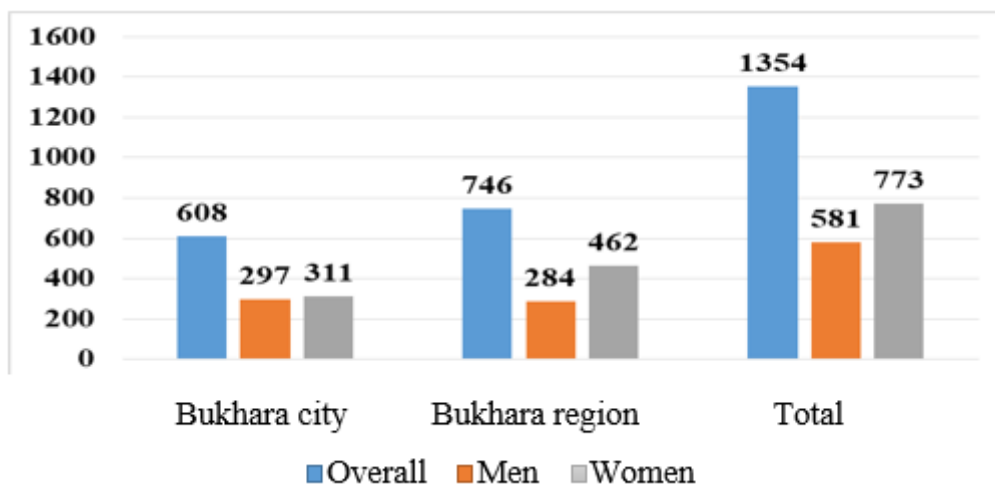
Table 1.

The number of cases of cerebral stroke in Bukhara city and Bukhara region

Total	abs	1354	581	773
	%	100.0	42.9	57.1 *
Bukhara city	abs	608	297	311
	%	44.9	48.8	51.2
Bukhara region	abs	746	284	462

	%	55.1 #	38.1	61.9**

*- reliability of the difference between , p < 0,05

**-*- reliability of difference, p < 0,01

✦- reliability of the difference between , p < 0,05

★ -reliability of difference, p < 0,01

Diagram 1. The number of cases of cerebral stroke in Bukhara city and Bukhara region

Starting from the age group of 25-44 years, on average, there is a gradual increase in the number of strokes with age for both men and women (Table 2). The largest number of strokes occurs in the 60-75 age group. At the same time, the number of CS among women is higher in the age groups 44-60 years old and 60-75 years old. But in the age group 25-44, CS is more common in men than in women - in 5.0%, versus 2.3%, respectively. This pattern can be traced both in IS and HS. Statistical data in this age category are consistent with both the average Russian and international research data . And in the age groups 44-60 years old and 60-75 years old in our study, there is a significantly higher percentage of women both in the CS category and in patients with IS and HS.

The largest number of cases of cerebral strokes occurs in ischemic stroke. For the period 2009–2019 the share of ischemic strokes was 83.3% (diagram 2), which is higher than the average in Russia (80.7%).

Table 2.

Total number of stroke cases among men and women by age and depending on the type of CS

	Age, years		**25-44**	**44-60**	**60-75**	**Total**
ICH n=1354	Men	abs	29	238	314	581
		%	5.0	41.0	54.0	42.9
	Women	abs	18	212	543	773
		%	2.3*	27.4*	70.2*	57.1*
HS n=226 16,7%	Men	abs	17	49	26	92
		%	18.5	53.3	28.3	40.7
	Women	abs	14	46	74	134
		%	10.4*	34.3*	55.2*	59.3*
IS n=1128	Men	abs	5	223	261	489
		%	1.0	45.6	53.4	43.4

83,3%	Women	abs	2	198	439	639
		%	0.3	31.0*	68.7*	56.6*

*- reliability of differences between men and women within groups,
p < 0,05

The share of hemorrhagic stroke, including intracerebral hemorrhages and subarachnoid hemorrhages, accounted for 16.7%, which is higher than the national average (13.5%). Thus, the ratio of ischemic and hemorrhagic strokes in the city of Bukhara and the Bukhara region was 4.9: 1, while the same indicator for the same period on average in Russia was 5.0: 1.
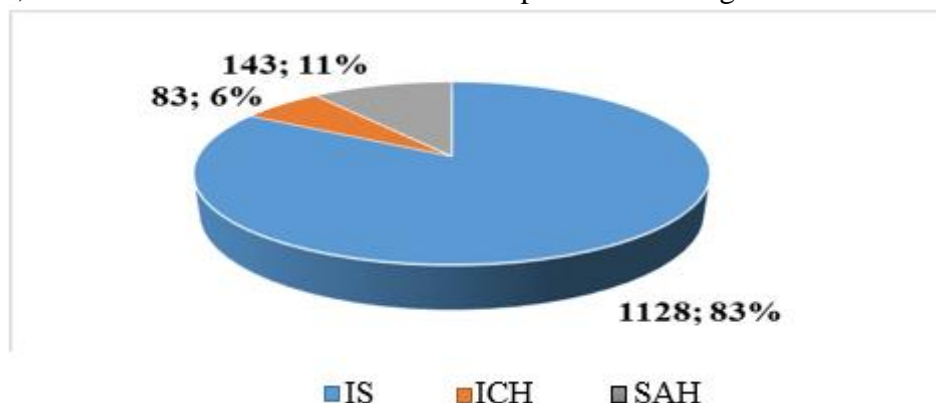

Diagram 2. Percentage ratio of different types of cerebral stroke

The high percentage of hemorrhagic stroke is probably associated with a poorly adjusted system for correcting arterial hypertension in residents of the Bukhara region. Table 3 also shows that the proportion of intracerebral hemorrhages among hemorrhagic strokes is lower than the proportion of SAH - 6.1% versus 10.6%, respectively. It should also be noted that females prevail among patients with both IS and HS. As for the average age, it can be seen from Table 3 that in patients with SAH this indicator is lower than in patients with ICH and IS - 61.8 + 5.7; 64 + 5.3 and 66.8 + 5.2 years, respectively.

Table 3.
The number of CS cases among men and women,types of CS stroke and average age of patients

CS	sex	number of patients	% of all cases IS	Average age (M$\pm$m)
IS	Men	489	36.1	65.3$\pm$6.9
	Women	639	47.2	68.3$\pm$3.4
	Total	1128	83.3	66.8$\pm$5.2
ICH	Men	33	2.4	62.8$\pm$4.8
	Women	50	3.7	65.9$\pm$2.7
	Total	83	6.1	64$\pm$5.3
SAH	Men	59	4.4	58.8$\pm$6.1
	Women	84	6.2	64.7$\pm$4.5
	Total	143	10.6	61.8$\pm$5.7

Note:ICH intracerebral hemorrhage

SAH subarachnoid hemorrhage

As you can see from the table 4, in all patients with IS in the most acute period, according to the NIHSS scale, severe stroke was detected, according to the Gusev-Skvortsova scale - moderately expressed neurological disorders, according to the Bartel scale - moderate

disability in functional daily life. Moreover, it should be noted that in females with all forms of IS, the indicators are worse than in males.

Note: RH-right hemispheric, LH-left hemispheric, IS — ischemic stroke, VBB-vertebrobasillar, * - significance of the difference between patients with RH and LH, p <0.05.

- significance of the difference between patients with RH, LH and VBB, p <0.05.

IS, n=1158	Sex	number of patients	% of all cases of IS	NIHSS scale (points)	Gusev-Skvortsova scale	Bartel Index
carotid - LH 47,2%	Men	234	20.7	15.3+5.8*#	29.8+6.1*	58.9±11.9
	Women	298	26.4	14.8+6.2*#	28.9+7.3*	57.7±8.7*#
	Total	532	47.2	15.1 ± 7.5*	29.3 ± 9.5*#	58.6 ± 5.9*#
carotid -RH 37,4%	Men	186	16.5	16+5.6	30.1+6.3	58.6±12.1
	Women	236	20.9	14.9+3.2	27.6±6.1	52.4±9.5
	Total	422	37.4	15.8+9.4	28.7±4.9	56.3±11.8
VBB 15,4%	Men	69	6.1	15.8+4.4	29.4+6.8	57.8±9.3
	Women	105	9.3	15.6+8.2	28.2±7.9	53.3±13.1
	Total	174	15.4	15.4+5.1	28.6±5.2	55.8±10.7

The totality of the revealed indicators, depending on the hemispheric lateralization of the focus, showed that the overall severity of the neurological and functional defect according to the scaled scales significantly prevails in the case of right-sided localization of the focus. The Bartel index was significantly higher in the group of patients with lesions of the left hemisphere (Table 4).

Thus, the results of our research show that in the structure of hospitalizations, the largest number of patients with CS lived in rural areas, and among them women predominated. The ratio of ischemic and hemorrhagic strokes in the city of Bukhara and the Bukhara region was 4.9: 1. Among the patients with both IS and HS, females predominated. The totality of the identified indicators, depending on the hemispheric lateralization of the focus, showed that the overall severity of the neurological and functional defect according to the NIHSS, Gusev-Skvortsova and Bartel scales reliably predominates in the case of right-sided localization of the focus. worse compared to male patients.

4. CONCLUSION

So, the results of our studies allow us to reflect the features of clinical neurological manifestations in patients in the acute period of CS. The results obtained should be used in the development of specific rehabilitation programs in the acute and acute periods of IS, taking into account the lateralization of the lesion focus.The totality of the revealed indicators, depending on the hemispheric lateralization of the focus, showed that the overall severity of the neurological and functional defect according to the scaled scales significantly prevails in the case of right-sided localization of the focus.

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