Predictors of Hospital Mortality in Patients with Atrial Fibrillation and Stroke

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Abstract: Atrial fibrillation is one of the most common cardiac arrhythmias; it accounts for about a third of all hospital admissions for cardiac arrhythmias. Currently, there is a tendency of aging of the population and an increase in overall life expectancy, which will further lead to an increase in the number of patients with atrial fibrillation.

Usually atrial fibrillation is associated with a number of symptoms such as palpitations, interruptions, shortness of breath, pain in the heart area, fatigue, dizziness and syncopal states, but at the same time the course of both paroxysmal and permanent atrial fibrillation may not be accompanied by obvious symptoms or a noticeable decrease in quality life. Such asymptomatic atrial fibrillation is usually diagnosed by chance during an examination and can be considered a clinical finding. According to a number of studies, every third to fifth patient with atrial fibrillation was asymptomatic, and in a recently completed study in patients with paroxysmal atrial fibrillation, more than 50% of all episodes of arrhythmia were asymptomatic. When newly diagnosed atrial fibrillation, the asymptomatic form may occur in 83.2% of cases [1].

The purpose of the research is on the basis of studying the clinical features of the course of atrial fibrillation, determine the effect of asymptomatic arrhythmia on the development of fatal complications and patient survival in various forms of atrial fibrillation and develop a therapeutic strategy for managing patients with asymptomatic atrial fibrillation for the first time.

Keywords: Predictors, hospital mortality, patients, atrial fibrillation, stroke.

INTRODUCTION

Stroke is a serious public health problem, ranking second among causes of death and disability in the world [1]. In the structure of strokes, ischemic strokes account for 85%, hemorrhagic — 15%. 30% among all ischemic strokes are cardioembolic strokes, characterized by a more severe course and a worse prognosis. The main risk factors for cardioembolic strokes are atrial fibrillation (FP), valvular heart disease, cardiomyopathy, coronary heart disease and cardiac surgery [2]. According to Luiz Carlos Porcello Marrone *et al*. First place among all causes of cardioemoletic stroke is FP-50.7% of cases [3]. Strokes occurring against the background of AF have a more unfavorable prognosis [4], an increased risk of subsequent disability and mortality [5-7].

The aim of our study was to evaluate hospital mortality in patients with ischemic / hemorrhagic stroke and concomitant AF, and also to determine which risk factors affect this indicator [2].

MATERIALS AND METHODS

The data were obtained by retrospective analysis of the database of discharged patients of the stroke center of Almaty. The sample was conducted among patients who were hospitalized from January 2013 to December 2015 with a diagnosis of ischemic stroke, hemorrhagic stroke, and transient ischemic attack. Of 7921 patients, 849 patients with stroke / TIA and concomitant atrial fibrillation were selected. When analyzing in-hospital mortality, 116 patients with TIA were excluded from the analysis due to the absence of deaths in this category of patients. We studied demographic data, major comorbidities (ischemic heart disease, chronic heart failure, arterial hypertension, diabetes mellitus, myocardial infarction and a history of stroke, chronic rheumatic heart disease, thyroid disease, hepatic and renal failure), taking drugs before hospitalization (including antiplatelet agents and anticoagulants). Statistical processing was performed using IBM-SPSS.22, the analysis data are presented as means and percentages. A comparative analysis was carried out using the calculation of χ-2 statistics and the Fisher test [3].

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Table 1: Demographic Characteristics of the Studied Population

	Ischemic stroke, n (%)	Hemorrhagic stroke, n (%)	p-value
Floor			0.733
women	392 (61.3)	60 (63.8)	
men	247 (38.7)	34 (36.2)	
Age, average	72.2±10.6	70.9±11.5	0.31
<50	18 (2.8)	3 (3.2)	
50-59	51 (8.0)	14 (14.9)	
60-69	178(27.9)	26 (27.7)	
70-79	238 (37.3)	27 (28.7)	
80+	153 (24)	24 (25.5)	
Nationality			0.529
Kazakhs	213 (33.3)	28 (29.8)	
Russians	370 (57.9)	61 (64.9)	
another asian	37 (5.8)	3 (3.2)	
other european	19 (3)	2 (2.1)	

RESULTS

A total of 733 patients with AF were selected, of which 639 (87.2%) with ischemic stroke and 94 (12.8%) with hemorrhagic stroke. According to the type of AF among patients with ischemic and hemorrhagic stroke, the majority of patients had a permanent form of AF (96.1% and 96.8%, respectively), only a small number of patients had paroxysmal AF (3.9% and 3.2%, respectively).

When analyzing the basic demographic data, there were no statistically significant differences between the groups of patients with ischemic and hemorrhagic strokes. In both groups there were more women (61.3% and 63.8%) than men (38.7% and 36.2%). The average age in both groups was about 70 years, the largest number of patients were represented in the age groups 60-69 years (27.9% and 27.7%), 70-79 years (37.3% and 28.7%) and over 80 years old (24% and 25.5%). The main group of patients consisted of Russians (57.9% and 64.9) and Kazakhs (33.3% and 29.8%) (Table **1**).

The most frequent comorbidities among patients with ischemic and hemorrhagic strokes were arterial hypertension (92% and 91.5%), IHD (90% and 87.2%), CHF (94.1% and 92.6%), diabetes mellitus Type 2 (21.3% and 21.3%), previous myocardial infarction (21.95 and 21.3%) and stroke (37.9% and 34%). A small percentage of patients in both groups had cancer (2.3% and 3.2%). Also in the group of patients with ischemic stroke, 3.1% of patients had a history of peripheral thrombosis. It is worth noting that in more than 60% of patients with acute cerebral blood circulation there was a decrease in the glomerular filtration rate (GFR), an increase in the level of transaminases was observed in a third of patients — ALT (12.9% and 17%) and AST (8.6% and 16%) (Table **2**) [4].

All patients underwent stratification of the risk of developing strokes according to the CHA2DS2_VASc scale and the risk of developing severe bleeding on the HAS_BLED scale at the time of hospitalization, while the development of this stroke was not taken into account when calculating points. As a result, 94.5% of patients with ischemic stroke and 91.5% of patients with hemorrhagic stroke scored 2 or more points on the CHA2DS2_VASc scale, that is, they had direct indications for taking oral anticoagulants before hospitalization. At the same time, only 2.7% of patients with ischemic stroke and 5.3% with hemorrhagic stroke had a high risk of developing serious bleeding — more than 3 points on the HAS_BLED scale. Thus, more than 90% of patients prior to hospitalization were to receive oral anticoagulants, however, in reality, about 12% of patients in both groups took antiplatelet agents as prevention of thromboembolic complications and only 4.7% of patients with ischemic stroke and 3.2% of patients with hemorrhagic stroke took oral anticoagulants. Among other essential drugs, beta-blockers (10.5% among patients with ischemic stroke and 8.5% of patients with hemorrhagic stroke) and ACE inhibitors (12.5% with ischemic stroke and 4.3%

Table 2: Main Concomitant Diseases and Clinical Characteristics of Patients

	Ischemic stroke, n (%)	Hemorrhagic stroke, n (%)	p-value
Myocardial infarction	140 (21.9)	20 (21.3)	0.89
Previous stroke	242 (37.9)	32 (34)	0.496
CHF (NYHA FC)			0.513
no CHF	38 (5.9)	7 (7.4)	
I	24 (3.8)	1 (1.1)	
II	391 (61.2)	56 (59.6)	
III/IV	186 (29.1)	30 (31.9)	
Ischemic heart disease	575 (90)	82 (87.2)	0.467
Arterial hypertension (degree)			0.997
not	51 (8)	8 (8.5)	
the first	7 (1.1)	1 (1.1)	
the second	64 (10)	9 (9.6)	
the third	517 (80.9)	76 (80.9)	
Type 2 diabetes	136 (21.3)	20 (21.3)	0.999
A history of peripheral arterial thrombosis	20 (3.1)	0 (0)	0.095
ChKV in the anamnesis	15 (2.3)	0 (0)	0.239
Implantation of EX in history	8 (3.1)	8 (3.1)	0.605
History of CABG	10 (1.6)	4 (4.3)	0.092
Oncological diseases	15 (2.3)	3 (3.2)	0.494
SCF			0.27
≥90	228 (39.2)	28 (32.9)	
60-89	234 (40.3)	34 (40)	
30-59	108 (18.6)	19 (22.4)	
<30	11 (1.9)	4 (4.7)	
AST level			0.036
<40	584 (91.4)	79 (84)	
≥40	55 (8.6)	15 (16)	
ALT level			0.26
<40	555 (87.1)	78 (83)	
≥40	82 (12.9)	16 (17)	

FC-functional class, NYHA-New York Heart Association (NYHA) Functional Classification, PCI-percutaneous coronary intervention, EX-pacemaker, AKSH-coronary artery bypass surgery, SCF-glomerular filtration rate, ALT-alanine aminotransferase, AST-aspartate aminotransferase.

with hemorrhagic stroke) are worth noting. , p = 0.015) (Table **3**) [5].

Hospital mortality in the group with ischemic strokes was 14.24% (91 patients), in the group with hemorrhagic strokes, 45.7% (43 patients).

In the future, we analyzed the main factors that could affect hospital mortality in patients with stroke and concomitant AF.

When analyzing the hospital mortality of patients with ischemic stroke (Table **4**) and concomitant AF, there was no statistically significant difference among patients depending on gender, age, and nationality. Regarding the type of AF, it is difficult to draw conclusions of sufficiency due to the small number of patients with paroxysmal AF, which is associated with the difficulties of verifying this pathology. A history of stroke and myocardial infarction also did not affect

Table 3: Risk Stratification and Major Groups of Preparations Before Hospitalization

	Ischemic stroke, n (%)	Hemorrhagic stroke, n (%)	p-value
HAS_BLED			0.186
≥3	17 (2.7)	5 (5.3)	
<3	622 (97.3)	89 (94.7)	
CHA2DS2_VASc			0.439
0	5 (0.8)	1 (1.1)	
1	30 (4.7)	7 (7.4)	
2+	604 (94.5)	86 (91.5)	
Anticoagulants	30 (4,7)	3 (3,2)	0.648
Antiplatelet	79 (12,4)	12 (12,8)	0.923
ACE Inhibitors	80 (12.5)	4 (4.3)	0.015
β-blockers	67 (10.5)	8 (8.5)	0.715
Amiodarone	9 (1.4)	0 (0)	0.613
Digoxin	10 (1.6)	4 (4.3)	0.092

APP-angiotensin-converting enzyme.

hospital mortality in patients with ischemic stroke (OR 0.78, 95% CI: 0.49–1.25, p = 0.36 and OR 1.62, 95% CI: 0.99–2.67, p = 0.08, respectively) [6].

If we consider the effect of concomitant cardiovascular diseases on the hospital mortality of this category of patients, we found a statistically significant association for severe CHF (NYHA FC III and IV FC) (OR 5.25, 95% CI: 1.21-22.7, p = 0.016), diabetes mellitus Type 2 (OR 1.93, 95% CI: 1.18-3.14, p = 0.014), a history of peripheral vascular thrombosis (OR 3.42, 95% CI: 1.33-8.84, p = 0.03) and PCI in the past (OR 4.2, 95% CI: 1.47-12.8, p = 0.024). The dependences obtained are presumably due to the fact that the above-mentioned conditions significantly aggravate the severity of the patients. At the same time, concomitant arterial hypertension, ischemic heart disease and CABG in history did not affect mortality, relatively CABG result is doubtful due to the small number of patients.

In patients with cancer, hospital mortality was higher (OR 3.13, 95% CI: 1.04-9.38, p = 0.098), which presumably was related to the severity of this category of patients [7].

There were no fatal cases among patients who had previously taken anticoagulants (warfarin and rivaroxaban), although the result is not entirely reliable due to the small number of patients (p = 0.024 and 0.89, respectively). No statistically significant effect of taking other drugs on mortality was found.

There was a link between reduced renal function and hospital mortality — in all subgroups of reduced GFR, regardless of the degree of decline, there was a higher mortality rate than in individuals with normal levels of GFR. In the subgroup with SCF 60-89 μmol / L and 30-89 μmol / L almost 2 times (OR 2.17, 95% CI: 1.25-3.75, p = 0.0069 and OR 1.99, 95% CI: 1.03-3.88, p = 0.06), in the subgroup with SCF less than 30 μmol / l more than 3 times (OR 5.35, 95% CI: 1.45-19.7, p = 0.04). A similar dependence is observed in subgroups with elevated levels of ALT and AST (OR 2.02, 95% CI: 1.15-3.58, p = 0.028 and OR 2.5, 95% CI: 1.3-4.76, p = 0.01).

After calculating the adjusted (adjusted) indicators, the statistical significant association of hospital mortality was preserved relative to type 2 diabetes mellitus (OR 1.83, 95% CI: 1.03–3.23, p = 0.039), peripheral vascular thrombosis (OR 3.44, 95% CI: 1.18– 10.04, p = 0.024), a PCI of a history (OR 4.74, 95% CI: 1.3-17.28, p = 0.018), a decrease in GFR (p = 0.043) and an increased level of ALT (OR 0.38, 95% CI: 0.16-0.93, p = 0.03) (Table **5**) [8].

The analysis of hospital mortality in patients with hemorrhagic stroke and concomitant AF did not reveal a statistically significant association with any of the possible risk factors, i.e. Neither demographic nor clinical factors in our study had a significant effect on mortality (Table **6**).

Table 4: Effect of Various Factors on Hospital Mortality in Patients with Ischemic Stroke

Risk factor	Total, n (%)	Hospital mortality, n (%)		OR, 95% CI	p
Floor		Yes	Not		
women	392 (61.3)	56 (14,3)	336 (85.7)	1.01 (0.64-1.59)	0.361
men	247 (38.7)	35 (14.2)	212 (83,4)		
Age groups					
<50	18 (2.8)	3 (16.7)	15 (83.3)	0.98 (0.3-3,6)	>0.99
50-59	51 (8.0)	5 (9.8)	46 (90.2)	0.53 (0.19-1.4)	0.31
60-69	178(27.9)	25 (14)	153 (86)	0.8 (0.4-1.4)	0.5
70-79	238 (37.3)	32 (13.4)	206 (86.6)	0.76 (0.4-1.3)	0.4
80+	153 (24)	26 (17)	127 (83)		
Nationality					
Kazakhs	213 (33.3)	29 (13.6)	184 (86.4)		
Russians	370 (57.9)	54 (14.6)	316 (85.4)	1.1 (0.7-1.8)	0.74
another asian	37 (5.8)	3 (8.1)	34 (91.9)	0.6 (0.2-2)	0.57
other european	19 (3)	5 (26.3)	14 (73.7)	2.35 (0.6-7.6)	0.23
Type of OP					
constant	614 (96.1)	90 (14.7)	524 (85.3)		0.21
paroxysmal	25 (3.9)	1 (4.0)	24 (96)	0.24 (0.03-1.81)	
History of myocardial infarction					
Not	499 (78.1)	64 (12.8)	435 (87.2)		
Yes	140 (21.9)	27 (19.3)	113 (80.7)	1.62 (0.99-2.67)	0.08
History of stroke					
Not	397 (62.1)	61(15.4)	336 (84.6)		
Yes	242 (37.9)	30 (12.4)	212 (87.6)	0.78(0.49-1.25)	0.36
CHF (NYHA FC)					
no CHF	38 (5.9)	2 (5.3)	36 (94.7)		
I	24 (3.8)	0 (0)	24 (100.0)		0.74
II	391 (61.2)	47 (12.0)	344 (88.0)	2.46 (0.57-10.5)	0.33
III/IV	186 (29.1)	42 (22.6)	144 (77.4)	5.25 (1.21-22.7)	0.016
Ischemic heart disease					
Not	64 (10)	6 (9.4)	58 (90.6)		
Yes	575 (90)	85 (14.8)	490 (85.2)	1.67 (0.7-4.0)	0.32
Arterial hypertension (degree)					
Not	51 (8)	6 (11.8)	45 (88.2)		
first degree	7 (1.1)	1(14.3)	6 (85.7)	1.25 (0.13-12.2)	>0.99
second degree	64 (10)	5 (7.8)	59 (92.2)	0.64 (0.18-2.2)	0,69
third degree	517 (80.9)	79 (15.3)	438 (84.7)	1.35 (0.56-3.28)	0.66
Diabetes					
Not	503 (78.8)	62 (12.3)	441 (87.7)		
Yes	136 (21.3)	29 (21.3)	107 (78.7)	1.93 (1.18-3.14)	0.014
Thrombosis of peripheral vessels in histo					
Not	619 (96.6)	84 (13.6)	535 (86.4)		
Yes	20 (3.1)	7 (35)	13 (65)	3.42 (1.33-8.84)	0.03

(Table 4). Continued.

Risk factor	Total, n (%)	Hospital mortality, n (%)		OR, 95% CI	p
Floor		**Yes**	**Not**		
History of PCI					
Not	624 (97.7)	85 (13.6)	539 (86.4)		
Yes	15 (2.3)	6 (40)	9 (60)	4.2 (1.47-12.8)	0.024
History of CABG					
Not	629 (98.4)	88 (14)	541 (86)		
Yes	10 (1.6)	3 (30)	7 (70)	2.6 (0.66-1.25)	0.32
Oncological diseases					
Not	624 (97.7)	86 (13.8)	538 (86.2)		
Yes	15 (2.3)	5 (33.3)	10 (66.7)	3.13 (1.04-9.38)	0.098
HAS_BLED					
≥3	17 (2.7)	3 (17.6)	14 (82.4)	1.3 (0.37-4.6)	0.89
<3	622 (97.3)	88 (14.1)	534 (85.9)		
CHA2DS2_VASc					
0	5 (0.8)	0 (0)	5 (100.0)		
1	30 (4.7)	1 (3.3)	29 (96.7)	1	
2+	604 (94.5)	90 (14.9)	514 (85.1)	5.08 (0.68-37.7)	0.11
Acceptance of anticoagulants before hospitalization					
Not	609 (95.3)	91 (14.9)	518 (85.1)		
warfarin	25 (3.9)	0 (0)	25 (100)		0.038
rivaroxaban	5 (0.8)	0 (0)	5 (100)		0.89
β-blockers before hospitalization					
Not	572 (29.5)	84 (14.7)	488 (85.3)		
Yes	67 (10.5)	7 (10.4)	60 (89.6)	0.68 (03-1.53)	0.46
Amiodarone before admission					
Not	630 (98.6)	90 (14.3)	540 (85.7)		
Yes	9 (1.4)	1 (11.1)	8 (88.9)	0.75 (0.09-6.07)	>0.99
Digoxin before hospitalization					
Not	629 (98.4)	90 (14.3)	539 (85.7)		
Yes	10 (1.6)	1 (10)	9 (90)	0.67 (0.08-5.3)	>0.99
SCF					
≥90	228 (39.2)	22 (9.6)	206 (90.4)		
60-89	234 (40.3)	44 (18.8)	190 (81.2)	2.17 (1.25-3.75)	0.0069
30-59	108 (18.6)	19 (17.6)	89 (82.4)	1.99 (1.03-3.88)	0.06
<30	11 (1.9)	4 (36.4)	7 (63.6)	5.35 (1.45-19.7)	0.04
AST					
≥40	55 (8.6)	15 (27.3)	40 (72.7)	2.5 (1.3-4.76)	0.01
<40	584 (91.4)	76 (13)	508 (87)		
ALT					
≥40	82 (12.9)	19 (23.2)	63 (76.8)	2.02 (1.15-3.58)	0.028
<40	555 (87.1)	72 (13)	483 (88.5)		

FC-functional class, NYHA-New York Heart Association (NYHA) Functional Classification, PCI-percutaneous coronary intervention, CABG-coronary artery bypass surgery, SCF-glomerular filtration rate, ALT-alanine aminotransferase, AST-aspartate aminotransferase.

Table 5: Refined Data on the Influence of Various Factors on the Hospital Mortality of Patients with Ischemic Stroke

Risk factor	OR	95% CI	p
Male	1,05	0,6-1,86	0,858
Age			0,578
Nationality			0,406
Type of OP	0,31	0,03-3,04	0,317
History of myocardial infarction	1,21	0,66-2,21	0,545
History of stroke	0,79	0,46-1,36	0,387
CHF III / IV FC by NYHA	4,96	0,89	0,068
Hypertension			0,674
Ischemic heart disease	0,41	0,13-1,28	0,126
Diabetes	1,83	1,03-3,23	0,039
Peripheral thrombosis	3,44	1,18-10,04	0,024
History of PCI	4,74	1,3-17,28	0,018
History of CABG	2,22	0,44-11,11	0,333
Oncological diseases	2,95	0,83-10,52	0,095
CHA2DS2-Vasc			0,384
HAS-BLED	0,62	0,14-2,84	0,54
Acceptance of anticoagulants before hospitalization			1
β-blockers	0,74	0,3-1,83	0,52
Amiodarone	0,81	0,08-8,31	0,589
Digoxin	0,58	0,06-5,86	0,645
Decreased SCF			0,043
60-89	2,06	1,13-3,74	0,018
30-59	1,64	0,78-3,42	0,19
<30	5,33	1,11-25,56	0,037
ALT≥40	0,38	0,16-0,93	0,033
AST≥40	1,19	0,55-2,57	0,664

Table 6: The Influence of Various Factors on the Hospital Mortality of Patients with Hemorrhagic Stroke

Risk factor	Total, n (%)	Hospital mortality, n (%)		OR, 95% CI	p
Floor		**Yes**	**Not**		
women	60 (63.8)	25 (41.7)	35 (58.3)	0.6 (0.27-1.48)	0,4
men	34 (36.2)	18 (52.9)	16 (47.1)		
Age groups					
<50	3 (3.2)	2 (66.7)	1 (33.3)	1.69 (0.13-21.3)	0,99
50-59	14 (14.9)	6 (42.9)	8 (57.1)	0.6 (0.17-2.4)	0,74
60-69	26 (27.7)	11 (42.3)	15 (57.7)	0.62 (0.2-1.9)	0,58
70-79	27 (28.7)	11 (25.6)	16 (59.3)	0.58 (0.19-1.77)	0,49
80+	24 (25.5)	13 (54.2)	11 (45.8)		

(Table 6). Continued.

Risk factor	Total, n (%)	Hospital mortality, n (%)		OR, 95% CI	p
Floor		**Yes**	**Not**		
Nationality					
Kazakhs	28 (29.8)	10 (35.7)	18 (64.3)		
Russians	61 (64.9)	28 (65.1)	33(54.1)	1.5 (0.6-3.8)	0,5
another asian	3 (3.2)	3 (100)			0,13
other european	2 (2.1)	2 (100)			0,3
Type of OP					
constant	91 (96.8)	42 (46.2)	49 (53.8)		
paroxysmal	3 (3.2)	1 (33.3)	2 (66.7)	0.58 (0.05-6.66)	0.99
History of myocardial infarction					
not	74 (78.7)	36 (48.6)	38 (51.4)		
Yes	20 (21.3)	7 (35)	13 (65)	0.57 (0.2-1.6)	0.4
History of stroke					
not	62 (66)	28 (45.2)	34 (54.8)		
Yes	32 (34)	15 (46.9)	17 (53.1)	1.07 (0.45-2.5)	0,99
CHF (NYHA FC)					
Not	7 (7.4)	2 (28.6)	5 (71.4)		
I	1 (1.1)	0	1 (100)		0,99
II	56 (59.6)	29 (51.8)	27 (48.2)	2.68 (0.48-15.02)	0,45
III	27 (28.7)	11 (40.7)	16 (31.4)	1.7 (0.28-10.5)	0,89
IV	3 (3.2)	1 (33.3)	2 (66.7)	1.25 (0.07-22.9)	0,99
schemic heart disease					
not	12 (12.8)	7 (58.3)	5 (41.7)		
Yes	82 (87.2)	36 (43.9)	46 (56.1)	0.56 (0.16-1.9)	0,53
Arterial hypertension (degree)					
not	8 (8.5)	6 (75)	2 (25)		
the first	1 (1.1)	0	1 (100)		0,67
the second	9 (9.6)	2 (22.2)	7 (77.8)	0.09 (0.01-0.9)	0,09
the third	76 (80.9)	35 (46.1)	41 (53.9)		
Diabetes					
not	74 (78.7)	34 (45.9)	40 (54.1)		
Yes	20 (21.3)	9 (45)	11 (55)	0.96 (0.36-2.6)	0,99
History of bleeding					
not	93 (98.9)	42 (45.2)	51 (54.8)		
Yes	1 (1.1)	1 (100)	0		0,91
Oncological diseases					
not	91 (96.8)	41 (45.10	50 (54.9)		
Yes	3 (3.2)	2 (66.7)	1 (33.3)	2.4 (0.21-27.9)	0,87
Oncological diseases					
not	91 (96.8)	41 (45.10	50 (54.9)		
Yes	3 (3.2)	2 (66.7)	1 (33.3)	2.4 (0.21-27.9)	0,87

(Table 6). Continued.

Risk factor	Total, n (%)	Hospital mortality, n (%)		OR, 95% CI	p
Floor		**Yes**	**Not**		
Anticoagulants before admission					
not	91 (96.8)	41 (45.1)	50 (54.9)		
warfarin	3 (3.2)	2 (66.7)	1 (33.3)	2.4 (0.2-27.9)	0,87
rivaroxaban	0	0	0		
β-blockers before hospitalization					
not	86 (91.5)	38 (44.2)	48 (55.8)		
Yes	8 (8.5)	5 (62.5)	3 (37.5)	2.1 (0.47-9.37)	0,53
Cordarone before hospitalization					
not	94 (100)	43(45.7)	51(54.3)		
Yes	0	0	0		
Digoxin before hospitalization					
not	90 (95.7)	41 (45.6)	49 (54.4)		
Yes	4 (4.3)	2 (50)	2 (50)	1.2 (0.16-8.86)	0.99
Stenting					
not	94 (100)	43 (45.7)	51 (54.3)		
Yes	0	0	0		
USA					
not	90 (95.7)	41 (45.6)	49 (54.4)		
Yes	4 (4.3)	2 (50)	2 (50)	1.2 (0.16-8.86)	0,99
HAS_BLED					
≥3	5 (5.3)	3 (7)	2 (3.9)	1.84 (0.29-11.5)	0,84
<3	89 (94.7)	40 (93)	49 (96)		
CHA2DS2_VASc					
0	1 (1.1)	1 (100)	0		
1	7 (7.4)	4 (57.1)	3 (42.9)		0,99
2+	86 (91.5)	38 (88.4)	48 (94.1)		0,89
SCF					
>90	28 (32.9)	13 (46.6)	15 (53.6)		
60-89	34 (40)	14 (41.2)	20 (58.8)	0.8 (0.29-2.2)	0,87
30-59	19(22.4)	13(68.4)	6(31.6)	2.5 (0.74-8.5)	0,23
<30	4 (4.7)	3 (75)	1(25)	3.5 (0.32-37.5)	0,6
AST					
<40	79 (84)	35 (44.3)	44 (55.7)		
≥40	15 (16)	8 (53.3)	7 (46.7)	1.44 (0.47-4.35)	0,71
ALT					
<40	78 (83)	34 (43.6)	4 4(56.4)		
≥40	16 (17)	9 (56.3)	7 (43.8)	1.7 (0.56-4.9)	0,5

DISCUSSION

A number of scientific papers have been devoted to the problem of identifying possible predictors of mortality in patients with stroke. For example, Peter U. Heuschmann and co-authors conducted a large study involving more than 13,000 patients with ischemic stroke, which resulted in the effect of age associated with AF, previous stroke in history and the severity of stroke on hospital mortality, moreover, in the subgroup of men the effect of diabetes has been found [8].

Ho WM *et al*. In their work distinguish age, severity of stroke on the NIHSS scale, and systolic pressure level as possible predictors of hospital mortality for patients with ischemic strokes, and concomitant cardiovascular diseases and elevated creatinine levels for patients with hemorrhagic strokes [9]. Saumya study H Mittal *et al*. Stroke severity on the NIHSS, MRS scales, and severity of coma on the GCS scale, hyperthermia, low diastolic pressure, hyperglycemia, and elevated CRP levels have affected hospital rtnost patients insultami [10].

In our study, the effects of such factors as severe CHF, type 2 diabetes, peripheral thrombosis, history of PCI, cancer, reduced GFR and elevated ALT levels on intrahospital mortality in patients with ischemic stroke and concomitant AF were found [9].

Diabetes mellitus (DM) is a major independent risk factor for stroke, as demonstrated in a number of studies [11,12]. In a study by Lukman Owolabi *et al*, where the population of patients with ischemic stroke and concomitant diabetes was studied, the mortality rate in the first month was 30, 6% of patients, and mortality during the first 72 hours was 21.2% [13]. In our study, similar data were obtained. Hospital mortality of patients with diabetes and ischemic stroke was 21.3%. In the work of BB Hamidon and AA Raymond, the hospital mortality of patients with ischemic stroke and diabetes was lower and amounted to 11.7%, however, as in our study, the effect of diabetes on hospital mortality was clearly proved (OR 4.88.95% CI: 1.25 -19.1) [14].

Cancer has been shown to increase the risk of thromboembolic complications, including ischemic strokes, with a mortality rate of about 25% within 30 days after the onset of a stroke [15]. In a study by Zhang YY and co-authors, the mortality rate for patients with ischemic strokes in the group with concomitant cancer the disease was 30%, while in the group without cancer, the figure was 14% (p = 0.078) [16,17]. Karoliina Aarnio and co-authors concluded that an active oncological process is an independent death factor These patients with ischemic stroke [18]. In our study, the mortality of patients with ischemic stroke and AF in the group with associated cancer was 33.3%, in the group without cancer pathology 13.8% (OR 3.13, 95% CI: 1.04-9.38) however, after the calculation of refined indicators, statistical significance was lost.

Renal failure is a predictor of severe neurological disorders and mortality in both patients with ischemic and hemorrhagic strokes, which may in part be due to limitations of pharmacotherapy [19,20]. Minesh Khatri and co-workers studied the effects of acute renal failure (ARF) on stroke outcomes. OPN was diagnosed in 14% of patients with ischemic and 21% with hemorrhagic strokes, while the APN had a statistically significant effect on hospital mortality among patients with ischemic strokes (OR 3.08, 95% CI: 1.49–6.35), but relative to patients with hemorrhagic stroke this connection was not found (OR 0.82, 95% CI: 0.50–1.35) [21]. In another study, Adrian Covic *et al*., renal failure was also identified as an independent risk factor for death from stroke. Thus, the mortality of patients with renal failure was 14% for ischemic and 36.3% for hemorrhagic strokes, while it was noted that patients with PN were older, more often had concomitant cardiovascular diseases [22]. In our study, a statistically significant effect was observed to reduce GFR for hospital mortality in patients with ischemic strokes and concomitant AF (OR 5.33, 95% CI: 1.11-25.56) [10].

Regarding the effect of severe CHF on hospital mortality in patients with ischemic strokes and AF, we identified a link between CHF III / IV FC and mortality (OR 5.25, 95% CI: 1.21-22.7, p = 0.016), but after calculating the updated data, the statistical significance was lost Conclusions regarding the effects of peripheral arterial thrombosis and past interventions on hospital mortality in patients with ischemic strokes, although they have a rational explanation, are not convincing enough given the small number of patients [11].

In our study, there was an increase in hospital mortality of patients with AF and ischemic stroke in the group with elevated ALT levels (OR 0.38, 95% CI: 0.16–0.93, p = 0.03). Search for similar results in other studies did not give results. Sabin CA *et al*. Studied the effect of elevated ALT on the development of cardio / cerebrovascular events in HIV-infected individuals. As a result, no association was found between the level of ALT and the development of myocardial infarction and stroke.

Findings. In our study, hospital mortality in patients with ischemic strokes and AF was 14.24%, patients with hemorrhagic strokes were 45.7%. A statistical significant association of hospital mortality was noted for type 2 diabetes mellitus (OR 1.83, 95% CI: 1.03–3.23, p = 0.039), peripheral vascular thrombosis (OR 3.44, 95% CI: 1.18–10.04, p = 0.024) , ChKV in history (OR 4.74, 95% CI: 1.3-17.28, p = 0.018), reduced GFR (p = 0.043) and increased ALT level (OR 0.38, 95% CI: 0.16-0.93, p = 0.03). Concerning the effect of any demographic or clinical factors on the mortality of patients with hemorrhagic stroke and concomitant AF, no conclusive data has been obtained [12].

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