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Clinical and Epidemiological Characteristics of Hemorrhagic Stroke in Surkhandarya Region

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D.E.Iskandarova, D.D. Usmanova

"CLINICAL AND EPIDEMIOLOGICAL CHARACTERISTICS OF HEMORRHAGIC STROKE IN SURKHANDARYA REGION"

Monograph

"TASDIQLANDI"
O'ZBEKISTON RESPUBLIKASI SOG'LIQNI SAQLASH VAZIRLIGI TOSHKENT TIBBIYOT AKADEMIYASI TERMIZ FILIALI MUVOFIQLASHTIRUVCHI EKSPERT KENGASHI
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In the monograph are considered problems related to the clinical and epidemiological characteristics of stroke specific to arid zones. The author of the monograph puts forward his hypotheses about the clinical and epidemiological features of hemorrhagic stroke in Surkhandarya region.

This monograph is intended as a practical guide for neurologists, family doctors, clinical residents, masters of neurology and children's neurology specialties, and all specialists interested in this pathology.

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LIST OF ABBREVIATIONS

AS – Atherosclerosis

BT - the basic treatment

ACCD - acute cerebral circulation disorder

DS – Duplex scanning

FAB – The Frontal Assessment Battery

WHO - World Health Organization

CT - Computed tomography

ICD-10 – International Classification of Diseases 10th revision

Mini-Cog – Mini-Cog test

MMSE – Mini-Mental State Examination (Short Mental State Scale)

CNS - Central Nervous System

MRI - magnetic resonance imaging

NIHSS - National Institute of Health Stroke Scale

CVD - Cerebral vascular diseases

SBRSCEMC - Surkhandarya Branch of the Republican Scientific Center for Emergency Medical Care

CVD - Cerebrovascular diseases

SAH - Subarachnoid hemorrhage

IDA -Iron deficiency anemia

ITSC - iron trihydroxide sucrose complex

RCT - Randomized Control Trials

UTD - ultrasound dopplerography

RF - Risk factor

INTRODUCTION

Stroke is a cerebrovascular disease that causes sudden neurological deficits due to the interruption of blood supply to the brain, resulting in the disruption of brain function. It is ranked as the second most common cause of death worldwide and leads to the highest number of disabilities globally. The incidence of this disease is 10-20 cases per 100,000 population, reaching 15% of all strokes worldwide yearly. The highest mortality rate was 20.3% after 48 hours and 18.3% less than 48 hours. This number is greater than the death rate in stroke infarction [1; 1-3-p].

The prevalence of cerebrovascular diseases, especially among the working population, not only leads to a significant reduction in the labor force, but also causes serious economic damage, estimatedby the loss of the country's gross domestic product (GDP) due to premature death, temporary disability and disability (Cherentsova OI and others, 2013; Khaidarov NK, 2019).

Hemorrhagic stroke is diagnosed in 7-8 % of patients with stroke. The disease is characterized by severe pathogenesis with mortality up to 50% and disability up to 80%.

The introduction of preventive treatment and measures to reduce the impact risk factors of stroke in the global population has been found to contribute to a significant reduction in the incidence rate in different age and gender groups world wide during the last 40 years (Feign VX, Lawes CM et al., 2009). Therefore, the search for new risk factors of cerebrovascular diseases and the study of pathogenetic mechanisms of disease development are of particular importance (Belova LA, 2010). Jayoon Heo, Tae-Mi Youk, and Kwon-Duk Seo reported (2021) andthe risk of death after hemorrhagic stroke is related to a number of risk factors, including anemia. Many studies show that stroke is related to climatic conditions (LS Kornilova et al., 2017; Z.-Y. Chen et al., 2007). During the development of a stroke, sudden changes in air

temperature and atmospheric pressure, wind speed, change of normal seasonal temperature (Yu. I. Kravsov, ANBogdanov, 2007; Ye. A. Sazanova et al., 2018; K. Ebi et al., 2017) and high magnetic activity (TK Breus, 2009; NG Voropay, BMDoronin, 2019) has been found to increase the number of diseases. Other studies have shown that air vehicles (SP Markin et al., 2013; S.-S. Tsai et al., 2013), the maximization of nitrogen oxide concentration (F. Corea et al., 2009; R. Maheswaran et al. ., 2008; S. Vidale et al., 2010), solids (R. Low et al., 2016; R. Maheswaran et al., 2015; S. . Tsai et al.) carbon (II) oxide (F. Corea and oth., 2009; G. Hoek and oth., 2011; S.-S. Tsai and oth., 2009), sulfur dioxide (G. Hoek and oth., 2011; R. Low and oth., 2016), ozone pollution (G. Hoek et al., 2011), chronic exposure to gas (in people living near highways) (R. Maheswaran et al., 2013) and one-time exposure to pollutants (S.-S. Tsai et al., 2013; GA Wellenius et al., 2015) increased stroke rates. In the data of a number of researchers, on the other hand, it is shown that there is no reliable connection of environmental conditions with stroke disease (N.Yu. Ayriyan et al., 2010; MVKolesnikov, 2013).

Thus, the development of hemorrhagic stroke depends on various holistic factors. It is known that there are three main strategies for the prevention of non-communicable diseases: population-based, strategies for high risk factors and secondary prevention (Global strategy for the prevention and control of non-communicable diseases. WHO (Geneva) 2008). Primary prevention, including correction of the main modifiable risk factors (Suslina ZA., Piradov MA, 2018) is of primary importance in reducing morbidity, mortality and disability.

Currently, a risk factor for the development of a disease is understood as a variety of clinical, biochemical, behavioral and other characteristics characteristic of a person (or individual populations), as well as an external influence that indicates the risk of developing a certain disease. (Suslina ZA, Varakin YuL ., Vereshchagin NV, 2017).

It should be noted that preventive treatment and the introduction of measures to reduce the impact of hemorrhagic stroke risk factors on the world population have helped to significantly reduce the incidence rate in different age and gender groups worldwide over the past 40 years (Feign VX, Lawes CM et al., 2009).

At the same time, the search for new risk factors of CVD and the study of pathogenetic mechanisms of CVD development continue (Belova LA, 2010).

In recent years, the analysis of clinical-epidemiological characteristics in a certain region has been significantly effective in studying various problems of hemorrhagic stroke. In particularly, Bidenko M.A., in this regard, Irkutsk city (2011); S.D. Yaroslavl Prozorovskaya city(2011); Lebedov I.A. Khanta-Mansiysky autonomous district (2011); Kotova Ye.Yu. Ulyanovsk city (2009); G.O. Kom Republic of Penin (2013); Klochikhina O.A. on the Russian Federation (2018), Palvonov A.J. Fergana city (2012), Radjabaliyev Pamir mountain regions (2008); Lee Ye. Yu. Atyrou region (2010); Shamuratova G.B. Khorezm region (2010); Ajiyeva Z.B. (2011) devote the Nukus city had been defended their dissertation.

In our republic, the degree of stroke in Nukus depends on the season (more in spring) (Asadulllayev M.M., Ajiyeva Z.B., 2011y). In the city of Fergana, the relationship between stroke mortality and the provision of medical services during the "therapeutic window" (Asadulllayev M.M., Palvonov A.J. 2012y) was determined. The impact of meteo-heliophysical and climatic factors on brain stroke in the arid, desert, mountainous regions of the Republic was determined (Qilichev A.A. 2010). Also, specific features of the course and clinic of cerebral stroke during the "Afghan" wind in arid zones were studied (Ziyakulov S.O., Madjidov N.M., 1999; 2020). It has been determined that the recovery of neurological function in stroke patients depends on the location of the focus and the number of risk factors (Shamuratova G.B. 2010).

Today, the incidence, death, and disability rates of acute cerebrovascular disorders are extremely high, and they are getting younger year by year, one of the urgent problems of modern medicine. Special attention is paid to large-scale scientific research aimed at identifying the risk factors of acute cerebrovascular blood circulation in the world, developing appropriate measures taking into account the main risk factor in a certain region, individual medical and social rehabilitation and a modern comprehensive approach to effective treatment. In this regard, a number of scientific studies are being carried out in order to study the course and complications of hemorrhagic stroke in different regions according to its causes, to optimize high-tech methods and criteria for early diagnosis, to improve treatment methods, and to identify factors that lead to disability, to create effective forecasting models. It is very important to study the prevalence of cerebral hemorrhagic stroke, the study of the causative factors, especially in regions with severe climatic conditions, which cause arterial hypertension and vascular atherosclerotic damage in the human body [25; 44-45 - b; 50; 55-57 p].

The incidence of stroke in the whole world is 10.3 million cases per year, approximately 6.5-6.7 million cases are fatal. Death from stroke in Uzbekistan is equal to 17.4%, and this indicator is considered to be 1.5 times higher in rural areas than in urban areas (B.G'. Gafurov, 2016). The death rate from acute cerebral stroke in Uzbekistan is 55.4% among all causes of death and is one of the highest rates in the world. At the same time, death related to CVD accounts for 83.9% ofall deaths (Gafurov B.G., 2016; Majidova Y.N., 2018; Khaidarov N.K., 2019).

In our country, extensive work is being carried out aimed at the fundamental improvement of the quality of medical services provided to the population and the development of the health care system. In this regard, "...the factors of development of non-communicable diseases, including dispensation and screening-research among patients belonging to the risk group in primary medical and sanitary care institutions, introduction of effective

models of patronage and dispensation, development of rehabilitation medicine, "inpatient at home" tasks such as early detection by expanding the service ... »[1]. In the implementation of the specified tasks, scientific researches are carried out in such directions as early identification of risk factors for the spread of neurological diseases among the population and prevention of complications, then increasing the completeness of medical and social assistance to the population, reducing disability indicators, and improving the quality of life.

Taking into account the above, the purpose of this work is to determine the impact of the main risk factor on the course of the disease, the effectiveness of treatment and, accordingly, to develop proposals and recommendations for the study of clinical and epidemiological characteristics of hemorrhagic brain stroke in Surkhandarya region

The purpose of the work defined the following tasks:

1) to assessment of subtypes and prevalence of hemorrhagic stroke among the population of Surkhandarya region in all districts, determination of morbidity and mortality rates in the region;

2) to determine the main risk factors of hemorrhagic stroke in persons who have had a hemorrhagic stroke and who have had the disease;

3) to assessment of the effect of the main risk factor on the course of hemorrhagic stroke and to estimate its treatment using neurological scales;

4) to development of recommendations for the prevention of acute cerebrovascular disorders in different population subgroups, taking into account the specific characteristics of hemorrhagic stroke.

During the research, the results of clinical and neurological tests (Hunt-Hess, original, Orgogozo, self-care rating, Scandinavian, Glasgow, NIHSS scales), registry questionnaires, laboratory analysis (coagulogram, iron in blood, folic acid in blood, determination of cobalamin and ferritin in blood),

[1] Decree of the President of the Republic of Uzbekistan dated December 7, 2018 No. PF-5590 "On comprehensive measures to fundamentally improve the healthcare system of the Republic of Uzbekistan"

neuroimaging (MSKT, duplex scanning of intra- and extracranial arteries) and statistical research methods were used.

Scientific and practical significance of research results.

The scientific significance of the research is that the results obtained during the research work based on clinical neurological, neurovisual and laboratory indicators of stroke are interpreted with a comprehensive approach, taking into account the pathogenetic features of hemorrhagic stroke development, the influence of risk factors on the course of the disease, and taking into account concomitant diseases in the treatment to reduce complications.

The practical significance of the research results is the development of diagnostic criteria, differential treatment of hemorrhagic stroke patients in different clinical groups according to the type of accompanying anemia, development of preventive measures according to the type of risk factor identified in areas, prevention of the disease, early diagnosis and is explained by the optimization of therapy.

CHAPTER 1. CLINICAL EPIDEMIOLOGY AND RISK FACTORS OF HEMORRHAGIC STROKE IN SURKHANDARYA REGION

§1.1. Distribution of hemorrhagic stroke in Surkhandarya region and its specific characteristics to the region.

Hemorrhagic stroke is one of the global problems of modern medicine and have a high percentage among the causes of disability and death. In recent years, the analysis of clinical - epidemiological characteristics in a certain region has been significantly effective in studying various problems of stroke. Determining the epidemiology of the disease, its structure, risk factors, as well as the influence of various geoclimatic and socio-economic conditions on the course of the disease is an important direction of the problems of cerebral stroke.

In the Surkhandarya region, which is a separate subject of Uzbekistan, the study of the above is of urgent importance in reducing the prevalence and serious complications of stroke.

Borders three neighboring countries (Turkmenistan to the southwest, Tajikistan to the north and east, and the Islamic Republic of Afghanistan at a distance of 180 km along the Amudarya River). As a region, the study of the above is of urgent importance in reducing the prevalence of hemorrhagic stroke and its serious complications. The total land area is 20.1 thousand km^2. The climate is sharply continental, high temperature reaches 50 C^0, in sandy deserts it reaches 70 ^0C [3; 155-156 - p].

It consists of 14 districts (Angor, Bandikhon, Boysun, Denov, Jarkurgan, Muzrabot, Altinsoy, Sariosiya, Termiz, Uzun, Sherabad, Sho‘rchi, Kyziriq, Kumkurgan), 8 cities (Boysun, Denov, Jarkurgan, Termiz, Shargun, Sherabad, Sho‘rchi, Kumkurgan), there are 114 towns, 865 rural settlements (2019). The center of the region is Termiz city. According to the information provided by the Statistical Office of Surkhandarya region, the number of permanent residents of Surkhandarya region as of January 1, 2021 is 2,681,000 people,

including 971,400 urban residents (36.2% of the total population), the number of rural residents is 1709.6 thousand people (63.8%).

Surkhandarya region, its geographical, ecological, climatic, demographic conditions and their connection with diseases have been studied by a number of scientists.

In particular, one of the most urgent environmental problems for the health of residents of Jarkurgan, Angor, Termiz districts and the city of Termiz (in spring and summer) is the dry and hot, chronic "Afghan" wind, that brings dust from the northern regions of the Republic of Southern Afghanistan, causing great damage to agricultural crops and having a serious negative impact on the health of the population [199; 94-101-b; 200; 6-17-b].

A number of districts and environment of the Surkhandarya region of the Republic of Uzbekistan are being aggressively affected by transboundary pollutants released by the Tajikistan aluminum plant, especially hydrogen fluoride. Taj AZ is located at a distance of 8-10 km from the state border of the Republic of Uzbekistan, and according to the project, it has a production capacity of 517 thousand tons of aluminum [8; 9-20-b];

1. For the production of one ton of aluminum, 43-48 kg of fluorine is consumed, of which 63 - 68 % is released into the air in the form of hydrogen fluoride. According to the latest information, this situation is showing its strong reaction effect especially in Uzun, Saryosiyo, Denov, Altinsoy, Sho‘rchi, Kumkurgan districts of our region even in Jarkurgan districts.
2. According to the results of the research, it is very unfortunate that the amount of hydrogen fluoride in the atmospheric air and soil of the above - mentioned districts is 12 - 24 times more than the norm. In particular, animal milk contains 13.5 - 15.6 %, potatoes contain 20-25 %, and pomegranate contains 20 – 27 % hydrogen fluoride.
3. Up to 45,000 tons of various wastes are released into the air from Taj AZ every year, of which an average of 116 tons are

hydrogen fluoride, 21,000 tons of sulfur, carbon, nitrogen oxides and various other plant, animal, soil, water and consists of chemically aggressive substances that are extremely dangerous for humans.

4. As a result, the amount of hydrogen fluoride in the soil became 70 - 180 mg/kg instead of the permissible norm (REM) of 10 mg/kg, compared to 1991 (30.1 s), the harvest of grapes in Uzun district in 2008. It was found that the number and productivity of large horned animals has decreased to 30 – 40 %.
5. In the last 20 years, up to 400 tons of cocoons were produced annually in Uzun and Sariosia districts until the 1990s, when cocoon production was completely stopped. Dashnabad pomegranates, which are famous in the world, do not meet the standard requirements.

Among the population, the rate of early miscarriages, stillbirths of babies without arms or legs has increased by 2.5 - 4 times compared to 1991, due to the fact that the amount of elements such as fluorine, chromium, and antimony in the human body is higher than normal. In 2005, compared to 1990, it is observed that diabetes increased by 2.5 - 4.0 times, allergic diseases by 2.0 - 4.0 times, goiter, fluorosis by 3.0-5.0 times [8; 9-20 p].

The above - mentioned and other problems affect the clinical and prognostic characteristics of cerebrovascular diseases, including hemorrhagic stroke.

In recent years, paraclinical studies are focused on identifying the underlying diseases that cause cerebrovascular accident. After all, it is important to know the anamnesis data and risk factors to determine the clinic and nature of hemorrhagic stroke. Results of registry questionnaires (Appendix 1) conducted in Surkhandarya region (6096 patients with hemorrhagic stroke during 2018-2021 and the first 6 months of 2022 and questionnaires). According to questionnaires and a retrospective study of the history of 770 patients treated in the emergency neurology department of the Surkhandarya branch of the Respulika emergency medical research center,

relatively frequently noted risk factors of hemorrhagic stroke were studied. It was found that the main risk factors of stroke in Surkhandarya region are arterial hypertension, anemia and diabetes.

§1.2. Significance of registry questionnaires in the study of clinical and epidemiological features of hemorrhagic stroke

Studies have shown that the overall risk of recurrent hemorrhagic stroke in the first 2 years is 4 – 14 %, with a 2 – 3 % risk of recurrent hemorrhagic stroke in the first month. It is 10 – 16 % in the first year, and 5 % in the following years, which in turn increases similar indicators 15 times among representatives of the same age and sex in the general population [123; 101-105-b]. The current situation can be changed by creating an adequate system of providing medical and preventive care to the population.

Accurate epidemiological data (main epidemiological characteristics: morbidity, mortality rate, mortality after stroke), risk factors for planning and creating an effective system of hemorrhagic stroke prevention, treatment and rehabilitation of stroke patients it is necessary to analyze, to study the existence and effectiveness of preventive measures, to evaluate the effectiveness of organizational and therapeutic measures [236; 1866-1877-b].

In the analysis of the conducted scientific studies, it was found that the individual characteristics of the male and female organisms of patients are fundamentally different from each other, and diagnostic studies are required, taking into account the gender characteristics. At the same time, it is necessary to take into account the hemodynamic indicators and homeostasis characteristics of a person's life, which are sharply different from each other in the period of youth, maturity and especially old age. These differences were the basis for a number of epidemiological investigations.

The population - based REGARDS research compared the age - related prevalence of stroke between men and women. It became known that the prevalence of stroke among representatives of European and Negroid races at a relatively young age (45 - 54 years) is lower in women than in men. But as age passes, this indicator

becomes equal. In particular, the incidence of stroke at age 85 and older was almost 3 times higher among Negroid women and 2 times higher among Caucasian women than men of the same age. According to the results of a population study conducted in Sweden (U. Lotmark et al., 2007) and the Oxford Vascular Study (Oxford Vascular Study, P. Rothwell et al., 2005), the incidence of stroke at the age of 55 - 64 years is higher than that of men, in women under 60 while after 75 years of age 50% more cases started in women. In the United States, the gender ratio of mortality from stroke has been determined in different age groups (M. Reeves et al., 2008).

Thus, today the information about gender characteristics in local and foreign literature is contradictory, and further clarification is required not only in terms of parameters of epidemiological studies, but also in terms of risk factors.

Among the risk factors, it was found that the frequency of stroke in elderly patients with swinging arrhythmia is increased by 6 times, in case of heart failure - by 5 times (Gafurov B.G., 2015) [2 ; 94-95 p .]. In Uzbekistan, the number of patients with brain stroke is quite high – 40 - 45 thousand cases of stroke are recorded per year. More than 80% of stroke patients permanently lose their ability to work and only 10.2% return to work [2; 93-96 -b]. The relevance of stroke problems is also related to the aging of the patient contingent [28; 101-102 -b ; 39; 300 -b]. Among young people, strokes account for 2.5 to 14 % of the total stroke population [95; 9-11 -b ; 97; 85 -b]. In this case, the stroke structure corresponds to hemorrhagic stroke in 55 % of patients under the age of 44 and ischemic stroke in 45 % [8 ; 564 -b].

In the city of Tashkent, it was equal to 1.61-1.64 per 1000 people, the incidence rate of stroke in men was 0.9 per 1000 people and 0.74 in women. According to B.G'. Gafurov et al., strokes occur in 35,000 people a year in Uzbekistan, and the incidence of strokes is 1.3 times higher in ecologically poor regions (Aral region) than in the whole Republic. These authors note that stroke is more commonin women in rural areas and in men in urban areas. In our country, the average rate of disability from cerebral stroke is 83.8%, 94.7% in the city and 72.9% in the countryside. This situation observed in Uzbekistan requires improvement of the problems of disease prevention, diagnosis and emergency care [6 ; 13-14 -b].

Attempts to establish patterns of incidence of cerebral hemorrhagic stroke in the population began a long time ago, but they used different sources and used non-standardized criteria for diagnosis. In turn, the information given by different authors differed sharply from each other, and it was not possible to coordinate them. Real morbidity, mortality rates, as well as pre-hospital rates and the dynamics of these rates can only be obtained by studying the dynamics of these rates among a certain population group over a long period of time. For this purpose, the "Acute Cerebral Stroke Registry" was developed by the World Health Organization with standardized examination methods and diagnostic criteria. The use of this program allows to evaluate the actual indicators of the incidence of acute brain stroke and the effectiveness of providing assistance to patients at different stages of treatment [1 ; 35 s]. Randomized control trials (RCTs) are rightly at the top of the hierarchy of evidence in evaluating the effectiveness of therapeutic procedures. Nevertheless, TNS has a number of disadvantages that require additional registry checks.

According to data from the 2006 - 2007 cerebral stroke registry in Kyrgyzstan, morbidity and mortality rates were high among the population of the capital of the Republic. The obtained reliable statistical data made it possible to identify and correct deficiencies in the organization of the angioneurological service. Through the registry, it ensured coherence between the primary (group of family doctors) and the third level (specialized national hospital departments) of the health care system [122;85-86 -b]. According to the results of the registry conducted in the Atyrau region of Kazakhstan, a systematic approach to the organization of care for stroke patients was insufficient and ways to eliminate the problems were developed accordingly [113; 22-25 -b].

§ 1 .3 The role of anemias in the development and progression of hemorrhagic stroke

Anemia (Yun. an - negative suffix and haima - blood), anemia - a disease characterized by a decrease in the number of erythrocytes and hemoglobin in the blood and a change in its quality. Anemia can be caused by a violation of the process of blood formation, sudden or chronic blood loss, excessive breakdown of red blood

cells (erythrocytes), failure of the main blood-forming tissue - the bone marrow. Anemia caused by iron and vitamin B_{12} deficiency is quite common [70; 225 -b; 98; 120-121 -b].

Anemia, according to World Health Organization, [51; 13 -b] is more common in women(Hb level <12 g/dl) than in men (<13 g/dl). Low initiallevels of Hb, Ht (hematocrit) and their reduction are closely related to poor outcome and development of death in acute ischemic stroke. A reduction in these two values during hospitalization may have a greater impact on treatment outcome than baseline Hb and Ht levels on admission [59; 22-b].

It has been proven in several studies that in hemorrhagic stroke, the indicators of the neurological status according to the Garcia J.H. scale decrease due to the decrease in the amount of erythrocytes in the blood, the concentration of hemoglobin, and the increase in the number of leukocytes and neutrophils.

Also, recently, anemia is considered an important risk factor of hemorrhagic stroke, and it is noted that it is directly related to the death rate in hospitals. However, the relationship between anemia and mortality in hemorrhagic stroke is somewhat difficult to understand, and the results of several epidemiological studies are inconsistent [6;25-b; 7; p. 68-69; 8; p. 23]. To our knowledge, the quality and consistency of the evidence on this topic is insufficiently studied, suggesting that a comprehensive study of the association between anemia outcomes and stroke prognosis is warranted, depends on a number of substances in the body and our research aim is at studying the iron, vitamin B_{12}, folic acid and ferritin in the blood that participate in this processin patients with stroke.

Folic acid (vitamin B_9) is a chemical compound without which DNA and some amino acids cannot be synthesized. It enters the body with food, and its excess is excreted with urine, therefore, first of all, its deficiency in the body is of clinical importance, as the most rapidly updated - blood cells (anemia develops) and skin cells (wounds heal more slowly) suffer. The work of the

gastrointestinal tract also worsens, and the risk of developing cardiovascular and oncological diseases increases. Usually, the amount of vitamin B_9 is measured in nanograms per milliliter (ng/ml), and the norm is from 3 to 17 (3.89-26.8) ng / ml [9 1; 100-p].

Vitamin B_{12} (cyanocabalamin) is a vitamin that plays a key role in the formation of red blood cells, the functioning of the nervous system, the processes of cell and tissue exchange, and the synthesis of nucleic acids. Lack of vitamin B_{12} leads to the development of macrocytic anemia, in which the number of red blood cells in the blood decreases and the size of each of them increases (such cells are called macrocytes). Macrocytes have a shorter life span and an increased tendency to hemolysis (destruction), so they cannot fully supply organs and tissues with oxygen. The level of cyanobalamin in the blood is measured in picograms per milliliter (pg/ml) and its value is 193-982 (197-771) pg/ml. Subnormal levels of vitamin B_{12} are clinically significant, but excess levels are usually uncontrolled [91; 12-b].

Ferritin or stored iron is a protein compound that stores iron in the tissues of the human body. In other words, ferritin is an indicator of iron content in the body, which is very important and convenient for the diagnosis of various pathological processes along with iron deficiency.

Douglas Kell, professor of biochemistry in England, says that serum ferritin comes from damaged cells and is therefore a direct indicator of cellular damage throughout the body. The serum ferritin level is related to the total amount of this protein in the body. Serum ferritin concentration is a very sensitive indicator of iron deficiency, which is not complicated by other concomitant diseases. As iron deficiency develops, plasma ferritin levels decrease long before changes in hemoglobin concentration, red blood cell volume, or iron concentration are observed. Determination of ferritin concentration is important for differential diagnosis of anemia of chronic diseases (anemia accompanied by chronic infectious, rheumatic and neoplastic diseases). One of the main mechanisms of anemia of chronic diseases is the

redistribution of iron in the cells of the macrophage system, which is activated during inflammatory (infectious and non- infectious) or tumor processes, which leads to a decrease in the level of iron in the blood serum. In this case, iron accumulates in the form of ferritin, but its transition from ferritin to transferrin is disturbed. In such conditions, the incorrect diagnosis of iron deficiency anemia and the appointment of iron preparations (parenteral) can lead to the development of secondary hemosiderosis and exacerbation of the disease. True iron - deficiency anemia and chronic anemia can only be distinguished if the serum ferritin level is determined. In iron deficiency anemia, there is a decrease in the level of iron and ferritin in the blood serum; in anemia of chronic disease, a decrease in serum iron is combined with an increase in the level of ferritin.

An increase in the level of ferritin under conditions of acute inflammationnot only indicates the amount of iron in the body, but also can be a manifestation of the acute phase reaction, since ferritin is one of the acute phase proteins. However, if the patient really has iron deficiency, the increase in the acute phase of ferritin is not significant. In oncopathology, especially bone marrow tumors and metastatic processes, ferritin serves as a type of tumor markers. Ferritin level may increase in liver pathology. In healthy adults, the conditionally normal level of iron in the body is 4-5 grams. Although the amount of ferritin in the blood is quite low, comparing its concentration with reference values allows you to get an idea about the total iron reserves in the body. Thus, it is advisable to conduct ferritin studies together with blood tests (total, hemoglobin, hematocrit or quantitative indicators of erythrocytes) in cases of suspected iron deficiency or excess in the body [299 ; 511 –b].

IDA has been suggested with stroke, but so far only a few cases have proven it. There are three physiological mechanisms thatexplain the association of IDA with hemorrhagic stroke: a secondary hypercoagulable state, secondary thrombocytosis, and anemic hypoxia induced by IDA. Iron deficiency lowers the amount of hemoglobin, resulting in less oxygen in the blood, resulting in

less oxygen being delivered to the brain. This causes hypoxic conditions in the brain, which leads to the death of brain tissue [114; 89-91 -b].

The brain is very sensitive to iron deficiency, which negatively affects its work. Iron in the brain tissue is involved in the generation of nerve impulses in nerve synapses, in the processes of myelination of nerve fibers, and affects the functions of various brain structures, including the hypothalamus [23;2 -b ; 86;20- 25 -b]. Iron is an important element involved in the implementation of the main functions of life support.

Summary for Chapter I

Hemorrhagic stroke is main reason of invalidity, death and high costs in the health care system worldwide. This is a daunting task that requires the health care system to continually improve stroke care. Accordingly, in different regions of our Republic, taking into account climate, demographic and other aspects, the national stroke registry is effectively used in the study of this disease.

Reyesters are useful in evaluating clinical efficacy and fruitful results of cure in hemorrhagic stroke patient populations. Registries provide a clear picture of clinical practice, enabling continuous learning and quality improvement. They are useful in addressing differences in health care servise amidst different population groups and the flow of new technology use and quality of care . A number of districts of the Surkhandarya region of the Republic of Uzbekistan (Sariosiyo, Uzun) are being aggressively affected by transboundary pollutants, especially hydrogen fluoride, emitted by the Tajikistan aluminum plant. Taj AZ is located 8-10 km from the state border of the Republic of Uzbekistan, and according to the project, it has the capacity to produce 517 thousand tons of aluminum. In addition, one of the biggest environmental problems for residents of Jarkurgan, Angor, Termiz districts and the city of Termiz is the chronic "Afghan"wind (spring, in the summer months) is dry and hot and has a significant negative impact on the health of the population.

It was found that arterial hypertension, iron deficiency anemia and diabetes mellitus are the main risk factors of hemorrhagic stroke in Surkhandarya region.

CHAPTER II. CLINICAL MATERIAL AND EXAMINATION METHODS FOR DETERMINING REGIONAL CHARACTERISTICS OF ACUTE CEREBRAL CIRCULATION DISORDERS

§ 2.1 Characteristics of clinical material

As we know, Surkhandarya region consists of 14 districts and the regional center is Termiz city. Districts in the province and their population are listed in table 2.1 (thousands of people as of January 2021):

Table 2.1

Distribution of permanent population by sex

Districts	**Male (n=in absolute numbers, thousand people)**	**Female (n=in absolute numbers, thousand people)**
Surkhandarya region	1354.8	1326.2
Termiz city	90.3	92.6
Districts :		
Oltinsoy	92.4	87.7
Angor	67.4	67.3
Bandixon	39.1	37.9
Boysun	60.2	57.3
Muzrabot	71.5	72.7
Denov	200.2	192.1
Jarqo‘rg‘on	113.9	108.2
Qumqo‘rg‘on	118.1	120.6
Qiziriq	58.5	57.4
Sariosiyo	106.4	106.7
Termiz	39.5	39

Uzun	88.8	85.1
Sherobod	100.1	97.3
Sho‘rchi	108.4	104.3

Collected register questionnaires from all 14 districts of Surkhandarya region and the city of Termiz for 2018-2021 and the first 6 months of 2022 and data from the statistics department of the regional health department, treated in the emergency neurology department of SBRSCEMC. The medical history of the patients was analyzed retrospectively. The patients were divided into 4 groups proposed by the World Health Organization in terms of age, and the type of stroke, affected brain center, anamnesis, main risk factors, place of treatment and results were studied according to the registry.

Information was studied according to the questionnaires of the National Stroke Register provided by the Association of Neurologists of Uzbekistan (Appendix 1). 49 % (n=2987) of studied patients (6096) were women, 51% (n=3109) were men. However, according to the regional statistical center, the number of women in the region was 15,679 more than men in 2018-2020. So, in Surkhandarya region, stroke was recorded more in men during these years. Only asof January 1, 2021, the number of men increased by 28.6 per thousand people (Figure 2.1).

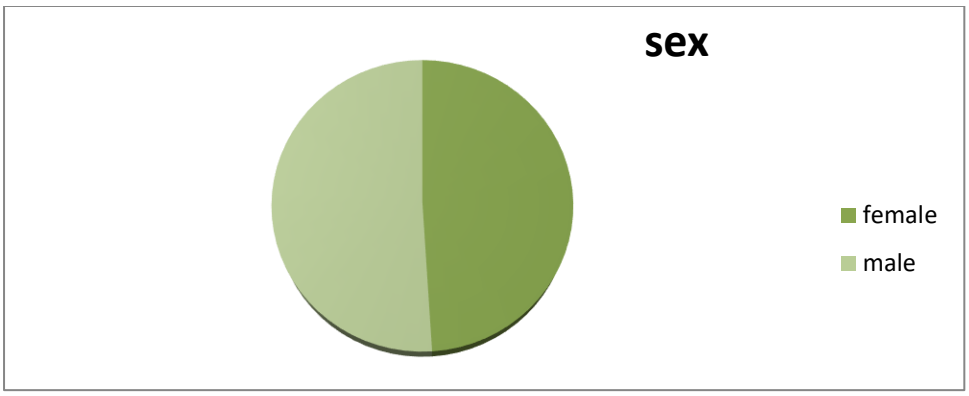


Figure 2.1 Distribution of stroke by gender in the region

Patients were divided into age groups according to the classification provided by the World Health Organization [100;225-b]. By age, 2% of

patients are long-lived (90 years and older), 9% are elderly (75-89 years), 41% are elderly (60 - 74 years), 36% are middle - aged (45-59) young people, 12% (18 - 44 years old) made up young people. In the longevity group, there were 3 more women than men. In terms of districts, the number of men was higher than women in all districts except Uzun, Muzrabot district and Termiz city.

Based on the obtained data – clinical - neurological analysis, dynamic evaluation of the course of the disease, laboratory and neuroimaging data, the risk factors of stroke in young patients were studied in comparison with these signs in older patients. The type of stroke was determined based on the clinical picture and anamnesis data. The diagnosis of hemorrhagic stroke (from a total of 6096) was confirmed in 2352 cases by MSCT, 221 cases by brain MRI. Also, according to the purpose of the scientific research, randomly selected patients (102 patients) who were admitted to the emergency department of neurology of the Surkhandarya branch of the Republican scientific center of emergency medical care with iron deficiency anemia and were diagnosed with iron deficiency anemia were selected. Blood analysis results of 20 age - matched healthy people were included for comparison in the control group. 102 hemorrhagic stroke patients in the comparison group were divided into 2 groups according to the results of blood analysis (group 1: hemorrhagic stroke patients with iron deficiency anemia; group 2: hemorrhagic stroke patients without iron deficiency anemia) and the course of stroke was compared in both groups. According to the method of treatment, group 2 was also divided into two groups: subgroup №1: treatment of hemorrhagic stroke was treated only on a standard basis. In the 2nd subgroup, iron preparations were used together with standard basic treatment.

§ 2.2 Research methods

Clinical examinations: general somatic, neurological, paraclinical: instrumental, laboratory and statistical methods were used as the main examination methods of scientific research.

§ 2.2.1. General clinical and neurological examination methods

In January-February 2022, 102 randomly selected patients included in the study were treated with ACCD in the emergency neurology department of SBRSCEMC, and underwent a comprehensive clinical and neurological examination. A detailed collection of life anamnesis helped us to identify concomitant somatic diseases, his lifestyle and diet, and bad habits, which gave us initial knowledge about the genesis of ACCD. In the assessment of subjective complaints, attention was paid to their nature, size and strength. They were foundto have high blood pressure and excess weight.

The neurological status of the patients was studied in detail. It includes the severity of craniocerebral innervation deficiency, the movement system, the state of muscle tone, the degree of changes in tendon reflexes, pathological signs, coordination and sensory disorders, the study of the functions of the small pelvic organs, and disorders of higher nerve functions.

The Hunt-Hess scale (Appendix 2) is used to evaluate the severity of measure subarachnoid hemorrhage in patient with some sustemic ilnesses. It is broadly used in defining in inclusion of neurosurgical intervention of ilness.

When an aneurysm of the 1st and 2nd degree is detected, it is operated immediately.

≥ Grade 3 is treated conservatively until grade 2 or 1 is achieved.

Any life-threatening hematoma according to Hunt-Hess is immediately operated on at any level.

Original scale (Ye.I. Gusev, VI Skvorsova, 1991)

1. Level of consciousness disturbance: 0 – coma -III, 1 – coma -II, 2 – coma -I, 3 – sopor, 4 – numbness, 5 – clear;
2. Breathing type: 0 – apnea, 1 – gasping, 2 – atactic, 3 – group periodicity, apneic, 4 – Chain-Stock, 5 – regular hyperpnea, posthyperventilation apnea, 6 – norm;
3. Rigidity symptoms: 0 – stiffness of neck muscles, 1 – clearly expressed Kerning's symptom, Bekhterev's symptom, 2 – moderately expressed Kernig's symptom, 3 – normal;

4. Violation of oculocephalic reflexes: 0 - absent, 1 - general decrease, 2 - violation of the gaze reflex to the side, 3 - the phenomenon of "doll 's head", 4 - normal ;

5. Damage to the cranial nerves: 0 - absence of pupillary and corneal reflexes, inability to swallow and speak, 1 - floating, floating movements of the eyeball, vertical nystagmus, Hertwig-Majandi symptom, significant impairment of other cranial nerves; 2 – gaze paralysis, obvious horizontal nystagmus, central paralysis of 7, 12 pairs of nerves, 3 – moderate horizontal nystagmus, central paralysis of 7, 12 pairs of nerves, 4 – normal ;
6. Damage to the pyramidal tract: 0 - tetraplegia, 1 - para or hemiplegia, marked tetraparesis, 2 - marked para - or hemiparesis, moderate tetraparesis, monoplegia, 3-moderate para- or hemiparesis, severe monoparesis, 4 - minimal weakness of one limb, 5 - pyramidal signs without weakness, 6 - normal;
7. Changes in muscle tone: 0 - general hypo- or atony, 1 - atony of the legs or pathological extensor reflexes of the arms with weak flexion reaction , 2 - variable tone, hormetony, "decerebral rigidity" position, 3 - leg- flexor position of hands, 4 - average asymmetry position, 5 - norm;
8. Damage to the cerebellum: 0 - no coordinated movement, 1- moderately clear ataxia of the limbs, 2 - mild ataxia of the limbs, 3- decreased muscle tone, 4 - normal;

9. Disturbance of sensitivity: 0 - hemihypesthesia, 1 - hypesthesia of one leg orhand, "patch" type, 2 - normal;

10. Visual impairment: 0 - amaurosis on both sides, hemianopsia, 1 - decrease invisual acuity, partial narrowing of visual fields, 2 - normal;

11. Dysfunction of the pelvic organs: 0 - lack of control, 1 - imperative urge, 2 -urinary retention, 3 - norm;

12. Tissue trophic disorders: 0 - bedsores, 1 - dry skin, 2 - normal;

13. Disorders of higher nervous activity: 0 - gross sensory - motor aphasia, apraxia, agnosia, 1 - motor aphasia, incomplete understanding of speech, 2 - elements of motor aphasia, 3 - normal.

Scale Orgogozo J.M., 1986

1. Consciousness: coma - 0, stupor - 5, drowsiness - 10, normal - 15;
2. Speech communication: impossible - 0, difficult - 5, normal - 10;
3. Gaze paresis: fixation - 0, lack of gaze - 5, absent - 10;
4. Mimics (facial movements): paralysis - 0, paresis or normality - 5;
5. Raising the hand: impossible - 0, incomplete - 5, possible or normal - 0;
6. Hand movements: impossible - 0, slow - 5, skilled (dexterous) - 10, normal - 15;
7. Upper limb tone: increased or decreased - 0, normal - 5;
8. Leg raising (lower leg raising): impossible - 0, minimum - 5, resistance - 10,norm - 15;
9. Foot movement: foot drop - 0, minimum - 5, resistance or norm - 10;
10. Arm and leg muscle tone: increased or decreased - 0, normal - 5.

A self - care rating scale was used to assess patients' neurostatus and post- stroke complications (appendix 3).

The Scandinavian scale is used to assess the level of functional recovery in the acute period of stroke. Evaluation criterion: less than 50 - minimal recovery, 50 - 75 - satisfactory recovery, 76 - 95 - sufficient recovery, above 95 - full recovery.

1. Consciousness: normal - 6, somnolence - 4, drowsiness - 2, coma or stupor (onlyreaction to pain) - 0;
2. Orientation: aware of time, place and self – 6, two out of three characters saved – 4, one out of three characters saved – 2, complete disorientation – 0;
3. Speech: preserved - 10, limited pronunciation or understanding - 6, slightly impaired speech or understanding - 3, severely impaired speech

or understanding - 0;

4. Eye movements: no oculomotor disorders - 4, oculomotor disorders - 2, full gazeparalysis - 0;

5. Facial nerve paralysis: absent - 2, present - 0;

6. Walking: > 5 meters without support - 12, with the help of a cane - 9, with the help of another - 6, sitting without support - 3, in bed (chair) - 0;

7. Arm strength: preserved - 6, reduced - 5, lifts the arm in a bent position - 4, lifts by leaning on something - 2, completely paralyzed - 0;

8. Arm power: preserved - 6, reduced - 4, cannot punch - 2, paralysis - 0;

9. Leg strength: preserved - 6, can lift without bending at the knee joint - 5, lifts with bending at the knee joint - 4, lifts leaning on something - 2, paralysis - 0;

10. Strength of paws: no paralysis -2, paralyzed-0.

Glasgow scale (Teasdale G., Lennet B., 1974)

(Appendix 4).

The correlation between the Glasgow Coma Scale and mortality is very high. Between 3 and 8 points, the mortality rate is 60%; 9 to 12 - 2%; 15 points - 0% (D.R. Shtulman , N. N. Yakhno). Consciousness in coma is assessed according to the Glasgow scale: 15 points - clear consciousness, 14 - 13 points - moderate consciousness disturbance, 12-11 points - deep consciousness disturbance, 10 - 8 points - sopor, 7 - 6 points - 0 moderate coma, 5 - 4 points — deep coma, 3 points — terminal coma, brain death.

NIHSS scale (Adams HP Biller J. 1989) (Appendix 5).

The NIHSS (National Institute of Health Stroke scale) scale is widely used to objectively assess the level of clinical symptoms in cerebral strokes. With the help of this scale, the state of consciousness, vision, motor and sensory system, coordination disorders, gnosis and speech functions of the stroke patient is evaluated.

The rating is from 0 to 4 points, and the increase in the sum of points determines the severity of clinical symptoms. The lower the sum of points, the better the patient's condition, the higher the score, the worse. Grading of points: 0 - satisfactory condition, 3 - 8 - mild neurological disorders, 9 - 12 - moderate neurological disorders, 13-15 - severe neurological disorders, 16 -34 - severe neurological disorders disorders. Depending on the sum of points, the prognosis of the disease can also be estimated.If the sum of points is less than 10, the prognosis is good, and if it is more than 20, the prognosis is poor.

Barthel DW Scale, 1965 (Appendix 6).

Barthel's index of activities of daily living is used to determine the impairment of patients' vital functions. It is a highly validated scale recommended as the best tool for assessing independence in areas of daily living. The Barthel index consists of 10 items: personal hygiene, dressing, eating, getting out of bed and moving around the room, climbing stairs, taking a bath, going to the toilet, controlling bowel movements and urination. The scale is scored by summing the scores for each item. The patient's performance is usually evaluated for 24 - 48 hours. The results are interpreted as follows: the total score varies from 0 to 100 points: 0 - 20 - complete dependence; 21 - 60 - clear dependence; 61 - 90 - average dependence; 91 - 99 - easy addiction; 100 points - is considered completely independent in everyday life.

§ 2.2.2 . Laboratory methods of research

In the diagnosis of patients, according to the manual on emergency medical care (clinical protocol) recommended in 2018 by the Ministry of Health of the Republic of Uzbekistan, the Republican Scientific Center of Emergency Medicine, the Association of Emergency Medicine Doctors, the following laboratory tests were performed:

A. Mandatory: General blood analysis, blood clotting time, blood

glucose level, coagulogram.

B. Additional: ALT, AST, blood urea, creatinine, general urine analysis. Examination of cerebrospinal fluid by lumbar puncture in controversial cases. Also, coagulogram and iron, cyanocobalamin, folic acid and ferritin levels in the blood were studied to determine the risk factors for the development of ACCD in the research groups. Blood coagulogram includes indicators such as prothrombin time (PTV) and its derivatives, prothrombin index (PTI) and prothrombin coefficient (international normalized ratio, MNO), fibrinogen, activated partial thrombin time (ACHTV). These analyzes were carried out at the clinical laboratory of SBRSCEMC and KANILAB private diagnostic centers and clinics on COAX, BTS-350 (BioSystems), Mindray (BC-2300), Mindray Co.Ltd (KHR) MR-96A devices at the request of the researcher. In order to determine the risk factors of stroke in the studied population, a specific laboratory diagnosis in our work was to determine the quantitative content of iron, cyanocobalamin, folic acid and ferritin in the blood. In our scientific work on diagnosis (screening) and determining the effectiveness of our treatment, a specific laboratory diagnosis was the determination of the quantitative content of iron in the blood before and after treatment.

As we know, in the currently widely used classification, 3 levels of severityare distinguished according to the hemoglobin index [7]:

- light or I degree - hemoglobin index 110-90 g/l,
- moderate or II degree - hemoglobin index 89-70 g/l,
- severe or III degree - hemoglobin level below 70 g/l.

770 patients with acute cerebrovascular disorders treated in the emergency neurology department of the Surkhondarya Branch of the Republican Emergency Medical Research Center underwent standard laboratory tests and instrumental examinations were performed. General and biochemical blood analyzes of patients

were examined using COAX, BTS-350 (BioSystems), Mindray Co.Ltd (BA-88A, BC-2300), TDZ4-WS devices.

During the analysis of the indicators of anemia, the amount of iron, vitamin B_{12}, folic acid and ferritin in the blood was determined in 102 patients who were directly observed.

Folic acid (vitamin B_9) . Usually, the amount of vitamin B_9 is measured in nanograms per milliliter (ng/ml), and the norm is from 3 to 17 ng / ml [9;22-23- b]. Cobas 6000 device with electroluminescence detection (ECLIA) method was used for its detection. For this, the required amount (3-5 ml) of venous blood was taken from the patient and placed on the device, and the result was obtained automatically without human intervention.

Vitamin B_{12} (cyanocabalamin) is a vitamin that plays a key role in the formation of red blood cells, the functioning of the nervous system, the processesof cell and tissue exchange, and the synthesis of nucleic acids. Lack of vitamin B_{12} leads to the development of macrocytic anemia, in which the number of red blood cells in the blood decreases and the size of each of them increases (such cells are called macrocytes). Macrocytes have a shorter life span and an increased tendency to hemolysis (destruction), so they cannot fully supply organs and tissues with oxygen. Therefore, the blood taken from a vein (3 - 5 ml) is immediately placed in the Cobas 6000 device by electroluminescence detection (ECLIA) without allowing hemolysis, and the result is obtained automatically without human intervention.

Blood cyanocabalamin levels are measured in picograms per milliliter (pg/ml) and range from 193 to 982 pg/ml. Subnormal levels of vitamin B_{12} are clinically significant, but excess levels are usually uncontrolled [9; 21 s].

Iron is considered an irreplaceable element, it is part of hemoglobin, myoglobin, cytochromes, participates in a number of oxidation - reduction reactions and plays an important role in blood formation processes. An average human body contains about 3 - 4 g of iron (about 40 mg Fe/kg body weight in women and about 50 mg Fe/kg body weight in men). Most of this trace

element (60 % or more than 2 g) is in hemoglobin (Hb), about 9 % - in myoglobin, and about 1 % - in heme and non-heme enzymes. 5 – 30 % of iron is deposited in the reserve in association with ferritin protein and hemosiderin (1 Danielson BG, Geisser P., Schneider W., 1996) [3; 121-b] .

To determine the amount of iron in the blood of each of them, 3 ml of blood was taken on an empty stomach in the morning and spun in a centrifuge at 3000 revolutions per minute (TDZ4-WS) for 5 minutes. Take 500 μl of the separated blood serum reagent ("ASIYOMEDIKA" HumanGmbH reagent was used) and put 25 μl serum in a test tube (cuvette) for 15 minutes at room temperature. It is checked by absorption from the iron program (in the BA-88A analyzer).

Ferritin is the main intracellular storage form of iron in the body. Ferritin consists of a protein shell (apoferritin) surrounding the inner core, which contains iron hydroxide. One molecule of this protein can contain up to 4000 iron atoms. Ferritin is present in almost all cells of the body and stores iron in a form that is protected from body fluids and thus does not cause oxidative damage. Ferritin of hepatocytes and macrophages provides a supply of iron available for the synthesis of hemoglobin and other heme proteins. Blood serum contains a small amount of ferritin in proportion to the total iron reserves in the body. The study of ferritin levels in blood serum is used to diagnose and control iron deficiency or excess, differential diagnosis of anemia, and to monitor the development of tumor processes.

Also, ferritin is an important indicator of the state of iron reserves in the body (a drop below 30 ng/ml in an adult blood test indicates iron deficiency); it is abiomarker of inflammation. Determining the level of ferritin The ferritin test is used to assess the body's iron stores when iron deficiency or excess is suspected. The test is used to determine the type of anemia, that is, to distinguish between irondeficiency anemia and anemia of chronic disease.

Mindray Co.Ltd (KHR) MR-96A apparatus was used to determine ferritin. 3 - 4 ml of blood was taken from the patient in a test tube on an empty

stomach, placed in a centrifuge with 4000/min rotation and separated from blood serum for 5 minutes. Ferritin was checked by enzyme immunoassay method. 20 μl of serum was placed in a ferritin well, 100 μl of conjugation was poured on it and placed in a thermoshaker for 30 minutes. After that, it was washed 5 times with 350 μlwashing solution. After mixing well, take 100 μl of tmbz and put it in a dark place at room temperature for 15 minutes. Then it was measured by putting a stop reagent on it.

§ 2.2.3. Instrumental methods of research

According to the manual for emergency medical care (clinical protocol), the following instrumental examinations were performed: ECG, ophthalmoscopy, chest x-ray, MSCT.

According to the data collected from the questionnaires of the National Stroke Register, 1463 of the neuroimaging methods (24%) used MSCT, MRI in the diagnosis of patients, mainly in Altinsoy, Jarkurgan and Termiz districts. This method of identification was almost never used in Uzun and Sariosia districts, at SBRSCEMC was used MSCT 100%, ultrasound examination 85 %, electrocardiogamma 100 %. In 2018, all patients were subjected to general laboratory analyzes according to the specially developed manual for emergency medical care. All patients received standard treatment.

MSCT is a great diagnostic examination of the brain and can detect various diseases of the gray and white matter, as well as disorders of the surrounding tissues, meninges and blood vessels. Multispiral computed tomography was performed on the patients in the "SOMATOM Emotion" 6-section multispiral computed tomography of the "SIEMENS" (Germany) company. Magnetic resonance imaging was performed on the patients in the spin - echo mode according to the standard protocol of MRT - weighted - T1 examination, on the "Optima MR450w" tomograph with a magnetic field strength of 1.5T of the "SIEMENS" (Germany) company, lying on its back in the coronary projection.

The method is based on the measurement of the difference in the attenuation of X - ray radiation by tissues of different densities and processing

on a complex computer. Currently, X - ray computer tomography is the main method of examiningthe internal organs of a person using X - rays.

X - ray attenuation scale called Hounsfield scale is used for visual and quantitative assessment of the density of structures imaged by computer tomography (its visual reflection on the device monitor is a black-white image spectrum). Scale units ("densitometric indicators, English Hounsfield units") corresponding to the degree of attenuation of X – ray radiation by anatomical structures of the body range from -1024 to +3071, that is, 4096 attenuation numbers. The average value on the Hounsfield scale (0 HU) corresponds to the density of water, negative values of the scale correspond to air and fat tissue, and positive values correspond to soft tissue, bone tissue and denser such as metal. Attenuation values measured in practical manuals may vary slightly depending on the device and hardware.

Scanning mode: T1 and T2, FLAIR, FIR, transversal, sagittal and coronal planes. Scanning duration was 3 - 5 minutes with 2.5 - 3.0 mm reconstruction inspiral mode.

Qualitative presence of hyperdense (hemorrhagic) zones or foci between the brain parenchyma and membranes, ventricular tamponade, presence of cystic degenerations or leukomalacias in the periventricular area, diffuse white matter damage, their localization and nature, subcortical region and other head state of brain structures) and quantitative (brain tissue density assessment using the Hounsfield scale) brain changes were studied.

Ultrasound examination of brachiocephalic vessels. Duplex scanning (DS) was used for this ultrasound examination. DS was conducted at SBRSCEMC on the Chison Q - 8 device of the Kransbuchler (Germany) company with 2, 4 and 8 MHz frequency sensors. The study was carried out according to the generally accepted method: an ultrasound sensor lubricated with gel was applied to the neck area and moved alternately along the front, side and back surfaces of the neck. During the study, the condition of the common carotid artery, internal carotid artery, and external carotid artery of

both sides was evaluated, that is: the permeability of the vessels, the presence of atherosclerotic plaques, their size and structure, narrowing, developed deformations in the form of C and S. The study was carried out for 20-30 minutes.

§ 2.3. Treatment method and characteristics

In the design of the study, all patients were divided into 2 large groups: Group I - patients with ACCD with iron deficiency anemia; Group II - patients with ACCD without iron deficiency anemia. The clinical course of stroke in both groups was assessed using neurological scales and dynamically compared. According to the received treatment, each group of patients was divided into two subgroups: Group I - 1 subgroup and Group II - 1 subgroup - patients received only basic therapy; Group I, 2 subgroups and group II, 2 subgroups - patients received iron preparations according to the scheme against the background of the main therapy.

The main therapy, according to the type of stroke and the standard, included: correction of the function of vital organs in hemorrhagic stroke, hypotensive therapy for high blood pressure (APF inhibitors, B-blockers, calcium antagonists, ganglioblockers, saluretics) or, on the contrary, arterial blood pressure pressors, hemostatic therapy, proteolytic enzyme inhibitors, therapy against brain tumors, angiospasm curative and preventive therapy, anticonvulsants, neurotrophic drugs, antibiotic therapy, surgical treatment if necessary, etc.;

From the iron group, 5 ml of sucrose complex of iron (III) hydroxide (100 mg of iron (III) hydroxide) was administered slowly intravenously, initially diluted with 200 ml of 0.9% sodium chloride, daily for 10 days, then orally sent through: 1 capsule (Fersinol 50 mg Fe) 2 times for 2 months. We evaluated subjective feelings, somatic and neurological status, general condition indicators in the treatment dynamics of the studied patients. The results of the therapy was evaluated by scales (Original scale, self-care, Barthel, NIHSS, Scandinavian scale) on the first day and last hospital days.

§ 2.4 . Methods of statistical processing of the obtained material

Methods of the obtained research results based on the SPSS version 22 program, descriptive statistical indicators such as the absolute and relative (percentage) number of patients, average value, standard deviation were calculated to determine the quantitative reliability of the data. The following non - parametric criteria were used to compare groups of patients: the Wilcoxon test for comparing two dependent variables, the Mann-Whitney test for comparing two independent variables. A 2x2 random correlation table was used to compare the occurrence of binary characters in two independent groups with the calculation of Pearson's x^2 - *squared test.* Results were considered statistically significant at $p<0.05$.

Summary for CHAPTER II .

The research material consisted of 122 people, of whom 20 (16.4%) belonged to the control group, healthy, without neurological complications, and 102 (83.6%) patients - the main group with the diagnosis of ACCD. The study was conducted in the Surkhandarya branch of the Republican Scientific Center of Emergency Medical Care, as well as in sub-branches in 2018-2022. Diagnosis of "acute cerebral circulation disorder" according to the criteria of ICD-10 (1995), 8 BD- 8BIZ (I61, I61.0-I61.6 I61.9, I63.0- Heading I63.9) - established by hemorrhagic stroke. Patients in the comparison group were divided into 2 groups according to the genesis of development: Group I - hemorrhagic stroke patients with iron deficiency anemia; Group II - patients with hemorrhagic stroke without iron deficiency anemia. The main research methods were: study of clinical and paraclinical research methods. A clinical study was conducted to evaluate the general somatic (subjective and objective complaints, Barthel index), neurological (Original scale, self-care, Barthel, NIHSS, Scandinavian scale) condition of patients with ACCD. Paraclinical research consisted of instrumental (MSCT, brachiocephalic ultrasound) and laboratory (coagulogram and determination of iron, ferritin, vitamin B_{12} and

folic acid in blood serum). statistically processed on the basis of SPSS version 22 program for Microsoft Office Excel-2007 personal computer.

CHAPTER III. CLINICAL-EPIDEMIOLOGICAL, NEUROLOGICAL AND PARACLINICAL DESCRIPTION OF PATIENTS WITH HEMORRHAGIC STROKE

§ 3.1. Results of the national stroke registry in Surkhandarya region

According to the questionnaires of the National Stroke Register, the statistics department of the regional health department, the registration of hemorrhagic strokes in the region in 2018-2022 was as follows:

there are statistically significant differences in the number of patients in the context of years in 3 districts of Surkhandarya region. Thus, there are significant differences between the city of Termiz, Sariossia, Sherabad districts in 2020 and 2021 (due to COVID-19) when the incidence of hemorrhagic stroke increased dramatically. In 2020-2021, the number of hemorrhagic stroke patients is much higher than in 2018, 2019 and 2022 (x^2 =3.87 r<0.05). The sharp increase in the incidence of hemorrhagic stroke in 2020 is explained by the fact that the majority of patients with Covid-19 developed hemorrhagic stroke after some time.

According to the registry questionnaires, 3896 patients coincided with the period of the pandemic (from March 2019 to 2020) received inpatient treatment, while 931 received home care and outpatient care (mainly in Uzun, Boysun, Kyziqirqiq, Jarkurgan districts) and especially home treatment. After the disease, 83% (n=5060) patients survived, 17 % (n=1036) died. Most of the deceased are from Angor, Sho‘rchi, Denov, Kumkurgan, Altinsoy, Muzrabot, Uzun districts. The main statistical indicators of stroke in Surkhandarya region for these years are presented in detail in Table 3.1.

The main statistical indicators of stroke in Surkhandarya

Table 3.1

Year / Indications	2018-year	2019-year	2019-year	2019-year	2019-year	Total
Number of general people	2569904	2629135	2680800	2681000	2743200	13304039
Number of general stroke	4876	5449	5524	5476	2911	24236
Lethality	21%	22%	25%	21%	19%	17%
Death rate	0,39	0,46	0,52	0,43	0,2	0,31
Illness	1,9	2	2	2	1	1,8

Interesting data were obtained on the relationship of stroke incidence to gender. 49 % of the total hemorrhagic stroke index corresponded to women and 51 % to men. However, in terms of percentage, among 40 – 44 – year - olds, it was more common in women, while in other groups, the number of men prevailed. Only in the group under 39 years of age, the number of women and men is almost the same, and men have 1 more. It is interesting to note that according to the data provided by the regional statistical center, the number of women in the region was 15,679 more than men during these years. In the section of districts, only in Uzun district more number of women patients with general stroke was recorded, while in all other districts the number of men prevailed over women. According to the analysis of the questionnaires, 707 patients had a history of 1 stroke, 207 patients had 2 strokes, 52 patients had 3 or more strokes, and for one reason or another, the stroke was repeated. In 5130 patients, an acute cerebral blood circulation disorder occurred for the first time.

As we know, hemorrhagic stroke is divided into intracerebral hemorrhage and subarachnoid hemorrhage [15; p. 159]..

The analysis of the above data showed that stroke is common among the population aged 45 to 74 years, and these rates are increasing among young people.

Districts with higher levels of heavy metal pollution had higher rates of stroke, and death rates were higher in districts with little or no use of neuroimaging methods.

§ 3.2 Structural dynamic analysis of stroke in Surkhandarya region

The distribution of strokes by types in the region was determined based on the results of the registry questionnaires and the results of the MSCT analysis of patients treated at SBRSCEMC.

According to the analysis according to the classification of each type of stroke, hemorrhagic stroke occurred in 12% (n=732) of patients with hemorrhagic stroke in the ventricles of the brain, subarachnoid in 22% (n=1341) and in 66% (n=4023) parenchymatous hemorrhage was observed.

According to the structural analysis of hemorrhagic stroke in the region, parenchymatous hemorrhage in 2018 was observed the most in Sarysia and Kumkurgan districts. The ratio of subarachnoid, cerebral ventricular hemorrhage and parenzymatous hemorrhage was 1:2:5 (Fig. 3.1).

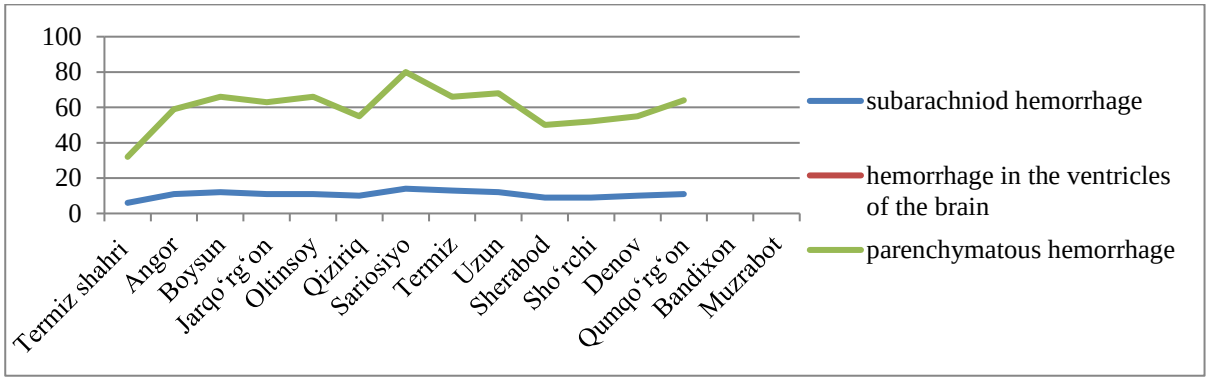


Fig. 3.1 Analysis of hemorrhagic stroke by types (2018)

For 2018, there were no statistically significant differences between the types of hemorrhagic stroke in the conditions of the Surkhandarya region districts.

Analysis of hemorrhagic stroke by types (2018) Table 3.2

Districts / Subtypes	Subarachnoid hemorrhage (n=abs)	Ventricular hemorrhage (n=abs)	Parenchymal hemorrhage (n=abs)	x^2
Termiz city	6	1 1	32	$\chi^2 = 0.03$ r > 0.05
Angor	1 1	19	59	$\chi^2 = 0.02$ r > 0.05
Boysun	1 2	2 1	66	$\chi^2 = 0.01$ r > 0.05
Jarkurgan	11	21	63	$\chi^2 = 0.02$ r > 0.05
Oltinsoy	11	21	66	$\chi^2 = 0.05$ r > 0.05
Qiziriq	10	18	55	$\chi^2 = 0.002$ r > 0.05
Sariosiyo	14	2 6	80	$\chi^2 = 0.007$ r > 0.05
Termiz	1 3	20	66	$\chi^2 = 0, 2$ r > 0.05
Uzun	12	22	68	$\chi^2 = 0.003$ r > 0.05
Sherabod	9	17	5 0	$\chi^2 = 0.025$ _ r > 0.05
Sho‘rchi	9	1 7	5 2	$\chi^2 = 0.01$ r > 0.05
Denov	10	18	55	$\chi^2 = 0.002$ r > 0.05
Kumkurgan	11	21	64	$\chi^2 = 0.02$ r > 0.05
Bandikhon*				
Muzrabod	9	16	49	$\chi^2 =0.004$ r >0.05
Total	148	268	825	

*- *Bandikhon district was established in 2019.*

Analysis of hemorrhagic stroke by types (2019) Table 3.3

Districts / subtypes	Subarachnoid hemorrhage (n=abs)	Ventricular hemorrhage (n=abs)	Parenchymatous hemorrhage (n=abs)	χ^2
Termiz city	7	12	39	χ^2 = 0.04 r > 0.05
Angor	12	22	66	χ^2 = 0.003 r > 0.05
Boysun	13	23	71	χ^2 = 0.008 r > 0.05
Jarkurgan	12	23	68	χ^2 = 0.02 r > 0.05
Oltinsoy	13	23	69	χ^2 = 0.02 r > 0.05
Qiziriq	10	19	57	χ^2 = 0.01 r > 0.05
Sariosiyo	14	27	81	χ^2 = 0.03 r > 0.05
Termiz	13	22	70	χ^2 = 0.05 r > 0.05
Uzun	13	22	69	χ^2 = 0.04 r > 0.05
Sherabod	9	17	50	χ^2 = 0, 01 r > 0.05
Sho‘rchi	11	20	61	χ^2 = 0.001 r > 0.05

Denov	11	21	63	χ^2 = 0.014 r > 0.05
Kumkurgan	12	22	65	χ^2 = 0.015 r > 0.05
Bandikhon	7	13	40	χ^2 = 0.006 r >0.05
Muzrabod	9	17	52	χ^2 =0, 9 r >0.05
Total	166	303	921	

For 2019, there were no statistically significant differences between thetypes of hemorrhagic stroke in the conditions of the districts of the Surkhandarya region. According to the structural analysis of hemorrhagic strokes in the region, parenchymatous hemorrhages in 2019 were observed most in Sariosia and Kumkurgan districts. The ratio of subarachnoid, cerebral ventricles and parenzymatous hemorrhage was 1:2:5 (Fig. 3.2).

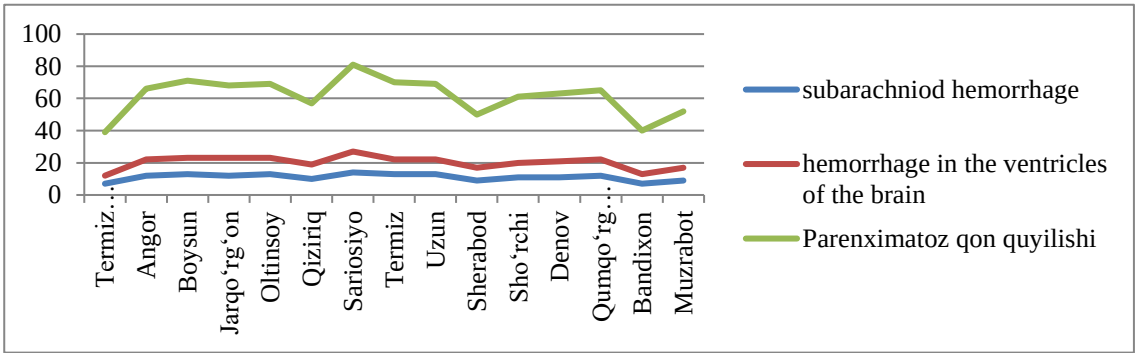


Figure 3.2. Analysis of hemorrhagic stroke by type (2019)

According to the structural analysis of hemorrhagic stroke in the region, parenchymatous hemorrhage in 2020 was observed most often in Sariosia and Kumkurgan districts. The ratio of subarachnoid, cerebral ventricles and parenzymatous hemorrhage was 1:2:5 (Fig. 3.3).

For 2020, there were no statistically significant differences between the types of hemorrhagic stroke in the conditions of the districts of the Surkhandarya region.

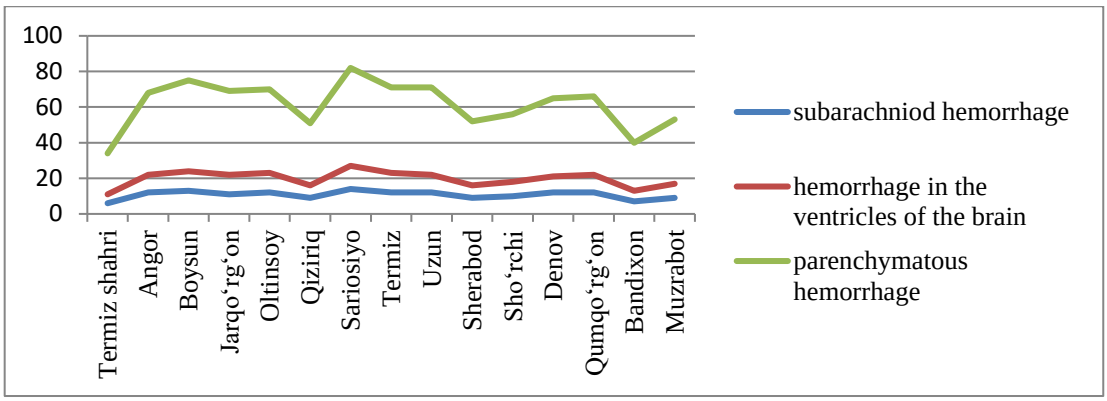


Figure 3.3. Analysis of Hemorrhagic Stroke by Type (2020)

Analysis of hemorrhagic stroke by types (2020) Table 3.4

Districts / Subtypes	Subarachnoid hemorrhage (n=abs)	Ventricular hemorrhage (n=abs)	Parenchymal hemorrhage (n=abs)	χ^2
Termiz city	6	11	34	χ^2 = 0.002 r > 0.05
Angor	12	22	68	χ^2 = 0.003 r > 0.05
Boysun	13	24	75	χ^2 = 0.001 r > 0.05
Jarkurgan	11	22	69	χ^2 = 0.06 r > 0.05
Oltinsoy	12	23	70	χ^2 = 0.01 r > 0.05
Qiziriq	9	16	51	χ^2 = 0.01 r > 0.05
Sariosiyo	14	27	82	χ^2 = 0.015 r > 0.05
Termiz	12	23	71	χ^2 = 0.03 r > 0.05

Uzun	12	22	71	χ^2 = 0.02 r > 0.05
Sherabod	9	16	52	χ^2 = 0, 0 2 r > 0.05
Sho‘rchi	10	18	56	χ^2 = 0.007 r > 0.05
Denov	12	21	65	χ^2 = 0.04 r > 0.05
Kumkurgan	12	22	66	χ^2 = 0.03 r > 0.05
Bandikhon	7	13	40	χ^2 = 0.001 r >0.05
Muzrabod	9	17	53	χ^2 = 0.003 r >0.05
Total	160	297	923	

Analysis of hemorrhagic stroke by types (2021)

Table 3.5

Districts / Subtypes	Subarachnoid hemorrhage (n=abs)	Ventricular hemorrhage (n=abs)	Parenchymal hemorrhage (n=abs)	χ^2
Termiz city	6	11	35	χ^2 = 0.003 r > 0.05
Angor	12	22	66	χ^2 = 0.04 r > 0.05
Boysun	12	22	70	χ^2 = 0.005 r > 0.05
Jarkurgan	11	22	69	χ^2 = 0.05 r > 0.05
Oltinsoy	13	23	70	χ^2 = 0.06 r > 0.05

Qiziriq	9	16	50	χ^2 = 0.015 r > 0.05
Sariosiyo	14	27	83	χ^2 = 0.011 r > 0.05
Termiz	12	22	71	χ^2 = 0.018 r > 0.05
Uzun	12	22	72	χ^2 = 0.04 r > 0.05
Sherabod	9	16	53	χ^2 = 0, 0 4 r > 0.05
Sho‘rchi	9	18	55	χ^2 = 0.003 r > 0.05
Denov	10	19	60	χ^2 = 0.01 r > 0.05
Kumkurgan	12	22	67	χ^2 = 0.02 r > 0.05
Bandikhon	7	13	39	χ^2 = 0.02 r >0.05
Muzrabod	9	17	52	χ^2 = 0.005 r >0.05
Total	157	292	912	

For 2021, no statistically significant differences were observed between the types of hemorrhagic stroke in the conditions of the districts of the Surkhandarya region. According to the structural analysis of hemorrhagic stroke in the region, parenchymatous hemorrhage in 2021 was observed the most in Sariosia and Kumkurgan districts. The ratio of subarachnoid, cerebral ventricles and parenzymatous hemorrhage was 1:2:5 (Fig. 3.4).

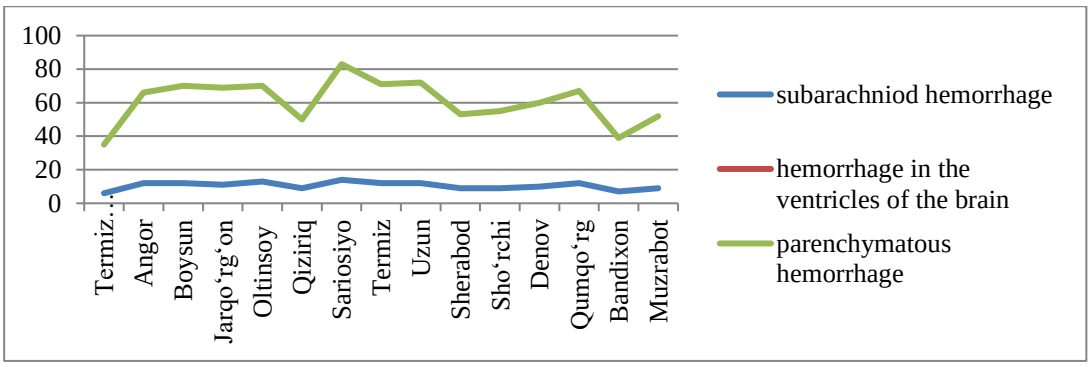


Figure 3.4. Analysis of Hemorrhagic Stroke by Type (2021)

According to the structural analysis of hemorrhagic strokes in the region, parenchymatous hemorrhages were observed most often in Sariosia and Kumkurgan districts. The ratio of subarachnoid, cerebral ventricles and parenzymatous blood flow was 1:2:5 (Fig. 3.5).

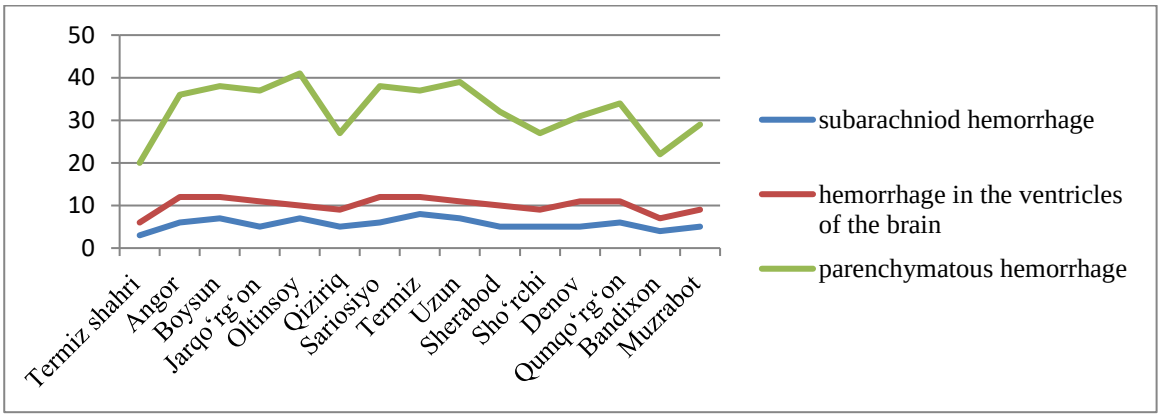


Figure 3.5. Analysis of Hemorrhagic Stroke by Type (2022)

Analysis of hemorrhagic stroke by types (2022) Table 3.6

Districts / subtypes	Subarachnoid hemorrhage (n=abs)	Ventricular hemorrhage (n=abs)	Parenchymal hemorrhage (n=abs)	χ^2
Termiz city	3	6	20	$\chi^2 = 0.05$ $r > 0.05$
Angor	6	12	36	$\chi^2 = 0.05$ $r > 0.05$
Boysun	7	12	38	$\chi^2 = 0.025$ $r > 0.05$

Jarkurgan	5	11	37	χ^2 = 0.25 r > 0.05
Oltinsoy	7	10	41	χ^2 = 0.46 r > 0.05
Qiziriq	5	9	27	χ^2 = 0.04 r > 0.05
Sariosiyo	6	12	38	χ^2 = 0.04 r > 0.05
Termiz	8	12	37	χ^2 = 0.3 r > 0.05
Uzun	7	11	39	χ^2 = 0.1 r > 0.05
Sherabod	5	10	32	χ^2 = 0, 0 4 r > 0.05
Sho‘rchi	5	9	27	χ^2 = 0.04 r > 0.05
Denov	5	11	31	χ^2 = 0.17 r > 0.05
Kumkurgan	6	11	34	χ^2 = 0.01 r > 0.05
Bandikhon	4	7	22	χ^2 = 0.01 r >0.05
Muzrabod	5	9	29	χ^2 = 0.001 r >0.05
Total	84	152	488	

For the first 6 months of 2022, no statistically significant differences were observed between the types of hemorrhagic stroke in the conditions of the districts of Surkhandarya region.

§ 3.3 . Dynamic analysis of laboratory indicators and results

In all districts of Surkhandarya region and in the city of Termiz, routine analysis (total blood and total urine analysis) and blood biochemical

analysis results of one or another degree of anemia were found in all districts, and hemorrhagic stroke was found in the regions with the lowest hemoglobin level.

Results of general blood analysis (2018) Table 3.7

Indicator / Region	Hemo globin (120-160 120-140 g/l) M±m	Erythro cells (4.0-5.0 x 10^{12} /l) M±m	Color index (0.85-1.05) M ± m	Thrombo sites (180-320 x 10^{9} / l) M±m	Leyko sites (4.0-9.0 x 10^{12} / l) M±m	EEC (2-10 2-15 mm / s) M ± m
Termiz city	1 10 .5 ±8 .3	2.7 ± 0.68	0.8 5± 0.07	180 .5 ± 15.2	8.6 ± 1.9 _	7.1 ± 3.9 _
Angar	88 .2 ± 4.1	2.5 ± 0.45	0.7 8± 0.06	170 .5 ± 13.8	9 .8 ± 1.6	8.4 ± 2.2 _
Boysun	89 .1 ± 3.2	3.0 ± 0.57	0.8 2± 0.05	175,2 ± 9.8 _	8.1 ± 2.5 _	9.4 ± 2.9 _
Jarkurgan	88 .6 ± 3.5	3.2 ± 0.34	0.73 ± 0.04	160 .5 ± 18.1	6.3 ± 1.2 _	10 ± .34.9
Oltinsoy	89 .9 ± 3.9	4.0 ± 0.39	0.70 ± 0.08	150.9 ± 12.9	9.7 ± 2.1	9.7 ± 3.1
Qiziriq	90 .8 ± 4.1	3.1 ± 0.28	1.0 ± 0.11	138.3 ± 8.8	8.4 ± 2.3	6.8 ± 2.4
Sariosiyo	8 8 .3 ± 3.4	3, 6 ± 0.31	0.78 ± 0.05	150.2 ± 14.1	7.6 ± 1.8	8.2 ± 2.5
Termiz	9 5 .8 ± 5.2	4.0 ± 0.41	0.8 8± 0.09	178.6 ± 15.8	10.4 ±3.5	7.6 ±1 , 3
Uzun	86.4 ± 6.0	3.0 ± 0.45	0.75 ± 0.05	160.4 ± 13 , 9	8.8 ± 2.7	5.8 ± 2.0 _
Sherabod	100.7 ± 7.2	4.1 ± 0.62	0.89 ± 0.05	159.8 ± 8.3	9.8 ± 3.0	9.9 ± 3.4
Sho‘rchi	90.2 ± 5.8	2.7 ± 0.27	0.81 ± 0.03	185.4 ± 7.9	6.7 ± 1.1	7.1 ± 1.9

Denov	112.1 ± 7.3 _	4.5 ± 0.42	0.9 5± 0.08	200.5 ± 13.2	8.5 ± 1.8	11.4 ±5.9
Kumkurgan	86.6 ± 4.1	2.9 ± 0.3	0.8 ± 0.07	189.4 ± 16.1	7.2 ± 1.9	9.5 ± 4.2
Muzrabod	90 .4 ± 5.2	3.5 ± 0.46	0.8 5± 0.08	180.3 ± 9.4	6.9 ± 0.9	14.4 ±6.1

In 2018, the amount of hemoglobin in the general blood analysis of patients in Sariosia, Uzun, Kumko‘rgan districts was much lower than the norm, corresponding to grade II-III anemia. It is in these regions that strokes were recorded more this year. It can be seen that there is an inverse proportion between the degree of stroke and hemoglobin and color indicators.

Results of general blood analysis (2019) Table 3.8

Indicator / Region	Hemoglobin (120-160 120-140 g/l) M±m	Erythrocytes (4.0-5.0 x 10^{12}/l) M±m	Color indicator (0.85-1.05) M±m	Platelets (180-320 x 10^{9} / l) M±m	Leukocytes (4.0-9.0 x 10^{12} / l) M±m	EEC (2-10 2-15 mm / s) M±m
Termiz city	1 11.6 ± 11.4 _	4.8 ± 0.41	0.8 5± 0.08	180.4 ±18.3	8.4 ± 1.6	7.5 ± 0.9
Angar	92.4 ± 4.7 _ _	2.5 ± 0.92	0.8 ± 0.1	170.3 ±13.7	9.4 ± 2.1	8.9 ± 1.2
Boysun	89,6 ± 7,3 _ _	3.0 ± 0.91	0.8 ± 0.09	175 .9 ± 12.5	8.3 ± 1.8 _	9 .8 ± 0. 9
Jarkurgan	95,2 ± 4,1 _ _	3.2 ± 0.42	0.85 ± 0.1	160 .5 ± 8.4	6.3 ± 1.9 _	10.3 ± 1.2 _
Oltinsoy	89,3 ± 3,9 _ _	4.0 ± 0.85	0.9 ± 0.21	150 .6 ± 14.1	9.8 ± 2.1 _	9 .5 ± 0. 9
Qiziriq	96 .5 ± 6.8	3.1 ± 0.52	1.0 ± 0.05	138 .5 ± 10.1	8.2 ± 1.4 _	6.5 ± 1.0 _
Sariosiyo	89 .1 ± 9.1	3.0 ± 0.67	0.9 ± 0.09	150.3 ± 9.4	7.9 ± 1.8	8.6 ± 2.1

Termiz	85 .8 ± 7.7	2.9 ± 0.49	0.78 ± 0.1	178.4 ± 8.9	10.6 ± 2.1	7.6 ± 1.2
Uzun	86.8 ± 7.1	3.0 ± 0.58	0.75 ± 0.2	160.2 ± 11.2	8.7 ± 2.3	5.9 ± 0.8
Sherabod	10 5.3 ± 9.2 _	4.1 ± 0.82	0.90 ± 0.07	159.3 ±12.7	9.8 ± 1.4	9.3 ± 1.3
Sho‘rchi	9 8 .1 ± 4.3	2.7 ± 0.49	0.8 4± 0.08	185.1 ± 9.9	6.9 ± 1.3	7.5 ± 1.3
Denov	106 .8 ± 14.1	5.0 ± 0.53	0.9 0 ± 0.09	200.3 ±10.6	8.5 ± 2.0	11.9 ±2.1
Kumkurgan	86.4 ± 6.7	2.9 ± 0.58	0.8 ± 0.08	189.9 ± 9.5	7.3 ± 1.5	9.9 ± 1.5
Bandi Khan	8 9 .2 ± 5.9	2.9 ± 0.46	0.9 ± 0.09	175.4 ±13.2	5.4 ± 0.9	12.4 ±1.7
Muzrabod	95 .8 ± 10.3	2.5 ± 0.39	0.8 ± 0.15	180.5 ± 7.4	6.3 ± 1.1	14.5 ±2.6

In 2019, the hemoglobin content of patients in the general blood analysis was much lower than the norm in Sariosia, Uzun, Termiz and Boysun districts, corresponding to grade II-III anemia. Hemorrhagic strokes are more likely to be recorded in these areas this year.

Results of general blood analysis (2020) (averaged) Table 3.9

Indicator / Region	Hemoglobin (120-160 120-140 g/l) M±m	Erythrocytes (4.0-5.0 x 10 12 /l) M±m	Color indicator (0.85-1.05) M±m	Platelets (180-320 x 10 9 / l) M±m	Leukocytes (4.0-9.0 x 10 12 / l) M±m	EEC (2-10 2-15 mm / s) M±m
Termiz city	1 15.5 ± 16.4 _	2.7 ± 0.53	0.8 ± 0.09	180 ± 10.3	8.4 ± 1.9	7.5 ±0.4
Angar	88.3 ± 10.1	2.5 ± 0.62	0.7 ± 0.06	170 ± 12.4	9.2 ± 1.3	8.4 ±0.5
Boysun	90.3 ± 9.3	3.0 ± 0.48	0.8 ± 0.09	175 ± 9.8	8.6 ± 1.5	9.3 ±0.5

Jarkurgan	88.9 ± 10.6	3.2 ± 0.42	0.6 ± 0.05	160 ± 8.5	6.4 ± 0.9	10.8 ±0.6
Oltinsoy	90.6 ± 9.6	4.0 ± 0.7	0.9 ± 0.1	150 ± 7.4	9.3 ± 0.8	9.6 ±0.7
Qiziriq	96 .3 ± 8.7	3.1 ± 0.34	1.0 ± 0.12	138 ± 6.9	8.2 ± 1.0	6.3 ±0.5
Sariosiyo	8 5 .8 ± 9.4	3.0 ± 0.28	0.9 ± 0.11	150 ± 7.9	7.7 ± 1.2	8.2 ±0.8
Termiz	90.8 ± 7.9	2.9 ± 0.32	0.8 ± 0.06	178 ± 10.1	10.6 ± 0.9	7.8 ±0.9
Uzun	86.5 ± 7.9	3.0 ± 0.34	0.75 ± 0.05	160 ± 9.4	8.7 ± 0.8	5.7 ±0.3
Sherabod	110.5 ± 14.6 –	4.1 ± 0.48	0.69 ± 0.04	159 ± 7.8	9.4 ± 1.2	9.4 ±0.7
Sho‘rchi	90.3 ± 6.9	2.7 ± 0.28	0.81 ± 0.05	185 ± 8.1	6.3 ± 0.7	7.1 ±0.6
Denov	89.9 ± 9.2	2.5 ± 0.3	0.9 ± 0.1	200 ± 10.5	8.5 ± 0.6	11.4 ±1.1
Kumkurgan	86.6 ± 6.6	2.9 ± 0.38	0.8 ± 0.08	189 ± 8.4	7.1 ± 0.9	9.5 ±1.0
Bandi Khan	88.1 ± 5.9	2.9 ± 0.23	0.9 ± 0.08	175 ± 7.4	5.3 ± 0.8	12.6 ±1.4
Muzrabod	80.5 ± 6.3	2.5 ± 0.27	0.8 ± 0.1	180 ± 6.9	6.6 ± 0.5	14.1 ±1.6

In 2020, the hemoglobin content of patients in the general blood analysis was much lower than the norm in Sariosia and Uzun districts, and proportionally more hemorrhagic stroke were recorded in these regions.

Results of general blood analysis (2021) (averaged) Table 3.10

Indicator / Region	Hemoglobin (120-160 120-140 g/l) M±m	Erythrocytes (4.0-5.0 x 10 12 /l) M±m	Color indicator (0.85-1.05) M±m	Platelets (180-320 x 10 9 / l) M±m	Leukocytes (4.0-9.0 x 10 12 / l) M±m	EEC (2-10 2-15) mm / s M±m
Termiz city	102.1 ± 12.3	2.7 ± 0.12	0.8 ± 0.07	180.1 ± 15.1	8.4 ± 0.9	7.2 ±0.5
Angar	90 .8 ± 9.6	5.0 ± 0.62	0.7 ± 0.09	170.5 ± 14.1	9.1 ± 1.2	8.1 ±0.7
Boysun	88 .9 ± 11.2	3.0 ± 0.12	0.8 ± 0.1	175.2 ± 17.2	8.8 ± 1.0	9.8 ±1.0
Jarkurgan	88.5 ± 7.5	3.2 ± 0.11	0.6 ± 0.05	160.6 ± 13.9	6.8 ± 0.8	10.8 ±1.2
Oltinsoy	87 .7 ± 5.7	4.0 ± 0.38	0.9 ± 0.12	150.3 ± 13.8	9.7 ± 1.4	9.4 ±0.9
Qiziriq	99 .2 ± 9.1	3.1 ± 0.4	1.0 ± 0.08	138.8 ± 10.7	8.1 ± 1.2	6.3 ±0.7
Sariosiyo	8 5 .1 ± 7.2	3.0 ± 0.36	0.9 ± 0.14	150.9 ± 17.9	7.9 ± 0.9	8.8 ±0.5
Termiz	90.2 ± 8.2	2.9 ± 0.13	0.8 ± 0.09	178.7 ± 21.4	10.7 ± 0.7	7.4 ±0.7
Uzun	86.8 ± 6.4	3.0 ± 0.25	0.75 ± 0.11	160.9 ± 17.1	8.4 ± -0.9	5.8 ±0.8
Sherabod	1 12 .6 ± 12.4	4.1 ± 0.32	0.69 ± 0.07	159.6 ± 12.8	9.4 ± 1.4	9.1 ±1.3
Sho‘rchi	9 7 .4 ± 8.2	2.7 ± 0.21	0.81 ± 0.09	185.2 ± 14.2	6.2 ± 0.8	7.7 ±1.1
Denov	118 .3 ± 12.1	2.5 ± 0.18	0.9 ± 0.13	200.1 ± 24.6	8.1 ± 1.3	11.3 ±2.1
Kumkurgan	86.6 ± 8.4	2.9 ± 0.25	0.8 ± 0.08	189.9 ± 19.»	7.8 ± 0.8	9.5 ±1.6

Bandi Khan	92 .2 ± 7.2	2.9 ± 0.34	0.9 ± 0.1	175.6 ± 14.5	5.7 ± 0.7	12.2 ± 1.4
Muzrabod	95 .1 ± 7.7	2.5 ± 0.41	0.8 ± 0.1	180.4 ± 19.3	6.7 ± 0.4	14.8 ±2.3

In 2021, the hemoglobin content of the patients in the general blood analysis was much lower than the norm in Sariosiyo, Uzun, Oltinsoy and Boysun districts, corresponding to grade II-III anemia. Hemorrhagic strokes are more likely to be recorded in these areas this year.

Results of general blood analysis (2022) Table 3.11

Indicator / Region	Hemoglobin (120-160 120-140 g/l) M±m	Erythrocytes (4.0-5.0 x 10 12 /l) M±m	Color indicator (0.85-1.05) M±m	Platelets (180-320 x 10 9 / l) M±m	Leukocytes (4.0-9.0 x 10 12 / l) M±m	EEC (2-10 2-15 mm / s) M±m
Termiz city	111.5 ± 12.4 –	2.7 ± 0.41	0.8 ± 0.08	180.5 ± 19.2	8.4 ± 0.9	7.9 ±0.8
Angar	88.5 ± 9.5	2.5 ± 0.32	0.7 ± 0.08	170.3 ± 13.8	9.3 ± 1.2	8.6 ±1.1
Boysun	90.3 ± 11.5	3.0 ± 0.28	0.8 ± 0.13	175.5 ± 16.8	8.2 ± 1.1	9.1 ±1.4
Jarkurgan	88.6 ± 10.2	3.2 ± 0.39	0.6 ± 0.08	160.1 ± 14.3	6.9 ± 0.8	10.3 ±1.6
Oltinsoy	85 .6 ± 7.8	4.0 ± 0.52	0.9 ± 0.13	150.9 ± 13.9	9.2 ± 1.4	9.9 ±0.8
Qiziriq	98 .3 ± 10.3	3.1 ± 0.43	1.0 ± 0.21	138.5 ± 12.3	8.5 ± 0.9	6.5 ±0.8
Sariosiyo	89.6 ± 6.8	3.0 ± 0.39	0.9 ± 0.19	150.8 ± 12.1	7.3 ± 1.0	8.2 ±0.9
Termiz	90.2 ± 10.0	2.9 ± 0.40	0.8 ± 0.11	178.7 ± 19.2	10.2 ± 1.21	7.6 ±0.9

Uzun	86.3 ± 8.9	3.0 ± 0.37	0.75 ± 0.1	160.1 ± 17.5	8.8 ± 1.2	5.3 ±0.7
Sherabod	1 19 .8 ± 12.4	4.1 ± 0.51	0.69 ± 0.08	159.9 ± 12.8	9.2 ± 1.4	9.8 ±1.3
Sho‘rchi	90.9 ± 11.8	2.7 ± 0.41	0.81 ± 0.11	185.7 ± 16.4	6.2 ± 0.8	7.3 ±0.6
Denov	115 .4 ± 13.4	2.5 ± 0.26	0.9 ± 0.13	200.4 ± 17.2	8.5 ± 0.9	11.4 ±1.6
Kumkurgan	92 .3 ± 11.5	2.9 ± 0.38	0.8 ± 0.09	189.2 ± 18.2	7.8 ± 0.8	9.3 ±1.4
Bandikhan	96 .4 ± 12.3	2.9 ± 0.45	0.9 ± 0.13	175.1 ± 12.5	5.5 ± 0.7	12.7 ±2.0
Muzrabod	99 .3 ± 8.4	2.5 ± 0.36	0.8 ± 0.18	180.4 ± 21.7	6.3 ± 0.8	14.3 ±2.5

In 2022, the hemoglobin content of the patients in the general blood analysis was much lower than the norm in Oltinsoy, Sariosiyo, Uzun, Termiz and Boysun districts, corresponding to grade II-III anemia. Hemorrhagic strokes are more likely to be recorded in these areas this year.

Average dynamics of general blood analysis indicators Table 3.12

Years / Indicators	2018	2019	2020	2021	2022
Hemoglobin (120-160; 120-140 g/l)	96.13	94.06	83.6	89.4	95.7
			$\chi^2 = 3.92$ r<0.05		
Erythrocytes (4.0-5.0x 10^{12} /l)	3.3	3.8	2.8	2.9	3.5
			$\chi^2 = 1.4$ r>0.05		
Color index (0.85-1.05)	0.87	0.85	0.81	0.81	0.88
			$\chi^2 = 2.4$ r>0.05		
Platelets (180-320x10^9 /l)	210.5	235.2	195.3	188.9	224.4
			$\chi^2 = 4.3$ r<0.05		
Leukocytes (4.0-9.0x10^{12} /l)	6.8	7.6	6.3	6.9	8.3
			$\chi^2 = 2.5$ r>0.05		
EC (2-102-15 mm/s)	12.3	10.6	17.5	15.4	8.2

			$\chi^2 = 4.12$ r<0.05	

For the years 2020-2021, hemogram indicators such as hemoglobin, platelets and erythrocyte sedimentation rate had significant differences compared to the same indicators in 2018, 2019 and 2022 (x^2 =3.92 r <0.05; x^2 =4, 3 r< 0.05; χ120, p<, respectively), which shows the effect of coronavirus infection in 2020 and 2021.

In the biochemical analyzes of blood, significant changes were not detected and this is described in the tables in the appendix (tables 3.18-3.21).

§ 3.4. Main risk factors of hemorrhagic stroke in Surkhandarya region and a dynamic analysis

The main risk factors are arterial hypertension 90% (n=5486), smoking 24% (n=1463), heart disease 40 % (n=2438), arrhythmia 22% (n=1341), myocardial infarction 11 % (n =670), dyslipoproteinemia 29 % (n=1768), diabetes 38% (n=2316), genetic predisposition 42 % (n=2560), anemia 91% (n=5547) (some zi patients have 2 and 3 risk factors together). In addition, heart diseases are more common in Sherabod, smoking in Sariosia, Uzun, Altynsoy, diabetes in Boyson, dyslipoproteinemia in Uzun, genetic predisposition in Uzun, Shorchi, Angor, Sariosia, Qizirik, arterial hypertension and anemia in almost the same proportion inall districts.

Risk factors of hemorrhagic stroke (in absolute numbers, 2018-year)

3.13- table

Region / risk factors	Arterial hypertension	Smoking	Heart disease	Arrhythmia	Myocardial infarction	Dyslipoproteinemia	Diabetes	Genetic predisposition	Anemia
Termiz city	168	38	70	36	12	48	66	63	113
Angor	311	74	133	68	30	94	126	140	212
Boysun	309	76	132	68	30	93	125	139	210
Jarqo‘rg‘on	335	83	144	74	32	101	135	150	227
Oltinsoy	343	84	147	76	33	103	139	154	233
Qiziriq	250	59	105	53	21	74	100	111	169
Sariosiyo	423	105	182	96	43	129	173	192	288

Termiz	344	84	147	76	33	104	140	155	234
Uzun	358	88	153	80	55	108	145	161	244
Sherabod	262	62	110	56	23	77	104	116	177
Sho‘rchi	270	64	114	58	24	80	108	120	183
Denov	287	69	122	62	26	86	115	128	195
Qumqo‘rg‘on	335	82	143	74	32	101	136	151	228
Bandixon*									
Muzrabot	255	61	108	55	22	75	102	114	173

**-Bandixon tumani 2019-yil tashkil topgan.*

In 2018, the most identified risk factors in the region were arterial hypertension and anemia, which were observed in Sariosia, Uzun and Termiz districts. In 1/4 of patients, several risk factors: diabetes and arterial hypertension, diabetes and arterial hypertension, heart diseases were present together. Smoking, genetic predisposition, dyslipoproteinemia were identified next. Anemia is almost equally prevalent in all districts and ranks 1st among stroke risk factors.

Risk factors of hemorrhagic stroke (in absolute numbers, 2019-year) 3.14-table

Region / risk factors	Arterial hypertension	Smoking	Heart disease	Arrhythmia	Myocardial infarction	Dyslipoproteinemia	Diabetes	Genetic predisposition	Anemia
Termiz city	172	38	70	34	12	48	66	74	115
Angor	351	86	150	78	34	106	142	158	229
Boysun	326	93	161	84	37	114	153	170	256
Jarqo‘rg‘on	362	89	155	81	35	110	147	163	256
Oltinsoy	369	91	158	83	36	112	150	167	261
Qiziriq	261	62	110	56	23	77	104	116	187
Sariosiyo	431	107	186	98	44	132	176	196	304
Termiz	369	91	158	82	36	112	150	167	261
Uzun	364	90	156	81	65	110	148	154	258
Sherabod	265	63	112	57	23	78	106	118	190
Sho‘rchi	281	67	119	61	25	83	113	125	200
Denov	332	81	142	73	32	100	134	149	236
Qumqo‘rg‘on	346	85	148	77	33	105	140	156	246
Bandixon	203	47	85	42	16	59	80	89	147
Muzrabot	272	65	115	59	24	80	109	121	194

In 2019, the most identified risk factors in the region were arterial hypertension and anemia, which were observed in Sariosia, Uzun and Termiz districts. In 1/3 of patients, several risk factors: diabetes and

arterial hypertension, diabetes and arterial hypertension, heart diseases were present together. Smoking, genetic predisposition, dyslipoproteinemia were identified next. Anemia is almost equally prevalent in all districts and ranks 2nd among stroke risk factors.

Risk factors of hemorrhagic stroke (in absolute numbers, 2020-year)

3.15-table

Region / risk factors	Arterial hypertens	Smoking	Heart disease	Arrhythmia	Myocardial	Dyslipoproteinemi	Diabetes	Genetic predispos	Anemia
Termiz city	173	39	71	44	22	59	77	85	126
Angor	366	97	162	89	44	118	154	171	252
Boysun	404	108	179	98	49	130	170	188	278
Jarqo‘rg‘on	367	98	163	89	45	118	155	171	253
Oltinsoy	381	101	169	93	46	123	161	177	262
Qiziriq	273	73	121	67	33	88	115	128	188
Sariosiyo	442	117	196	108	54	142	186	206	304
Termiz	382	101	169	93	46	123	161	178	263
Uzun	380	101	169	93	46	122	160	177	262
Sherabod	278	74	124	68	34	89	117	130	192
Sho‘rchi	301	80	133	73	37	97	127	140	207
Denov	353	94	157	86	43	113	149	164	243
Qumqo‘rg‘on	362	96	160	88	44	116	153	169	249
Bandixon	215	57	95	52	26	69	91	100	148
Muzrabot	285	76	126	69	35	92	120	133	196

In 2020, the most identified risk factors in the region are arterial hypertension and anemia, which were observed in Sariosia, Boysun and Termiz districts. In 1/3 of patients, several risk factors: diabetes and arterial hypertension, diabetes and arterial hypertension, heart diseases were present together. Smoking, genetic predisposition, dyslipoproteinemia were identified next. Anemia is almost equally prevalent in all districts and ranks 1st among stroke risk factors.

Risk factors of hemorrhagic stroke (in absolute numbers, 2021-year)

3.16-table

Region / risk factors	Arterial hypertension	Smoking	Heart disease	Arrhythmia	Myocardial infarction	Dyslipoproteinemia	Diabetes	Genetic predisposition	Anemia
Termiz city	187	50	83	46	23	60	79	87	129
Angor	363	97	161	89	44	117	153	169	250
Boysun	382	102	169	93	46	123	161	178	263
Jarqo‘rg‘on	370	98	164	90	45	119	156	172	255
Oltinsoy	382	102	169	93	46	123	161	178	263
Qiziriq	271	72	120	66	33	87	114	126	187
Sariosiyo	446	119	198	109	54	144	188	208	308
Termiz	381	101	169	93	46	122	161	177	262
Uzun	383	102	170	94	46	123	162	179	264
Sherabod	282	75	125	69	34	91	119	131	195
Sho‘rchi	298	79	132	73	36	96	126	139	205
Denov	320	85	142	78	39	103	135	149	221
Qumqo‘rg‘on	365	97	162	89	44	117	154	170	252
Bandixon	214	57	95	52	26	69	90	100	148
Muzrabot	283	75	126	69	34	91	120	132	195

In 2021, the most identified risk factors in the region were arterial hypertension and anemia, which were observed in Sariosia, Uzun and Termiz districts. In 1/3 of patients, several risk factors: diabetes and arterial hypertension, diabetes and arterial hypertension, heart diseases were present together. Smoking, genetic predisposition, dyslipoproteinemia were identified next. Anemia is almost equally prevalent in all districts and ranks 2nd among stroke risk factors. In 2022, the most identified risk factors in the region were arterial hypertension and anemia, which were observed in Altinsoy, Uzun and Boysun districts. In 1/4 of patients, several risk factors: diabetes and arterial hypertension, diabetes and arterial hypertension, heart diseases were present together. Smoking, genetic predisposition, dyslipoproteinemia were identified next. Anemia was almost equally distributed in all districts and ranked 2nd among the risk factors of stroke (Table 3.17).

Risk factors of hemorrhagic stroke (in absolute numbers, 2022-year)

3.17-table

Region / risk factors	Arterial hypertens	Smoking	Heart disease	Arrhythmia	Myocardial	Dyslipoproteinemi	Diabetes	Genetic predispos	Anemia
Termiz city	104	27	46	25	12	33	44	48	72
Angor	194	52	86	47	23	62	82	91	134
Boysun	205	54	91	50	25	66	86	95	141
Jarqo‘rg‘on	192	51	85	46	23	61	81	89	132
Oltinsoy	210	56	93	51	25	67	88	97	144
Qiziriq	148	39	66	36	18	47	63	69	102
Sariosiyo	203	54	90	49	24	65	86	95	140
Termiz	205	55	91	50	25	66	86	95	141
Uzun	207	56	92	51	26	67	87	95	142
Sherabod	169	45	75	41	20	54	71	79	116
Sho‘rchi	150	40	67	36	18	48	63	70	104
Denov	171	45	76	41	21	55	72	79	118
Qumqo‘rg‘on	185	49	82	45	22	59	78	86	128
Bandixon	119	32	53	29	14	38	50	55	82
Muzrabot	155	41	69	37	19	50	65	72	107

Dynamic analysis of risk factors 3.18-table

Risk factors / year	**2018**	**2019**	**2020**	**2021**	**2022**	**Total**
Arterial hypertension	3291	3807	3876	3831	1521	**16326**
			χ^2=1,22 p>0,05			
Smoking	1167	1305	1322	1311	696	**5801**
			χ^2=0,4 p>0,05			
Heart disease	1946	2175	2204	2185	1162	**9672**
			χ^2=0,55 p>0,05			
Arrhythmia	1068	1196	1210	1203	634	**5311**
			χ^2=0,31 p>0,05			
Myocardial infarction	533	625	604	596	315	**2673**
			χ^2=18,6 p<0,001			
Dyslipoproteinemia	1410	1576	1599	1585	838	**7008**
			χ^2=3,91 p<0,05			
Diabetes	1851	2068	2096	2079	1102	**9196**
			χ^2=5,2 p<0,05			
Genetic predisposition	2042	2283	2317	2295	1215	**10152**
			χ^2=3,7 p>0,05			
Anemia	3319	3676	3719	3693	2099	**16506**
			χ^2=8,5 p<0,01			

During 2020-2021, risk factors such as myocardial infarction, dyslipoproteinemia, diabetes and anemia had significant differences compared to the same indicators in 2018, 2019 and 2022 (x^2 =18.6 r<0.01; χ12 =3.0.3). x^2 =5.2 p<0.05; x^2 =8.5 p<0.01 respectively), which shows the effect of coronavirus infection in 2020 and 2021.

Conclusion for CHAPTER III

49 % of the hemorrhagic stroke index corresponded to the share of women, 51 % to the share of men. According to the analysis according to the classification of each type of stroke, hemorrhagic stroke occurred in 12 % (n=732) of patients with hemorrhagic stroke in the ventricles of the brain, subarachnoid in 22 % (n=1341) and in 66 % (n=4023) parenchymatous hemorrhage was observed.

According to the pool of blood circulation in cerebral stroke, 71 % (n=4328) had carotid, 27 % (n=1646) had a vertebrobasilar pool, and 2 % (n=122) had an unclear pool. 3896 patients received inpatient treatment, while 931 received medical care at home in the form of patronage and outpatient care (mainly in Uzun, Boysun, Kyzikirqiq, Zharqorgan districts), and especially home treatment during the pandemic (from March 2019 to 2020) period. After the disease, 83% (n=5060) patients survived, 17% (n=1036) died. Most of the deceased are from Angor, Sho‘rchi, Denov, Kumkurgan, Altinsoy, Muzrabot, Uzun districts. The analysis of the above data showed that hemorrhagic stroke is common among the population aged 45 to 74 years, and these rates are increasing among young people. Districts with higher levels of heavy metal pollution had higher rates of hemorrhagic stroke, and death rates were higher in districts with little or no useof neuroimaging methods.

CHAPTER IV. TREATMENT OF IRON DEFICIENCY ANEMIA IN HEMORRHAGIC STROKE THERAPY AND ITS CLINICAL AND NEUROLOGICAL ANALYSIS

§ 4.1 Prevalence of anemia in patients with acute cerebrovascular disorders in Surkhandarya region

In the study of the main risk factor of hemorrhagic stroke in the Surkhandarya region, a significant contribution (91%) was made to anemia. Taking into account the analysis of the above risk factors of patients diagnosed with anemia (n=5547) and we confirmed that anemia is at the same place as arterial hypertension in the population of Surkhandar region and analyzed anemia. 30% (n= 1664) grade 1 (hemoglobin 90 g/l and higher), 65% (n= 3606) grade 2 (Hb 90-70 g/l) and 5% (n= 277) had severe , grade 3 (70 and below) anemia. As can be seen from the diagram in the Q house (Fig. 4.1) , iron deficiency anemia is 1.7 times more common in fertile and middle - aged women than in men .

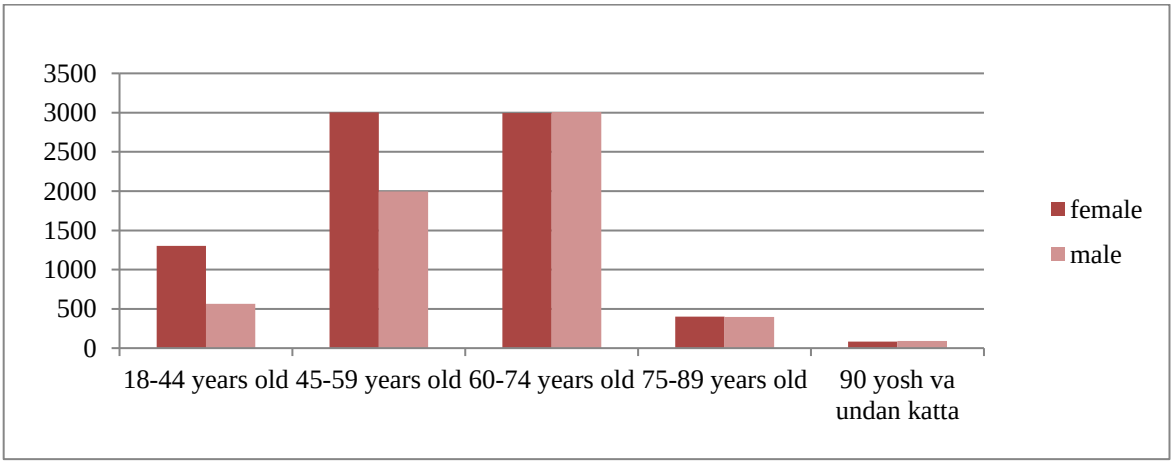


Figure 4.1. The distribution of anemia in patients depends on age

Hemorrhagic stroke was observed in most of the patients with anemia. Anemia is a group of clinical and hematological syndromes, the common sign of which is characterized by a decrease in the amount of hemoglobin and

erythrocytes in the blood. Classification of anemias: 1. According to erythrocyte size: microcytic anemia (iron deficiency anemia), macrocytic anemia (vitamin B_{12} deficiency, folic acid deficiency anemia), normocytic anemia (hemolytic anemia, aplastic anemia, metaplastic anemia).

2. According to the color index. The color indicator shows that the erythrocyte is saturated with hemoglobin. Normally, color indicator is 0.85 - 1.05. Types of anemia depending on it: 1) hypochromic anemia (color index less than 0.85): iron deficiency anemia; thalassemia; 2) normochromic anemia (color index equal to 0.85-1.05): hemolytic anemias (due to excessive breakdown of erythrocytes); posthemorrhagic anemia (due to excessive bleeding); acute and chronic leukemias, lymphomas; aplastic anemia; tumor metastasis to the bonemarrow; anemia developed due to reduced production of erythropoietin; 3) hyperchromic anemia (color index more than 1.1): vitamin B_{12} - deficiency anemia; folic acid deficiency anemia; refractory anemia in myelodysplastic syndrome.

3. According to severity: mild anemia - hemoglobin 90 - 120 g/l; moderate anemia - hemoglobin 90 - 70 g/l.; severe anemia - hemoglobin less than 70 g/l.

4. According to the bone marrow regeneration feature (the main sign of bone marrow regeneration is an increase in reticulocytes in the peripheral blood): 1) norm - reticulocytes 1 - 10‰; 2) aregenerator (aplastic anemia) - reticulocytes are sharply reduced; 3) hyporegenerator (vitamin B_{12} deficiency anemia, iron deficiency anemia) - reticulocytes decrease; 4) normoregenerator or regenerator (posthemorrhagic anemia) - reticulocyte count is normal; 5) hyperregenerative (hemolytic anemias) - the number of reticulocytes increases sharply.

5. Etiopathogenetic classification: 1) anemia of chronic diseases: tuberculosis, bacterial endocarditis, bronchiectatic disease, lung abscess, brucellosis, pyelonephritis, osteomyelitis, collagenoses; 2) iron deficiency anemia; 3) Megaloblastic anemias (vitamin B_{12} deficiency anemia, folic acid

deficiency anemia); 4) hemolytic anemias (congenital and acquired); 5) hypo, aplastic and metaplastic anemias (leukemias, metastases of malignant tumors).

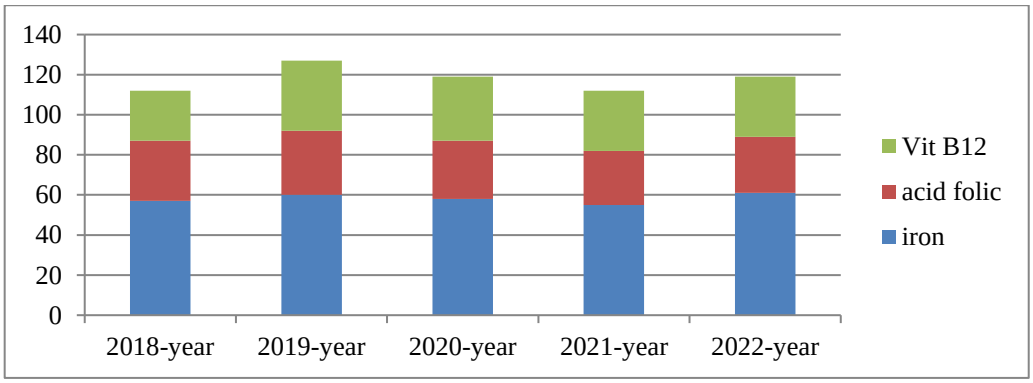
Iron deficiency anemia is the most common, accounting for 80 % of all anemias. Cytological signs of iron deficiency anemia: 1. In peripheral blood: erythrocyte and hemoglobin decrease, erythrocyte microcytosis - (6 μm and smaller), erythrocyte hypochromia, erythrocyte poikilocytosis. 2. Normoblastic blood formation, erythroid row hyperplasia is observed in the myelogram. Megaloblastic anemia includes anemias of vitamin B_{12} and folic acid deficiency, and their cytological signs are as follows: 1. In peripheral blood: erythrocyte and hemoglobin decrease, erythrocyte macrocytosis (9-12 μm), megalocytosis (enlargement from 12 μm), erythrocyte hyperchromia, erythrocyte poikilocytosis - changes, zolly bodies (nuclear remnants), kebolt rings (nuclear membrane), hypersegmentation of neutrophils with a segmented nucleus - 5 or more segments, reduction of reticulocytes. In severe anemias: appearance of megaloblasts, reduction of thrombocytes, increase of macroplatelets, appearance of erythrocytes stained with polychromaphilia - polychromatophyll, appearance of myelocytes and metamyelocytes; reticulocytes increase as a result of addition of hemolysis in splenic sinuses when megalocytes increase. 2. Megaloblastic blood formation, erythroid row hyperplasia is observed in the myelogram. Acute posthemorrhagic anemia is characterized by heavy bleeding in a short period of time. In the diagnosis of acute posthemorrhagic anemia, the results of objective examination and instrumental examination are of great importance.

Hemolytic anemias are congenital and acquired. Cytological signs typicalfor hemolytic anemias : 1. In peripheral blood: reduction of erythrocytes and hemoglobin; erythrocyte normochromia (erythrocyte hypochromia only in thalassemia observed); normocytosis of erythrocytes (only in microspherocytosis, the diameter of erythrocytes decreases); reticulocytes increase; in congenital hemolytic anemias, the shape of erythrocytes changes: in microspherocytosis, small 5 - 6 μm, hyperchromic erythrocytes appear; Oval

- shaped erythrocytes appear in ovalocytosis; star-shaped erythrocytes appear in acanthocytosis; mouth- shaped erythrocytes with a hypochromic zone appear in stomatocytosis; in sickle cell anemia, the shape of erythrocytes does not change under normal conditions, only in the case of severe hypoxia, a hemolytic crisis occurs, and sickle erythrocytes - dacryocytes appear; in thalassemia, target-like, hypochromic erythrocytes - kodocytes appear. In a hemolytic crisis: a large number of immature nuclear normocytes appear, the amount of reticulocytes exceeds 30%.

2. Normoblastic blood formation, erythroid row hyperplasia is observed in the myelogram. Hypo-, aplastic anemia is associated with a decrease in the number of stem cells in the bone marrow, resulting in a decrease in all cells. Cytological signs of aplastic anemia: 1. In peripheral blood: pancytopenia (reduction of several blood-forming elements), erythrocyte normochromia, erythrocyte normocytosis, relative lymphocytosis (the absolute amount of lymphocytes decreases, the relativeamount in the leukoformula increases). 2. In the myelogram, all the cells of the bone marrow are sharply reduced, and the amount of lymphocytes is relatively increased.

Accordingly, taking into account that there are several types of anemia, it was analyzed which type of anemia is more common in the region (Figure 4.2).



4.2 Figure. **Dynamic analysis of anemia in Surkhandarya region**

According to it, 52.3 % (n=27) of patients whose blood was taken for scientific research had anemia, TTA, 20% (n=10) cyanocobalamin deficiency anemia and 27.7% (n=14) folic acid deficiency anemia.

§ 4.2. Clinical course of hemorrhagic stroke against the background of iron deficiency anemia and comparative analysis

Patients were divided into 2 equal groups according to the amount of iron in the blood: in group 1 patients with acute cerebral blood circulation disorders with normal iron levels in their blood, in group 2 patients with less than normal levels ofiron (table 4.1) .

Dynamic analysis of the course of hemorrhagic stroke in groups according to neurologicalscal 4.1 table

Evaluation criteria	Patients with iron deficiency in their blood, n=51		Patients without blood iron deficiency (comparison group), n=51	
	before therapy	after therapy	before therapy	after therapy
Scandinavian scale	49.6	61.5	50.3	75.9
W Wilcoxon	W =15.2 r<0.05		W = 17.7 r<0.05	
Mann - Whitt (before and	U =8.5 r<0.05			
after treatment for study and comparison group)				
NIHSS scale	13.7	9.1	12.7	7.8
W Wilcoxon	W =9.3 r<0.05		W = 16.8 r<0.05	

He used the Mann-Whitt (before and after treatment for the study and comparison group) .	U =5.9 r<0.05

According to Table 4.1, group 1, i.e., patients with blood iron levels below the norm, had a severe illness and somewhat slower recovery. In treatment, the results of the Scandinavian scale were significantly better in patients without anemia than in patients with iron deficiency ($W_{Wilcoxon}$ =15.2 p<0.05). There are also significant differences in scores after treatment on the Scandinavian scale between the main and control groups ($U_{Mann-Whitney}$ = 8.5 p<0.05).

Even when evaluated by the NIHSS scale, there is a significant improvement in outcomes in non-anemic patients ($W_{Wilcoxon}$ =9.3p<0.05). Significant differences in post-treatment outcomes were also found on the NIHSS scale between the main and control groups ($U_{Mann-Whitney}$ = 5.9 p<0.05).

It can be seen that group 1, i.e., patients with blood iron levels below the norm, had a more severe disease and a somewhat slower recovery.

§ 4.3. Dynamic analysis of clinical and neurological parameters in the treatment of hemorrhagic stroke against the background of iron deficiency anemia

Divided into two subgroups based on the approach to treatment.

Treatment of patients in subgroup 1, despite the presence of anemia, was treated only on a standard basis.

In order to evaluate the effectiveness of the iron preparation in the 2nd subgroup, the complex preparation of iron (III) hydroxide with sucrose was included in the standard treatment plan of the group according to the results of the patient's

blood analysis and the determined amount of iron. Also, patients were recommended a diet rich in iron (meat, liver, fish, soybeans, peas, raisins, etc.).

From the iron drug group, 5 ml of iron (III) hydroxide sucrose complex (100 mg iron (III) hydroxide) was slowly dripped intravenously; initially diluted with 200 ml of 0.9% sodium chloride, daily for 10 days, then administered orally: 1 capsule (50 mg) once or twice a day for 2 months. In the dynamics of treatment in the studied patients, we evaluated subjective feelings, somatic and neurological status, general condition indicators based on neurological scales.

According to the subjective complaints of the subjects during the treatment and their comparison with the condition at the initial examination in each subgroup showed specific results. Subjective assessment of the subgroup I.1 studied only against the background of BT showed a decrease in cephalgia by 25 % (6 patients), tinnitus by 4 % (1 patient), improvement of emotional mood by 20 % (5 patients), walking 4 % improvement (1 patient), 29 % reduction in insomnia (7 patients), 4 % improvement in urinary control (1 patient) and 17 % improvement in memory (4 patients). In subgroup I.2, the positive dynamics of therapy against the background of BT and iron preparations was determined in the form of reduction of cephalgia by 42 % (11 patients), dizziness by 19 % (5 patients) and tinnitus by 19 % (5 patients); improvement of emotional mood by 42 % (11 patients) and walking by 31 % (8 patients); reduction of dyssomnia by 35 % (9 patients); improvement of urinary control by 15 % (4 patients) and memory by 31 % (8 patients) (Table 4.2).

Table 4.2

Dynamics of subjective symptoms against the background of basic therapyand iron (III) hydroxydisacrose complex

Group G	I.1. subgroup , n=25 (BD)				I.2. subgroup , n=26 (BD + TGSK)				χ^2
Symptoms	Before treatment		After treatment		Before treatment		After treatment		
	Abs	%	Abs	%	Abs	%	Abs	%	

Cephalgia	22	88	16	64	20	76.9	9	34.6	$\chi^2 = 3.24$ r >0.05
Vertigo	10	40	10	4 0	8	30.8	3	11.5	$\chi^2 = 6.4$ r < 0.05
Violation of the movement system	12	48	11	4 4	8	30.8	3	11.5	$\chi^2 = 5.5$ r < 0.05
Disturbance of pleasure	20	8 0	15	60	20	76.9	9	34.6	$\chi^2 = 3,6$ r >0.05
Violation of movement coordination	9	3 6	8	3 2	15	57.7	7	26.9	$\chi^2 = 3,8$ r < 0.05
Dyssomnia	16	6 4	9	3 6	23	88.5	14	53.8	$\chi^2 = 0.07$ r >0.05
Memory loss	24	96	20	8 0	26	100	18	69.2	$\chi^2 = 0.6$ r >0.05
Disorders of the sensory system	6	2 4	5	2 0	10	38.5	6	23.1	$\chi^2 = 0.6$ r >0.05

Against the background of iron therapy, dizziness ($\chi^2 = 6.4$ p<0.05), movement disorder ($\chi^2 =5.5$ r<0.05), movement coordination disorder ($\chi^2 =3.8$ r (<0.05) a significant improvement of the patient's condition was observed.

A comparative analysis of changes in subjective symptoms of each group was performed separately. In group I of patients with hemorrhagic stroke against the background of BT and TGSK, positive therapeutic dynamics was better observed in subgroup I.2 (Table 4.3).

Table 4.3. Comparative assessment of subjective complaints of subjects duringtreatment

Group G	I.1. subgroup , n=25 (BT)				I.2. subgroup , n=26 (BT + IGSC)				χ^2
Symptoms	Before treatment		After treatment		Before treatment		After treatment		
	Abs	%	Abs	%	Abs	%	Abs	%	
Cephalgia	22	88	16	64	20	76.9	9	34.6	$\chi^2 = 3.24$ r >0.05
Vertigo	10	40	10	4 0	8	30.8	3	11.5	$\chi^2 = 6.4$ r < 0.05
Violation of the movement system	12	48	11	4 4	8	30.8	3	11.5	$\chi^2 = 5.5$ r < 0.05

Disturbance of pleasure	20	8 0	15	60	20	76.9	9	34.6	$\chi^2 = 3,6$ r >0.05
Violation of movement coordination	9	3 6	8	3 2	15	57.7	7	26.9	$\chi^2 = 3,8$ r < 0.05
Dyssomnia	16	6 4	9	3 6	23	88.5	14	53.8	$\chi^2 = 0.07$ r >0.05
Memory loss	24	96	20	8 0	26	100	18	69.2	$\chi^2 = 0.6$ r >0.05
Disorders of the sensory system	6	2 4	5	2 0	10	38.5	6	23.1	$\chi^2 = 0.6$ r >0.05

Against the background of iron drug therapy, dizziness (χ^2 = 6.4 p<0.05), movement disorder (χ^2 =5.5 r<0.05), movement coordination disorder (χ^2 =3.8 A significant improvement of the condition was observed according to indicators such as r<0.05) .

The neurological picture of the studied group I showed the following indicators: a decrease in the symptoms of light pyramidal insufficiency - in 1 (4 %) (subgroup I.1) patients; absence of pathological Babinski reflex - 1 (4 %) (subgroupI.1.) and central paresis of VII and XII pairs of cranial insufficiency - in 1 (4 %) (subgroup I.1) patient; reduction of convergence weakness - in 1 (4 %) (subgroup I.1) patients; reduction of symptoms of ataxia - 2 (8 %) (subgroup I.1) patients and central urinary incontinence - 2 (8 %) (subgroup I.1) patients were observed. At the same time, 3 patients (12 %) had a pathological Rossolimo reflex in subgroups I.2, loss of oral automatism reflexes, and in subgroups I.1 these indicators did not change in dynamics. We also performed a comparative analysis of the dynamics of neurological symptoms among subgroups of patients with stroke on the background of IDA, where we can note a statistically significant positive trend in the subgroup I.2 who received IGSC on the background.

Table 4.4. Comparative dynamics of the neurological condition of patients against thebackground of basic and IGSC therapy.

Group	Group I – patients with stroke on the background of IDA , n=51	χ^2

	I.1. subgroup , n=25 (BT), abs (%)		I.2. subgroup ,, n=26 (BT + IGSC), abs (%)		
Symptomatics	Before treatment	After treatment	Before treatment	After treatment	
Mild pyramidal deficiency	18 (7 2 %)	17 (68 %)	21 (81%)	12 (46%)*+	$\chi^2 = 4.15$ r < 0.05
Oral automatism reflexes	10 (4 0 %)	10 (4 0 %)	8 (31%)	5 (19%)*+	$\chi^2 = 1.8$ r >0.05
Rossolimo pathological reflex	20 (8 0 %)	20 (8 0 %)	21 (81%)	15 (58%)*+	$\chi^2 = 2.05$ r >0.05
Babinski's pathological reflex	15 (6 0 %)	14 (5 6 %)	15 (58%)	11 (42%)*+	$\chi^2 = 0.8$ r >0.05
VII and XII paired cranial nerves	15 (6 0 %)	14 (5 6 %)	22 (85%)	16 (62%)*+	$\chi^2 = 0.97$ r >0.05
Slowness of convergence	7 (2 8 %)	6 (2 4 %)	10 (38%)	7 (27%)*+	$\chi^2 = 0.25$ r >0.05
Gait disorder	13 (5 2 %)	11 (4 4 %)	22 (85%)	11 (41%)*+	$\chi^2 = 4.07$ r < 0.05
Urinary incontinence of the central type	8 (3 2 %)	6 (2 4 %)	11 (42%)	6 (23%)*+	$\chi^2 = 0.71$ r >0.05

Against the background of complex therapy with iron drug, a significant improvement of the neurological condition was observed according to criteria such as regression of pyramidal insufficiency ($\chi^2 = 4.15$ $p<0.05$) and improvement of walking ($\chi^2 = 4.07$ $p<0.05$).

Also, on the background of treatment with iron - containing preparations, the results on the Scandinavian scale were significantly improved ($W_{Wilkoxon} = 15.2$ $p<0.05$). There are also significant differences in scores after treatment on the Scandinavian scale between the main and control groups ($U_{Mann-Whitney} = 8.5$ $p<0.05$).

When evaluated according to the NIHSS scale, there is a significant improvement of results against the background of treatment with iron-containing preparations ($W_{Wilcoxon} = 9.3$ $p<0.05$). Significant differences

were found in the results after treatment on the NIHSS scale between the main and control groups (UMann-Whitney = 5.9 $p<0.05$).

Thus, the analysis of subjective symptoms and the dynamics of clinical and neurological status in both groups against the background of basic and IGSC therapy showed that daily activity and deficits in clinical and neurological manifestations in the subgroups of patients receiving IGSC were more significant than in patients who received only basic therapy were more regressed compared totheir subgroups.

According to the results of the above tests, it can be concluded that the lower than normal level of iron in the blood directly affects the rheological properties of the blood, aggravates the course of cerebral stroke, and leads to stagnation of complications. In the treatment of acute cerebral stroke, it is important to pay special attention to the results of blood analysis of patients and individual approachto treatment, choosing the right diet for them.

§ 4.4. Organization of the method of treatment of hemorrhagic stroke patients in Surkhandarya

Today, 15 – 20 % of deaths worldwide are due to the consequences of stroke. Day by day deterioration of ecology, restriction of movement, improper nutrition, deterioration of food quality, reduction of physical work, increase in the number of various infectious diseases, increase of the world of external influences as a social factor, increase in the flow of information that brings stress, among many diseases today, people suffer from cardiovascular diseases. Also leads to an increase in the number of patients. Including in the territory of Uzbekistan, the number of patients suffering from this disease is large, and according to the statistics of 2018, it is recorded that it ranks 20th in the world ranking by the number of patients.

In general, among the countries of Central Asia, according to this indicator, Uzbekistan ranks fourth, 9.15-9.86 % of the population is diagnosed with a stroke every year. Another key indicator is the low number of patients

returning to work after a stroke in our country. If the number of stroke patients is 100 %, then 10 %- 15 % of them die, 40 % need constant care, 20 % cannot move independently, only 20 – 25 % of patients have returned to work. It is important to develop measures to restore the life activity of 60 % of patients with this problem, to organize optimal rehabilitation. The task of rehabilitation is to use them and torestore the function of damaged but still living neurons, and to train them to take over the functions of dead nerve cells. Neurorehabilitation after a hemorrhagic stroke is all therapeutic procedures aimed at restoring the activity of damaged but not dead neurons after a stroke. Neurorehabilitation after a stroke is a comprehensive program aimed at restoring neurological motor deficits after an acute disruption of the blood supply to the brain. The goals of rehabilitation after stroke are as follows: to make the patient recover as much movement as possible; improve the patient's gait; improving the patient's speech recovery; teaching self - care skills; formationof social and psychological adaptation of the patient to his condition; prevention of recurrent stroke and its complications; increase life expectancy. Training and psychological support for the patient's family members is a new type of rehabilitation in the process of neurorehabilitation after a stroke and is of great importance. Neurorehabilitation is a complex of special treatment measures applied to patients suffering from diseases affecting the nervous system. The process of neurorehabilitation after stroke is a team effort. Specialists participating in neurorehabilitation include physiotherapists, rehabilitation specialists, neurologists, neurosurgeons, other medical specialists (therapists, respiratory therapists, prosthetists and orthopedists, rehabilitation nurses, psychologists, professional consultants). Physiotherapy helps patients regain their physical mobility, including: balance restoration, gait training and learning activities, neuromuscular rehabilitation, orthopedic consultations and acutherapy. Occupational therapy helps patients with activities of daily living, cognitive rehabilitation - retraining memory, attention, processing and executive functions. It also includes neuromuscular strengthening and training,

and development of visual perception. Rehabilitation psychologists and speech-language pathologists are beginning to teach cognitive rehabilitation as well as instruction in life changes that promote self - independence. Speech and language therapy involves helping patients with swallowing and speaking problems. Rehabilitative psychology helps patients cope with personality changes, especially those caused by brain injuries, and in their changed personality. The main method of rehabilitation after a stroke is kinesitherapy or "movement therapy". In this method, there are many exercise options and alternative medicine methods are used to restore acute cerebrovascular disorders. The kinesiotherapy method is based on physical activity using specially designed simulators. A set of exercises helps to restore blood circulation in the brain and start recovery processes in brain tissue. Kinesiotherapy treatment is carried out without the use of drugs, with the active participation of the patient in the rehabilitation process. Kinesiotherapy is carried out with mandatory training on multifunctional simulators and basic rehabilitation simulators. Special sofas, belts, cuffs, shoulder belts are used during training. All exercises are simple and safe, but have strong rehabilitation potential. Post-stroke neurorehabilitation should begin as early as possible, immediately after the acute event. This is because for some time after a stroke, the rate of recovery of functions slows down and the likelihood of returning to normal life decreases. The sooner the rehabilitation starts, the faster the neurological deficits disappear and the more functions are restored. Recurrent hemorrhagic strokes are always more severe and carry a greater risk of disability. Stroke survivors should pay special attention to blood pressure, blood sugar, and cholesterol levels, control bad habits, and monitor sleep and active recreation. Neglecting a healthy lifestyle leads to recurrent hemorrhagic strokes with a high probability of death. Thus, early rehabilitation is a necessary link in the system of inpatient care for hemorrhagic stroke patients. Its main areas are: activating care, positional treatment, ontogenetic kinesiotherapy, drugs for homeostasis processes (including hemodynamics and

microcirculation) and active mobilization. Research and studies have shown that kinesiotherapy has a positive effect on restoring motor functions and increasing the efficiency of the body's functional systems. Correctly selected and timely physical rehabilitation helps to reduce the duration of treatment of long - term stroke consequences. Like any other treatment, there are advantages and disadvantages to the kinesiotherapy program. The advantages are the versatility of the method, and kinesiotherapy is suitable for the treatment of many diseases and injuries; it is important to ensure safety in kinesiotherapy, which, like other treatment measures, does not include the use of drugs containing narcotics; there are no restrictions on gender and age, it can be used by patients of all ages; improves the patient's immunity and muscle tone after the rehabilitation course. Disadvantages of the method are the regimen, that is, the need to follow a prescribed lifestyle, as well as the fact that it takes a long time to feel the effect of kinesiotherapy, and the method lasts for a long time. It is better to gradually restore lost functions after a stroke than to achieve positive dynamics by using chemical substances.

Half of the patients living three years after a stroke are dissatisfied with their life to some extent. For this reason, kinesiotherapy first of all gives the patient courage in his actions, reawakens his hope for life, and kinesiotherapy group training connects him with social life again. A person who has had a stroke suddenly loses the ability to control an arm or a leg, his/her speech becomes impaired, he/she cannot eat independently, he/she cannot move. The patient cannot return to the profession he/she loves, he/she loses his/her job. Due to these reasons, the patient becomes depressed and develops a deeper sense of hopelessness. Recovery and rehabilitation of such a patient is an important medical and social task.

Also, the air where are frequent and complications are severe is more polluted with heavy metals (air pollution with toxic substances in the regions bordering Tajikistan, "Afghan" wind in the city of Termiz and its surrounding districts, etc.) In the districts (Sariosiyo, Uzun, Altinsoy, Termiz,

Jargorgon, Denov) it is necessary to develop a state program for air purification and reduction of polluting factors, to explain to the population the importance of protecting the environment. Taking into account that strokes are more common in spring and winter, it is necessary to undergo preventive medical examination twice a year for representatives of the risk group.

In addition, heart diseases are more common in Sherabod, smoking in Sariosia, Uzun, Altynsoy, diabetes in Boyson, dyslipoproteinemia in Uzun, genetic predisposition in Uzun, Sho‘rchi, Angor, Sariosia, Qizirik, arterial hypertension andanemia in almost the same proportion in all districts due to the fact that most of these depend on the lifestyle of the population, it is necessary to promote proper nutrition and healthy lifestyle while taking into account the risk factor in the hemorrhagic stroke.

In addition, taking into account the main risk factors of hemorrhagic stroke in the region, the organization of medical services, especially through the prevention and early treatment of anemia, allows to reduce the risk of stroke by several times, and to ease the course of the disease and reduce complications in patients with a stroke against the background of anemia.

In the above studies, by providing the most necessary modern neuroimaging tests (MSCT) and attaching suitable ambulances to remote areas, the death rate in those areas can be greatly reduced.

Conclusion for CHAPTER IV

The main therapy of the study groups, depending on the type of stroke, was carried out according to the standard protocol, together with antihypertensive, antitumor, vasoactive, anticoagulant/hemostatic, neuroprotective agents and iron preparations. Therapy 5 ml of sucrose complex of iron (III) hydroxide (100 mg of iron (III) hydroxide) was administered slowly intravenously, initially diluted with 200 ml of 0.9% sodium chloride, daily for 10 days, then orally: 1 capsule (50 mg)

1-2 times for 2 months. In the dynamics of treatment in the studied patients, we evaluated subjective feelings, somatic and neurological status, general condition indicators using neurological scales.

Analysis of the dynamics of subjective symptoms and clinical and neurological status against the background of the main and iron drug therapy in thestudied group showed that the deficit in daily activity and clinical and neurological status was more regressed compared to subgroups of patients who underwent only BT. There is a direct correlation between the severity of anemia and the risk of stroke, and iron supplements have been found to be effective in addition to the standard treatment approach. When studying the dynamics of the patients' neurostatus, a positive correlation was found between the NIHHS, Orgogozo, and self-service scales.

CONCLUSIONS

1. The average annual hemorrhagic stroke rate in Surkhandarya region was 1.8 per 1000 inhabitants per year. Strokes are more common in districts where the air is polluted with heavy metals and harmful substances. During the "Afghan" wind, applicationsincreased in the city of Termiz and its surrounding districts. Strokes are more common in spring and winter, depending on the diet and lifestyle of the population, and environmental factors.

2. The disease occurs almost equally in men and women (51 % and 49 %, respectively). In the region, stroke was the most common among the population aged 60 - 74, which was 41 %.

3. Stroke was recorded in the anamnesis of 47 % (n=2865) patients once, 1.7 % (n= 103) 2 times, 0.4 % (n=24) 3 or more times.

4. The death rate from stroke in the region is 0.31 on average for these years; lethality was 17%. Most of those who died were in Angor,

Sho‘rchi, Denov, Kumkurgan, Altinsoy, Muzrabot, Uzun districts.

5. Among the main risk factors of hemorrhagic stroke were anemia 91 % (n=5547), arterial hypertension 90 % (n=5486), heart disease 40 % (n=2438), diabetes 38 % (n=2316) and genetic predisposition 42 % (n =2560) was determined. Heart diseases are more common in Sherabod, smoking in Sariosia, Uzun, Altynsoy, diabetes in Boyson, dyslipoproteinemia in Uzun, genetic predisposition is more common in Uzun, Shorchi, Angor, Sariosia, Qizirik, while anemia and arterial hypertension are recorded in almost the same proportion in all districts. .

6. The severity of clinical and neurological symptoms in patients with hemorrhagic strokehas a high correct correlation with the presence of iron deficiency anemia and the degree of deficiency, a correct proportional relationship between the severity of anemia and the occurrence of hemorrhagic stroke it has been determined that there is a deficiency.

PRACTICAL RECOMMENDATIONS

Taking into account the increase in the annual frequency of new cases of hemorrhagic stroke in winter and spring, during the preventive measures of brain hemorrhagic stroke among the residents of Surkhandarya region, it should be carried out twice a year (in January - February, March -April), the first signs of stroke and their occurrence the need to refer to specialized medical care should be explained. It is recommended toimprove the material and technical base of remote districts of the region and to improve the quality of emergency medical care and to form small emergency medical teams adapted to specific hemorrhagic stroke, taking into account that hospitalization within the first 6 hours after the onset of a hemorrhagic stroke has a high effect.

Information on the structure and risk factors of brain hemorrhagic stroke among the residents of Surkhandarya region should be taken into account in the

treatment and prevention work of neurologists and therapists in other regions with similar geoclimatic and demographic conditions. Taking into account the increase in the annual frequency of new cases of hemorrhagic stroke in winter and spring in the Surkhandarya region, preventive measures should be carried out twice a year (in January - April, August and December), the population should be informed and need to be explained of the first signs of hemorrhagic stroke, while seek specialized medical care when they appear. Since anemia is recorded in almost the same proportion in all districts and among representatives of all sexes and ages, timely identification and treatment of anemia and its type among the population of the region, determination of the type of anemia in the blood serum of patients and, accordingly, additional use of standard treatment is recommended.

Hemorrhagic stroke therapy should include measures to eliminate vascular risk factors, as well as differential use of iron preparations in combination with standard treatment criteria for advanced stroke against the background of iron deficiency anemia: 10 days - 5 ml (100 mg of iron (III) hydroxide with sucrose complex) + 0.9% 200 ml of sodium chloride intravenous drip, then transition to oral administration of 1 capsule (50 mg) 1-2 times a day for 2 months.

It was found that there is a need for modern neurovisualization diagnostic methods (MSKT/MRT) in provinces. It is required to create a single form of reporting on morbidity, mortality and mortality rates from cerebrovascular diseases, including the inclusion of these indicators on the form as a separate item for stroke.

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APPLICATIONS

Appendix 1

National Stroke Registry Questionnaire

1. Province , district :
2. I of the patient . F. _ Sh .
3. Time of registration (day , month , year):
4. Gender : - male – female
5. Age :
6. Date of onset of stroke (day , month , year):
7. Type of stroke (code according to ICRC-10 or 9):

– ischemic
– hemorrhagic
– uncertain

8. In case of an ischemic stroke, damage is noted in which basin :

– carotid
– vertebrobasilar basin
– uncertain

9. Damage to the cerebral hemisphere :

– right hemisphere
- left hemisphere
– brain stem

10. Neuroimaging techniques

-KT
-M R I
- UZDG
- not transferred

11.Type of hemorrhagic stroke :

- Parenchymatous hemorrhage
- Bleeding into the ventricles
- Subarachnoid hemorrhage

12. The number of strokes recorded in the anamnesis:

- once
- twice
– three and more
– not recorded

13. Main risk factors :

- Arterial hypertension
- Smoking
- Heart diseases
- Fluctuating arrhythmia
- Myocardial infarction
- Dyslipoptotheidemia

- Diabetes
- Genetic predisposition
- Anemia

14. Place of treatment;

- in the hospital
- in a nursing home
- at home
- medical assistance was not provided
- another place

15. Result of treatment:

-life

– died

16. Days of life :

17. Whether an autopsy was performed :
    1 - Yes, in the hospital
    2 - yes, in the forensic
    3. examination
    4 - no , it was not done

18. According to the results of the analysis, the type of stroke :

filled out the questionnaire .

Appendix 2

Hunt and Hess scale

Degree	**Characteristic**
0	An unruptured aneurysm
I	Asymptomatic or minimal headache and mild neck muscle stiffness
IA	Presence of persistent neurological symptoms in the absence
	of meningeal or generalized symptoms
II	Moderate or severe headache, neck muscle stiffness; absence of neurological deficit except paresis of cranial nerves;
III	Somnolence (drowsiness), disorientation (disorientation in relation to time and environment) or mild local deficit
IV	Stupor , medium or deep hemiparesis, de Cerebral rigidity and the possibility of vegetative disorders
V	Signs of deep coma, decerebrate rigidity and agony

Appendix 3

Self-Service Rating Scale

Level of self-service	**Points**
It does not serve itself at all.	1
He serves himself partially with the help of a healthy hand, he needs external help.	2
himself partially not only with the help of the healthy hand, but also with the sick hand , which performs an auxiliary function . Needs constant care.	3
Fully serves himself with two hands. The diseased hand performs the function, but to a limited extent, the speed of execution is slow. No need for regular maintenance.	4
Self-service is complete, but a little slow. The speed of movement is normal .	5 6

Appendix 4

Glasgow scale

Functional learning	Rating, score
Eye opening:	
• optional	4
• Opening his eyes to sound	3
• Opening his eyes to pain	2
• no answer	1
Action reaction *:*	
• Performs ordered actions	6
Purposeful movement (retraction) in response to painful exposure	5
• Limb withdrawal in response to painful exposure	4
• Pathological bending in response to painful impact	3
• Pathological joint contractions in response to painful effects	2

Motion is not detected	1
Speech reactions:	
• The patient answers questions quickly , purposefully and correctly	5
• Untargeted , mixed words _	4
• Unintelligible words that do not correspond to the question	3
• Untargeted , vague sounds	2

• no speech league	1

Appendix 5

NIHSS scale

1. a	Consciousness	Saved somnolence sopor coma	0 1 2 3
1. b	Answers to questions	Clearly somewhat confused (including due to aphasia) completely confused (including due to aphasia)	0 1 2
1. c	Execution of instructions	Does it right does it by mistake performs incorrectly	0 1 2
2.	Agnosia	no lightly expressed strongly expressed	0 1 2
3.	Gaze paralysis	no mild gaze palsy complete gaze paralysis	0 1 2
4.	Blind spot _	Unbroken quadrant hemianopia complete hemianopsia	0 1 2
5.	Paralysis of facial muscles	No light partially full	0 1 2 3
6.	Hand movements _	No paresis, no plegia light weight loss moderate paresis deep paresis	0 1 2 3
		plegia	4
7.	Leg movement	No paresis, no plegia light weight loss moderate paresis deep paresis plegia	0 1 2 3 4
8 .	Ataxia	No On one side On both sides	0 1 1
9 .	Sensitivity	Unbroken	0

		hypesthesia anesthesia	1 2
1 0 .	Dysarthria	No average anarthria	0 1 2
1 1 .	Aphasia	No average heavy total	0 1 2 3

Appendix 6

Barthel DW scale

Type of activity	**Conditions**	**Points**
All categories of activity	No action can be taken	0
Eating	Independent With the help of others	10 5
Washing	Without the help of others	5
Daily hygiene - washing face, shaving, brushing teeth, combing hair	Independent With the help of others	10 5
Dress up	Independent With help	10 5
Management of defecation	independent sometimes impotence	10 5
Control of urinary excretion	Independent infrequent seizures	10 5
Use the toilet	Independent With help	10 5
Transfer from chair to bed	Independent With minimal help	15 10
	Can sit but needs help to move	5
Movement	independently 45 meters 45 meters 45 meters in a wheelchair	15 10 5
Climbing the stairs	Independent With help	10 5
Total :		