Optimization of the diagnosis and treatment of early neurological complications in cardio embolicstroke

Dilbar T. Khodjieva[1], Zarnigor .Nurova[2], Nodir K. Khaydarov[3], Dildor K. Khaydarova[4]

[1,2,3,4]Bukhara State Medical InstituteRepublic of Uzbekistan

Abstract:*Acute ischemic damage to neurons during the development of a focus of cerebral infarction (CI) is based on a complex cascade of interaction between the endothelium of the vascular wall, hemostatic factors, neurons and microglia. Oxygen starvation of tissues stimulates the production of endothelial cells of endothelial dysfunction markers produced by blood vessel endotheliocytes, macrophages, neurons and neuroglia in response to hypoxic brain damage. The so-called "cell death genes" are activated, which are responsible for the development of apoptosis, or programmed death of ischemic penumbra cells, as a result of the expansion of which the infarction volume increases*

Keywords:*embolic, stroke, neurological, treatment*

1. INTRODUCTION

Relevance of the topic: In Uzbekistan, the number of patients with cerebral stroke is quite large - about 40-45 thousand cases of cerebral stroke are registered annually. More than 80% of stroke patients permanently lose their ability to work and only 10.2% of surviving patients return to work (Gafurov B.G., 2009; MadjidovaYa.N., Khadjieva D.T., 2019). By 2030, an increase in mortality from stroke worldwide is projected to 7.8 million people per year, if active global measures are not taken to combat this epidemic (Khachinski V., 2007; Bokeria L.A., Gudkova R.G., 2012; Madzhidova Y.N., 2016).

Cardioembolic stroke (CS) is one of the most frequent and severe forms of ischemic stroke (IS). In the light of the concept of multifactoriality of the pathogenesis of IS, studies of the clinical features of IS, including CS, are very relevant. The most acute and acute periods are the most important links in the development and course of acute disorders of cerebral circulation (ADCC).

To objectify the severity of neurological changes and disorders in the functional daily life of patients with stroke in recent years, clinical rating scales have been increasingly used, in particular, NIHSS, Orgogozo, Scandinavian, Guseva-Skvortsova, Bartela [and others]. However, the ambiguity of the data in the literature of such studies in patients with acute and acute periods of IS, including in CS, is a limiting factor in the development of qualitatively new rehabilitation schemes.

One of the urgent problems in neurology is the adequate prescription of combined neuroprotective therapy for ischemic stroke (IS) in the acute period, since the result of

treatment at this stage largely determines the patient's quality of life after a stroke (Shchepin O.P., 2009; Medik V.A. , 2009; Sabgaida T.P. et al., 2011; Lindenbraten A.L. et al., 2012).

Acute ischemic damage to neurons during the development of a focus of cerebral infarction (CI) is based on a complex cascade of interaction between the endothelium of the vascular wall, hemostatic factors, neurons and microglia. Oxygen starvation of tissues stimulates the production of endothelial cells of endothelial dysfunction markers produced by blood vessel endotheliocytes, macrophages, neurons and neuroglia in response to hypoxic brain damage. The so-called "cell death genes" are activated, which are responsible for the development of apoptosis, or programmed death of ischemic penumbra cells, as a result of the expansion of which the infarction volume increases.

With IS, universal patterns of brain tissue response to a decrease in perfusion were established, which made it possible to formulate a statement about the dynamic nature and potential reversibility of cerebral ischemia and the need to apply urgent measures to combine the restoration of blood flow and protect the brain from ischemic damage in the most acute and acute period with CS (Gusev E.I., 2013).

Since each of the neuroprotective drugs has a limited range of effects on pathological processes in IS, it is relevant and justified to study the effectiveness of treating patients with a combination of several neurotropic agents.

2. COMPLIANCE OF THE TOPIC OF THE DISSERTATION WITH THE PRIORITY AREAS OF RESEARCH IN THE REPUBLIC.

Providing the population with high-quality and affordable medical care is an important and priority area of healthcare in Uzbekistan. The planned dissertation work is devoted to the development and improvement of approaches to improving the efficiency of patient management in the acute period of ischemic CS based on more accurate diagnostics, predicting its course and outcomes, as well as optimizing neuroprotective therapy. The data obtained during the study lead to an improvement in the quality of life of patients with this pathology. This determines the priority areas of research and development in the Republic.

3. THE RELATIONSHIP OF WORK WITH GOVERNMENT PROGRAMS OR RESEARCH AND DEVELOPMENT.

The dissertation work was carried out in accordance with the plan of scientific research work of the BukhMI (number of the State Registration ....)

4. THE DEGREE OF KNOWLEDGE OF THE PROBLEM.

Ischemic stroke is a growing medical, social and economic problem, the scope of which is acquiring the features of an epidemic (Graeme J.H., 2016). Despite the relatively stable incidence rates and a decrease in the mortality rate over the past two decades, there has been an increase in the number of life years adjusted for disability and deaths associated with stroke (Feigin V.L. et al., 2014).

Despite the undoubted achievements in this area, the problem of the negative impact of neurological deficits on the effectiveness of rehabilitation measures, short-term and long-term prognosis, functional status and quality of life of patients does not become less significant. Dementia and stroke are often associated with each other, and this combination is associated

with higher mortality, worse recovery, increased readmission rates and increased economic costs (Kliper E. et al., 2016).

Currently, there are several goals in the fight for the survival of brain cells (Barbagallo S.G., 2011; Suslina Z.A., 2014): a decrease in glutamate expression, normalization of ion channels, restoration of phosphatidylcholine levels, and a decrease in arachidanic acid and other inflammatory mediators. The effects of the neuroprotective action of drugs (Afanasyev V.V. et al, 2009) are manifested in an increase in the resistance of brain cells to hypoxia and ischemia; correcting the level of cellular energy; improving blood supply to the brain; increasing the functional activity of neurons and glial cells; normalization of mediator imbalance.

Acute CS requires urgent medical care, combining the efforts of neurologists, therapists, neuroradiologists, and laboratory diagnostics specialists. Clinical studies have shown that rapid examination and immediate therapy can improve clinical outcomes in patients with stroke [Sacchetti A. et al., 2013; Markaki I. et al., 2013]. The stratification of risk factors for adverse events in CS remains imperfect, despite a large number of studies to predict the clinical outcomes of stroke. In this regard, it is quite important to identify biochemical markers of the unfavorable clinical course of cerebral infarction, which can be a useful addition to improving the prediction of the outcomes of acute cerebrovascular catastrophe.

Lack of knowledge about the ways of formation of the therapeutic effects of combined neuroprotective therapy, depending on the severity of clinical manifestations of CS, indicates the relevance of this study. The above provisions make it possible to formulate the goal and objectives of this work.

5. PURPOSE OF THE STUDY:

development of new approaches to improving the efficiency of managing patients in the acute period of CS based on more accurate diagnosis, predicting its course and outcomes, as well as optimizing neuroprotective therapy.

6. RESEARCH OBJECTIVES

1. To compare the score of the severity of CS in the acute period with the outcome of the disease in the first three weeks to develop models for predicting outcomes;

2. To assess the neurological status of patients with CS in the most acute and acute periods;

3. To assess the dependence of the probability of CS outcomes on the characteristics of its focus according to neuroimaging data;

4. To assess endothelial function in CS (von Willebrand factor and endothelin-1)

5. To study the level of hemostatic (D-dimer) and biomarkers of inflammation (C-reactive protein) in CS;

6.Based on the results of modeling, propose an algorithm for managing a patient in the acute and acute period of CS

7. To determine the information content of monitoring the severity of CS to predict its outcome, to identify clinical and prognostic features in the acute and acute period of the disease.

8. To optimize approaches for the prevention of extracerebral complications in the acute and acute periods of CS using neuroprotective therapy.

7. OBJECT OF STUDY.

The study will be based on the data of a prospective analysis of clinical examination and treatment of 160 patients with CS. By the method of simple randomization, patients will be divided into the main and control groups, who received different treatment regimens.

The criteria for the inclusion of patients in the study were: IS, the most acute and acute periods, the ability to perform locomotor functions and psycho-neurological tests. All patients at the time of examination were conscious and were available for verbal contact. The study was carried out with the consent of the patients and did not contradict generally accepted ethical standards.

85 patients of the main group received basic and combined neuroprotective therapy. Basic therapy for ischemic stroke included correction of blood pressure, maintenance of normovolemia, control of glycemia and body temperature, treatment of cerebral edema and nutritional support as indicated, use of anticoagulants and antiplatelet agents. Combined neuroprotective therapy consisted of the use during the first 15 days: Cytoflavin 10 ml (succinic acid 1000 mg, inosine 200 mg, nicotinamide 100 mg, riboflavin sodium mononucleotide 20 mg) on 5% glucose intravenously, once a day; gliatilin 1000 mg intravenously in a saline solution once a day; Actovegin 200 mg intravenously, once a day. Cytoflavin and gliatilin were administered in the first half of the day, Actovegin - in the second. From the 16th day until the moment of discharge, the patients continued to receive Cytoflavin.

75 patients of the control group received standard treatment, which included a basic therapy similar to the main group, and during the entire hospital period, neuroprotective therapy with ethylmethylhydroxypyridine succinate (Mexidol) or cytoflavin.

8. RESEARCH METHODS.

1. All patients on the first day of admission and in the course of treatment at regular intervals (on the 5th, 10th, 15th, 20th day) will be assessed their general condition, somatic and neurological statuses with the determination of the severity of neurological deficit;

2. In a comprehensive neurological study of patients with IS, we, taking into account the specificity and recommended indications, used several clinical assessment scales at once: Orgogozo, Scandinavian, Gusev and Skvortsova, Bartel and a modified Rankin scale. At the same time, the indicators of the rating scales were determined by us twice: at admission (the most acute period) and after 21 days (the acute period).

3. On the day of admission and on the 10th day, the levels of von Willebrand factor and endothelin-1, as well as D-dimer and CCP will be determined in the blood serum;

4. A statistical analysis of the results will be carried out with the inclusion of mathematical modeling.

9. EXPECTED SCIENTIFIC RESULTS AND THEIR NOVELTY.

Differences in the risks of developing extracerebral complications in CS will be established. A method for predicting CS will be proposed based on calculating the clinical and neurological coefficient, as well as on the basis of indicators of endothelial function, hemostatic and biomarkers of inflammation, which allows to assess the risks of developing cerebral complications of ischemic stroke.

Indications for combined neuroprotective therapy for CS in the acute period will be developed based on an analysis of its effectiveness. As a result of the study, on the basis of an integrated systematic approach, the concept of the acute period of CS will be developed as a complex system consisting of a complex of synergistic elements that allows predicting the characteristics of the course, complications and outcomes of the disease, including in the context of optimizing neuroprotective therapy.

10. THE PLAN OF THE RESEARCH WORK TO BE CARRIED OUT.

Stage 1: 2020-2021 - processing of literary sources and collection of material. Material processing, statistical calculations, analysis of results;

Stage 2: 2021-2022 - collection of material; Issue of articles and theses on the topic of the dissertation; Material processing, statistical calculations, analysis of results, compilation of pivot tables, calculation of correlations; Writing a thesis;

Stage 3: 2022-2023 - Approbation and defense of dissertation work;

Scientific advisers: D.T. Khodjieva d.m.s.
Applicant: Z.Kh. Nurova