

Impact Factor: 5.682

ISSN: 2181-0982
DOI: 10.26739/2181-0982
tadqiqot.uz/neurology

JNNR

**JOURNAL OF NEUROLOGY AND
NEUROSURGERY RESEARCH**



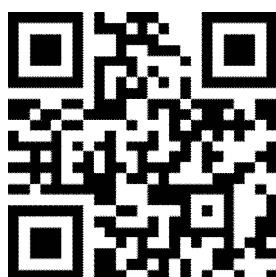
VOLUME 1, ISSUE 4
2020

ЖУРНАЛ НЕВРОЛОГИИ И НЕЙРОХИРУРГИЧЕСКИХ ИССЛЕДОВАНИЙ

ТОМ 1, НОМЕР 4

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Бухарский государственный медицинский институт и tadqiqot.uz

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Рецензируемый
научно-практический журнал
“Журнал неврологии
и нейрохирургических исследований”
Публикуется 4 раза в год
№4 (01), 2020
ISSN 2181-0982

Адрес редакции:

ООО Tadqiqot город Ташкент,
улица Амира Темура пр.1, дом-2.
Web: <http://www.tadqiqot.uz/>;
Email: info@tadqiqot.uz
Тел: (+998-94) 404-0000

Макет и подготовка к печати
проводились в редакции журнала.

Дизайн - оформления:

Хуршид Мирзахмедов

Журнал зарегистрирован
в Управлении печати и
информации г. Ташкента Рег. №
от 01.07.2020 г.

“Неврологии и нейрохирургических
исследований” 4/2020

Электронная версия

журнала на сайтах:

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JOURNAL OF NEUROLOGY AND NEUROSURGICAL RESEARCH

Bukhara State Medical Institute and tadqiqot.uz

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Peer-reviewed scientific and
practical journal "Journal of Neurology
and Neurosurgical Research"
Published 4 times a year
#4 (01), 2020
ISSN 2181-0982

Editorial address:

Tadqiqot LLC the city of Tashkent,
Amir Temur Street pr.1, House 2.
Web: <http://www.tadqiqot.uz/>;
Email: info@tadqiqot.uz
Phone: (+998-94) 404-0000

Layout and preparation for printing
held in the editorial office of the
journal.

Design – pagemaker:
Khurshid Mirzakhmedov

Journal is registered at the Office of
Press and Information Tashkent city,
Reg. No. July 1, 2020

"Neurology and neurosurgical
research" 4/2020

**Electronic version of the
Journal on sites:**
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ЛЕЧЕНИЕ ПАЦИЕНТОВ С ХРОНИЧЕСКОЙ ЦЕРЕБРОВАСКУЛЯРНОЙ НЕДОСТАТОЧНОСТЬЮ



<http://dx.doi.org/10.26739/2181-0982-2020-4-6>

АННОТАЦИЯ

Цель работы: улучшение результатов лечения больных с хронической сосудисто-мозговой недостаточностью путем применения различных методов диагностики и выбора адекватной хирургической тактики. У всех 49 (100%) больных I стадией хронической сосудисто-мозговой недостаточностью (ХСМН) в послеоперационном периоде отмечается значительное улучшение гемодинамических показателей, в течение отдаленного периода у больных I стадией ХСМН неврологических симптомов не наблюдалось. Из 120 (100%) больных II стадией ХСМН после хирургического лечения у 82 (68,3%) больных полностью исчезли симптомы нарушения чувствительности. В течение отдаленного периода повторных эпизодов транзиторных ишемических атак не наблюдалось. Из 187 (100%) больных III стадией ХСМН у в послеоперационном периоде (3-6 месяцев) у 115 (61,5%) больных отмечалось клиническое улучшение в виде отсутствия жалоб на головные боли, утомляемости и снижения памяти, у 27 (14,4%) больных они сохранялись. Показатель “инсульт + летальность” в этой группе больных составил – 2,3%. Из 332 (100%) больных ХСМН IV стадией в течение отдаленного периода у 11 (3,3%) больного наблюдался ишемический инсульт в оперированном каротидном бассейне с развитием летального исхода у 6 (1,8%). На 3-12 сутки послеоперационного периода у 5 (1,5%) больных развился острый инфаркт миокарда и явился причиной смерти у 3 из них.

Ключевые слова: брахиоцефальная артерия, каротидная эндартерэктомия, стеноз сонных артерий, атеросклеротическая бляшка, линейная скорость кровотока.

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TREATMENT OF THE PATIENTS WITH CHRONIC CEREBROVASCULAR INSUFFICIENCY

ABSTRACT

The work purpose: improvement of the treatment results of the patients with chronic cerebral vascular insufficiency by application of various methods of diagnostics and a choice of adequate surgical tactics. In all 49 (100%) patients with the first stage of the chronic cerebral vascular insufficiency (CCVI) in the postoperative period are marked considerable improvement of haemodynamic indicators, during the remote period in patients with the first stage of the CCVI neurologic symptoms were not observed. From 120 (100%) patients with the II stage of the CCVI after

surgical treatment in 82 (68,3%) patients have been completely disappeared symptoms of infringement of sensitivity. During the remote period of repeated episodes transitor ischemic attackst were not observed. From 187 (100%) patients with the III stage of the CCVI after surgical treatment in the postoperative period (3-6 months) in 115 (61,5%) patients were marked clinical improvement in the form of absence of complaints to headaches, fatigues and memory decrease, in 27 (14,4%) patients they remained. The indicator "stroke+lethality" in this group of the patients has been composed – 2,3%. From 332 (100%) patients with the IV stage of the CCVI during the remote period in 11 (3,3%) patients observed an ischemic stroke in operated carotid pool with development of a lethal outcome in 6 (1,8 %). For 3-12 days of the postoperative period in 5 (1,5%) patients the sharp heart attack of a myocardium has developed and was a cause of death in 3 of them.

Key words: brachiocephalic artery, carotid endarterectomy, stenosis of the carotid arteries, atherosclerotic plaque, linear speed of blood flow.

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СУРУНКАЛИ БОШ МИЯ ҚОН АЙЛАНИШИ ЕТИШМОВЧИЛИГИ БИЛАН ХАСТАЛАНГАН БЕМОРЛАРНИ ДАВОЛАШ

АННОТАЦИЯ

Тадқиқот мақсади: сурункали бош миЯ қон айланиши етишмовчилиги билан хасталанган беморларнинг даволаш натижаларини турли таххислаш усуллари ва адекват жаррохлик тактикасини ташлаш орқали яхшилаш. Сурункали бош миЯ қон айланиши етишмовчилиги (СБМҚАЕ) I босқичдаги барча 49 (100%) нафар беморда амалиётдан кейинги даврда гемодинамика кўрсаткичларининг яққол яхшиланиши аниқланди, узок муддатли кузатишлар давомида уларда неврологик белгилар аниқланмади. СБМҚАЕ II босқичдаги 120 (100%) нафар беморлардан 82 (68,3%) тасида жаррохлик давосидан сўнг сезги бузилиши белгилари тўлиқ йўқолди, узок муддатли кузатишлар давомида уларда қайта транзитор ишемик атака хуружлари кузатилмади. СБМҚАЕ III босқичдаги 187 (100%) бемордан 115 (61,5%) тасида амалиётдан кейинги даврда (3-6 ой) бош оғриғи, тез чарчаш ва хотира сусайиши каби белгиларни йўқолиши билан ифодаланган клиник яхшиланиш кузатилди, 27 (14,4%) нафар беморда ушбу белгилар сақланиб қолди. Ушбу гуруҳда "инсульт+ўлим" кўрсаткичи 2,3% ни ташкил этди. СБМҚАЕ IV босқичдаги 332 (100%) нафар беморлардан узок муддатли кузатишлар даврида 11 (3,3%) беморда амалиёт ўтказилган каротид қон томир ҳавзасида ишемик инсульт кузатилди ва уларнинг 6 (1,8%) таси ўлим билан якунланди. Бундан ташқари амалиётдан кейинги даврнинг 3-12 суткаларида 5 (1,5%) нафар беморда ўткир миокард инфаркти ривожланиб, бу ҳолат яна 3 нафар беморнинг ўлимига сабаб бўлди.

Калит сўзлар: брахиоцефал артерия, каротид эндалтеректомия, уйқу артериялари стенози, атеросклеротик пиллакча, қон оқими чизикли тезлиги.

INTRODUCTION

Prevention and treatment of the acute disturbance of the cerebral circulation (ADCC) is the major medical-social problem and has big social and economic value [1, 2]. It is known, that among all kinds of the ADCC prevails an ischemic cerebral affection. According to international multicentral researches, the ratio of the hemorrhagic and ischemic stroke averages 5:1, i.e. 80-85% and 15-20% accordingly [3, 4]. It is necessary to underline catastrophic consequences of an ischemic stroke (IS) – 80% of patients remain invalids, lethality in the sharp period is 29%, by the end of the first year reaches up 59%. Among the survived patients the repeated stroke develops in 5-25% within the first year, within 3 years – in 18%, and after 5 years – in 20-40% [5, 6]. Probability of a lethal outcome and physical inability in repeated IS above, than at the first. The number of invalids in consequence of strokes exceeds now 2 million. From them about 15% require a permanent care in hospital conditions or houses for aged and 30-40% cannot perform daily work without the aid of members of a family or guardians. The stroke changes a life not only those who has transferred it, but also their relatives or those who take care of them. Considering it, the general damage from a stroke in the USA estimates more than 29 billion dollars, and for one patient it makes almost 100 thousand dollars a year [5, 7].

In the USA only heart disease advances a stroke as the reasons of long invalidity and death. Nevertheless, according to recently spent sociological interrogation, only 1% of the population know that a stroke – one of the principal causes of death. Though death rate gradually decreases in process of population ageing, disease of a stroke remains in former level or even grows [7].

A pathology of branches of arcus aortae register in 4,2-15,2% of the population in the age of 40-60 years, in half from them disturbance of patens of carotids is observed from both parties. With the years frequency of stenoses of carotids sharply increases and in 70-76 years composes 82% in men and 79% in women, the risk of occurrence of an ischemic stroke and death from it for people with bilateral defeats by stenoses of carotids reaches 74% [9].

Principal cause of ADCC is the atherosclerosis and others stenosing defeats of brachycephalic arteries [10]. Timely diagnostics of the given pathology allows to reveal and warn disturbances of cerebral haemodynamics. Now in the world practice for revealing of brachycephalic arteries pathology it is applied ultrasonic duplex or triplex scanning, computer or magnit-resonans angiography [11, 12].

Atherosclerotic defeats of brachiocephalic arteries are one of the main reasons of acute and transient brain circulation disorders. Bilateral atherosclerotic defeats are more usual then isolated. The most saved and effective method of preventing the stroke which is caused by atherosclerosis of carotid arteries is carotid endarterectomy. It is steel important, to research hemodynamic in brain vessels before planning intervention [8].

Despite diagnostics of rapid development, and surgical treatment of the patients with chronic cerebrovascular insufficiency there are a number of unresolved problems in angioneurology. Diagnostics and tactics of the surgical treatment, patients with cerebral vascular insufficiency remains rather actual, definitively unresolved problem of modern vascular surgery and, certainly, demands the further researches and new workings outs. Primary preventive maintenance is necessary for reduction of quantity and simplification

of consequences of a stroke with early revealing and correction of risk factors, and also secondary preventive maintenance of repeated strokes.

The purpose of the given work was improvement of results of treatment of patients with chronic cerebral vascular insufficiency (CCVI) by application of various methods of diagnostics and a choice of adequate surgical tactics.

MATERIAL AND METHODS

We have following clinical experience from 2018, till November 2019 in the department of angioneurology of the

Republican Specialized Center of Surgical Angioneurology have been performed 786 reconstructive operations on carotids in 688 patients (in 98 patients stage by stage are executed carotid endarterectomy (ECE) from both parties). Reason of CCVI in 463 (67,3%) cases were atherosclerotic lesions of brachycephalic arteries (BCA), in 9 (1,3%) cases extravascular compression of an internal carotid. At the same time it is noted high frequency of pathological deformation of the carotids, observed in 126 (18,3%) cases, and its combination to a stenosis is noted in 74 (10,8%) cases. In 16 (2,3%) patients of the reason occlusion process were nonspecific aortoarthritis. In 224 (32,6%) patients were multifocal defeats (tab. 1).

Table 1.

Multifocal defeats of vessels		
Localization of defeat of arteries	Number of patients	%
Carotid + renal	49	7,1
Carotid + lower extremities	97	14,1
Carotid + renal + lower extremities	34	4,9
Carotid + coronar	31	4,5
Leason of 4 arterial pools	13	1,9
Total	224	32,6

From 688 patients included into our research 486 (70,6%) were man, 202 (29,4%) – a female sex. Their age fluctuated from 24 till 83

years, on the average $57,1 \pm 7,3$ years, the majority of patients were able-bodied age (fig. 1.).

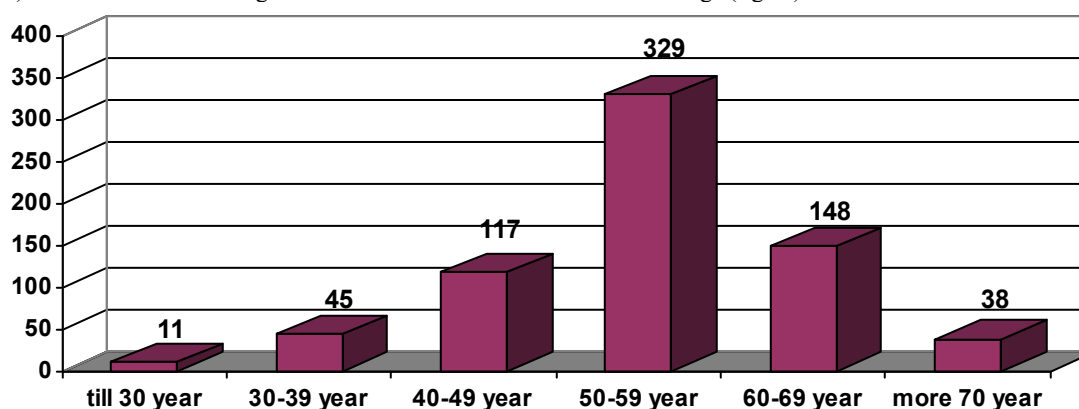


Fig. 1. Distribution of patients by age groups.

The diagnostic algorithm of examination included clinical examination of the patients with definition of the neurologic status ($n=688$), ultrasonic dopplerography (USDG) with scoping and the hemodynamic importance of leason ($n=525$), duplex scanning with definition of degree of a stenosis and speed of a blood-flow, character and embolism of the plaques ($n=587$), echocardioscopia ($n=258$), computer tomography of a brain ($n=312$), is computer-tomographyc angiography ($n=483$), magnet-resonant angiography ($n=59$) and rengencontrast angiography ($n=68$). It is necessary to notice, that last years with the advent of possibility to spend qualitative duplex examination of the patients and it is computer-tomography angiography performance of roentgencontrast angiography it is made only under strict indications – in patients with nonspecific aorta arthritis, in multifocal leason and when angiography from diagnostic research can pass in medical (catheterization of the arteries for long intra-arterial catheter therapies in critical ischemia of the lower extremities, angioplastics and stenting).

Majority of the patients had such associated pathologies such as an arterial hypertension – 487 (70,8%), diabetes – 111 (16,1%), ischemic heart disease – 243 (35,3%), from them 63 (9,2%) have had in the anamnesis an acute infarct myocardium. For an estimation of neurologic symptoms we considered indicators of disturbances of coordination, sensitivity, and also visual impairment, noise in ear and in a head, fatigue, working capacity and memory decrease. In patients transferred ADCC estimated volume of movements, muscular force and rate of movements by the standard techniques (adapted scale MRC in points). Thus easy hemi paresis corresponded to 4-5 points, moderated – to 3-4 points, sever – to 0-2 points.

RESULTS AND DISCUSSION

In conformity of classification of A.V. Pokrovsky (1979) symptom course (I stage CCVI) diseases were observed in 49 (7,1%) patients, transitor ischemic attacks (TIA) – in 120 (17,4%), dyscirculator encephalopathy – in 187 (27,2%), and 332 (48,3%) patients had earlier an ischemic stroke.

Carried out investigation has revealed the isolated leason of one carotid in 154 (22,4%) cases, bilateral – in 236 (34,3%), and plural defeat ICA – in 298 (43,3%).

In 331 patients the stenosis of carotids was more than 70%, in 143 – a stenosis less than 70%, in 58 – is revealed occlusion of one common carotid artery (OCCA), in 5 – bilateral occlusion ICA and in 4 – occlusion of the general carotid (OGCA). It is necessary to notice, that in 52 patients occlusion of the ICA it was combined with a stenosis of an external carotid (ECA). In 21 patients pathological deformation ICA was combined with pathological deformation the OGCA. At studying of character of atherosclerotic plaques (AP) but classifications Gray-Weale it is noticed, that in 72,5% of cases are revealed II and III type AP and in 27,5% of cases it was observed complicated AP.

Indications to performance of carotid endarterectomy in atherosclerosis for symptomatic leasons (TIA or after ADCC) were – all types of plaques narrowing a vessel gleam on 60% and more, noticed plaques with a stenosis of 50% and more. For asymptomatic leasons – the homogeneous plaques narrowing gleam of a vessel on 70% and more, heterogeneous and hypoechogen, noticed plaques with a stenosis of 60% and more. At pathological deformation by indications to

operative treatment were presence of symptoms of cardio vascular insufficiency and significant hemodynamic infringement on carotids.

For definition of tolerance of a brain to an ischemia we spent Mataka compression test, observing thus behind the neurologic status of the patient and studying linear speed of a blood-flow on an middle brain artery, and also electric activity of a brain. At carrying out of test Maraca in 536 cases it is noted high degree of tolerance of a brain to an ischemia, in 127 – satisfactory, in 11 – low, in 14 – critical.

All patient before and after the operation were introduced anticoagulants subcutaneously, also in infusion program included the preparations improving blood rheology and cerebroprotectors. In 25 cases in low and critical tolerance of a brain it is used clearance shunt. Reconstruction of carotids were made not earlier than 4 weeks from the beginning of sharp disturbance of cerebral circulation, and in "small" strokes – in 2-4 weeks, after TIA – in some days, hours and even is emergency, depending on character of a plaque. At a choice of a carotids reconstruction method considered character of lesion, in particular, degree and extent of occlusive process and degree of tolerance of a brain.

Following kinds of operative interventions are executed: classical endarterectomy CEE with expanding patch in 337 cases, eversion КЭАЭ – in 147, resection ICA with redressation and reimplantation in an old opening – in 145, a resection and bandaging ICA + endarterectomy from ECA with imposing of an expanding patch – in 49, eversion classical endarterectomy CEE + resection ICA with redressation – in 76, a resection the GCA with redressation the GCA and ICA – in 9, endarterectomy from carotids + carotid - subclavicular shunting – in 6, a resection the GCA with prosthetics –

in 4, aorta-carotid shunting – in 2, per arterial sympatectomia – in 3 and removal chemodectomas – in 8 cases.

After performance of reconstructive operation we estimated dynamics of neurologic symptoms and hemodynamic changes for 8-10 days, in 2-18 months.

In all 49 (100%) patients in the postoperative period by I stage CCVI considerable improvement of hemodynamic indicators are marked, namely linear speed of a blood flow (LSBF) on ICA with initial $160 \pm 12 \text{ cm/s}$, has decreased to $74 \pm 5 \text{ cm/s}$ ($t=3,1$; $p<0,05$). During the remote period in patients by I stage CCVI it was not observed neurologic symptoms.

From 120 (100%) patients with the II stage CCVI (transitor ischemic attacks in the anamnesis) in all were initial complaints to disturbance of sensitivity in the form of sensation stupor, ant crawlings, pricking, arising on limited sites of the skin of the lower extremities.

In 44 (36,7%) patients in throw back of heads there was a veil before eyes back, photopsia and timely loss of sight, in 79 (65,8%) patients in admission was observed right-hand hemiparesis and aphasia. After surgical treatment in 82 (68,3%) patients have completely disappeared symptoms of disturbance of sensitivity, in 38 (31,7%) they remained for account of 2 foreign lesions, the patient with sight infringement during change of position of a neck did not show complaints. (tab. 2, 3.). During the remote period of repeated episodes TIA and progressing CCVI in the operated pool it was not observed. Linear speed of blood flow (LSBF) at the given category of patients with initial $174 \pm 16 \text{ cm/s}$, has decreased to $71 \pm 7 \text{ cm/s}$ ($t=2,8$; $p<0,05$).

Table 2.

Subjective complaints before surgical treatment

Symptoms	CCVI II st.		CCVI III st.		CCVI IV st.	
	before	after	before	after	before	after
Dizziness	64	36	111	26	197	48
Pain intemporo-parietal area	83	19	89	18	237	93
Pain in occipital region of head	67	14	74	9	95	31
Noise in a head	74	21	81	19	79	28
Ear noise	48	23	35	18	52	40
Numbness of hands and feet	103	-	68	21	278	57
Short term loss of consciousness during a change of a head position	15	3	1	-	7	2
Shroud before eyes, photopsia and timely loss of sight	44	7	44	16	28	9

Table 3.

Neurologic symptoms before and after surgical treatment

Symptoms	CCVI II st.		CCVI III st.		CCVI IV st.	
	before	after	before	after	before	after
Nystagmus	47	3	49	12	77	22
Central paresis of VII nerve	113	-	63	15	328	278
Central paresis of XII nerve	91	-	59	16	124	43
Bulbar disturbances	-	-	-	-	63	46
Motional disturbances	79	-	-	-	303	179
Disturbance of sensitivity	118	-	-	-	189	73
Motor aphasia	34	-	-	-	74	14
Sensorial aphasia	20	-	-	-	42	9
Cerebellar aphasia	-	-	9	4	31	19

From 187 (100%) patients of the III stage of the CCVI in 163 (87,2%) were complaints to a headache localized in occipital, temporal and parietal area on the party of defeat and sensation of "a heavy head", all patients had undue fatigability and working capacity decrease. In the postoperative period (3-6 months) in 115 (61,5%) patients were marked clinical improvement in the form of absence of complaints to headaches, fatigues and memory decrease, in 27 (14,4%) patients they remained (tab. 2, 3.). Improvement regional hemodynamic is also noted. According to duplex scanning linear stream of blood flow LSBF on ICA after operation has decreased with $181 \pm 9 \text{ cm/s}$ to $79 \pm 7 \text{ cm/s}$ ($t=2,1$; $p<0,05$), i.e. to norm. In 3 (1,6%)

patients within 6 months has occurred hemorrhagic stroke in not operated carotid pool against high not corrected AP, with a lethal outcome. In 6 (3,2%) patients in the nearest postoperative period have developed ADCC on ischemic type in operated carotid pool, in 4 (2,3%) from them were lethal outcome (an indicator "a stroke + lethality" – 2,3 %). In conformity with scale MRC from 332 (100%) patients of IV stage CCVI in 208 (62,7%) was hemiparesis of light degree, in 92 (27,7%) moderated hemiparesis and in 32 (9,6%) patients were available hemiparesis of heavy degree.

The analysis of the latest results of operative treatment has shown, that from 208 patients with light degree of hemiparesis in 153

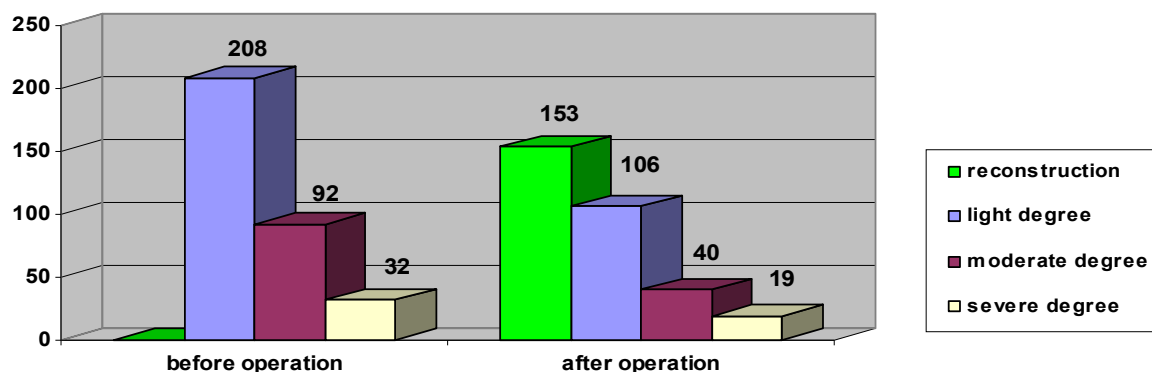
(73,6%) for 3-6 months after operation are marked full restoration of impellent infringements, speech and sensitivity infringements.

In group of patients with moderated hemiparesis from 92 patients in 51 (55,4%) in terms of 3-12 months after surgical treatment were marked restoration of neurologic deficiency, and they could be carried in group of patients with a lung hemiparesis, full restoration of

neurologic symptoms in the given category of patients was not observed.

In 9 (28,1%) patients from a category of the patients with hemiparesis heavy degree reduction hemiparesis to moderated degree is marked, in 23 (71,9%) recourse are noted (fig. 2.) (tab. 2, 3.). LSFB linear stream of blood flow on ICA with initial $178 \pm 6 \text{ cm/s}$, has decreased to $69 \pm 6 \text{ cm/s}$ ($t=2,4$; $p < 0,05$).

Fig. 2. Changes of the neurologic status of the patients with the IV stages CASD after reconstructive operation in 12 months (n=332).



From 332 (100%) patients with the IV stage of the CCVI during the remote period in 11 (3,3%) the patient observed an ischemic stroke in operated in carotid pool with development of a lethal outcome in 6 (1,8%) (an indicator “a stroke + lethality” – 1,8%). In 3 (0,9%) patients has developed hemorrhagic stroke in not operated carotid pool. For 3-12 days of the postoperative period in 5 (1,5%) patients the sharp heart attack of a myocardium has developed and was a cause of death 3 of them.

For the observable period in the operated patients following complications were observed: CCVI on ischemic type in operated carotid pool in 25 (2,6%) patients, in 11 (1,6%) from them were a lethal outcome. False carotid aneurysm has developed in 9 (1,3%) patients, a supuration of a wound in 3 (0,4%) patients, lymphrea in 1 (0,15%) the patient, a sharp thrombosis in the early postoperative period in 6 (0,9%) patients, bleeding from a wound in 9 (1,3%) patients, damage of cranial nerves in 16 (2,3 %) patients (damage of the bottom branches VII pair of cranio-cerebral nerves in 2 patients, IX-X nerve pairs - in 4, XII nerve pairs - in 10 patients), restenosis in 23 (3,3%) patients, transitor ischemic attacks after rengencontrast angiography in 6 (0,9%) patients.

The majority of the specified complications it is noted in an initial stage of work of the department, with accumulation of experience the quantity of complications and lethality has considerably decreased. It is necessary to notice, that recourse of neurologic deficiency was observed even at blood-flow restoration through an external carotid.

In works of leader angiosurgeons is widely discussed advantages and lacks of operative treatment of the patients with chronic cerebral vascular insufficiency, but the fact of efficiency of vascular reconstructive operations in respect of preventive maintenance of the development of ischemic strokes in this category of patients already by whom in the world it is not challenged. Only separate questions on indications and contra-indications, methods of diagnostics, rehabilitation of patients and private questions of techniques of operative interventions are discussed. Lately appear more and more works proving clinical efficiency of these operations in patients who had ischemic stroke [10, 13].

Possessing considerable own experience of operative treatment about 700 patients we have reconsidered all tactics of conducting and treatment of the patients with chronic cerebral vascular insufficiency in various stages of the development of disease. Medicamentous therapy till today has not led to reduction of development of ischemic strokes in human population, and also has not reduced frequency of heavy complications and consequences of this disease. It is represented to us,

that a unique method of high-grade treatment of the CCVI is surgical. Correction of the broken blood-flow in carotid pool not only allows to warn an ischemic stroke, but also is a method of a choice for rehabilitation of patients who already had an ischemic stroke, and also having neurologic deficiency. There should be a tendency to diagnose and operate patients in asymptom stages, for the prevention of development of strokes and TIA. In the beginning of our work of operation in patients with CCVI of the I degree made 6 %, for today there is an insignificant growth – 7,1% whereas in the countries of Europe and the USA this indicator makes 40-72% [3, 7].

CONCLUSIONS

We consider, that the maximum approchement of interaction of services of emergency service, and planned neurology, blocks of intensive therapy, otorinolaringologists, oculists, cardiologists and surgeons today is necessary.

All patients who have had a stroke, TIA or suffering vertebral-basilar disturbances, patients whom it is listened systolic murmur in BCA there is gradient asymmetry of the AP between hands from above 20mm hg is available infringements, patients, and also all patients who are older than 50 years with other vascular defeats (IDH, the arterial hypertension, aorta aneurysms, chronic ischemia of lower extremities CILE) should pass without fail complex tool examinations for revealing or an exception of defeats BCA. At acknowledgement of the diagnosis of the patients should be necessarily directed and examined the vascular surgeon for the decision of a question on medical tactics. Thus the doctor of any specialty should know that the ischemic stroke is only complication of some pathology. It is necessary to understand clearly also and that without elimination of the reason which have led once to a stroke or transitor ischemic attack, the probability of the subsequent ischemic damages of a brain remains very high and remains constantly. It is inexpedient without surgical elimination of the verified reason of already transferred ischemic stroke or TIA to direct patients on rehabilitation treatment in neurologic and therapeutic departments of hospitals.

It is necessary constant informing of doctors of the general practice, otorinolaringologists, oculists, cardiologists, therapists and neurologists about modern approaches to diagnostics and treatment of patients CCVI in courses of improvement of qualification of doctors.

Has been appeared sharp necessity of creation of the uniform of national register in the Republic for ordering and unification of diagnostics and treatments of the patients with acute and chronic disturbances of cerebral circulation.

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ЖУРНАЛ НЕВРОЛОГИИ И НЕЙРОХИРУРГИЧЕСКИХ ИССЛЕДОВАНИЙ

ТОМ 1, НОМЕР 4

JOURNAL OF NEUROLOGY AND NEUROSURGERY RESEARCH

VOLUME 1, ISSUE 4

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