The use of manual therapy in the treatment and rehabilitation of post-traumatic cerebro vascular disorders

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Manual therapy in treatment and rehabilitation of posttraumatic cerebrovascular disturbances

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SUMMARY

The article describes the clinical application of manual diagnostic and therapeutic techniques (visual diagnostics, craniometry, release, PIR, craniosacral technique) in patients with distant cerebral hemodynamic disorders of head injuries. The effectiveness and safety of manual therapy techniques in the rehabilitation of a group of patients has been confirmed. A modulating cerebrovascular effect has been proven at various stages of the consequences of head injuries, which confirms the feasibility of identifying various pathobiomechanical variants of craniofacial asymmetry in rehabilitation after head injuries.

Key the words: consequence cranial trauma, post-traumatic cerebrovascular disorders, manual therapy.

RESUME

The article describes the clinical application of manual diagnostical and therapeutical techniques (visual diagnosis, craniometry, release, PIR, cranio-sacral technique) in patients with distant disturbances of cerebral hemodynamics after head injuries. The efficacy and safety of manual therapeutic techniques in rehabilitation of trauma patients is confirmed.

Modulating cerebrovascular effect at different stages of the consequences of head injury is proved, that confirms the feasibility of isolating different pathobiomechanical options of craniofacial asymmetry in rehabilitation after head injury.

Keywords: consequences of craniocerebral trauma, posttraumatic cerebrovascular disturbances, manual therapy.

The problem of treatment of post-traumatic cerebrovascular disorders (PCVD) is one of the urgent problems of modern medicine, given the frequency of head injuries and their long-term consequences in the modern world [7, 13]. It is believed that PCVIs occur in 46–78% of patients with head trauma, minor traumatic brain injury (TBI). Among this group of patients from 72.5% to 100% in the history there is information that they had a mild closed head injury.

It is believed that with traumatic brain injury, the central regulation of all systems and organs is disturbed, and, in particular, the autoregulation of cerebral blood flow. In these conditions, prerequisites are created for the development of disorders of autonomic homeostasis. Disturbances in the metabolism of the brain and the autonomic nervous system aggravate the disturbances in hemolikvorodynamics, form various variants of clinical manifestations in the acute and long-term periods [10].

Numerous diagnostic and rehabilitation techniques are aimed at identifying and eliminating vascular and CSF-dynamic pathogenetic mechanisms. At the same time, with rare exceptions, the tissues of the skull itself, the spine and their pathobiomechanical properties remain outside the field of view of researchers [3, 15]. As a result of acute and / or chronic

trauma to the skull, neck and irritation of the proprioreceptive zones of the sutures, scalp and / or dura mater. The latter, in the future, leads to inhibition of the stretch reflex of skeletal muscles, violations of hemolikvorodynamics (hypertension), the formation of myofascial hypertonicity of the muscles of the head, neck, collar zone, pelvic region, changes in the microcirculation of the conjunctival membrane, iris of the eye, violation of the patient's statics as a whole [2, 4 , 5, 12]. Manual therapy methods in the rehabilitation of this category of patients are used extremely insufficiently [1, 8, 9].

The purpose of our study was to study the possibility of screening diagnostic techniques PCVN for assessing the effectiveness of rehabilitation using various techniques of manual therapy.

Materials and methods

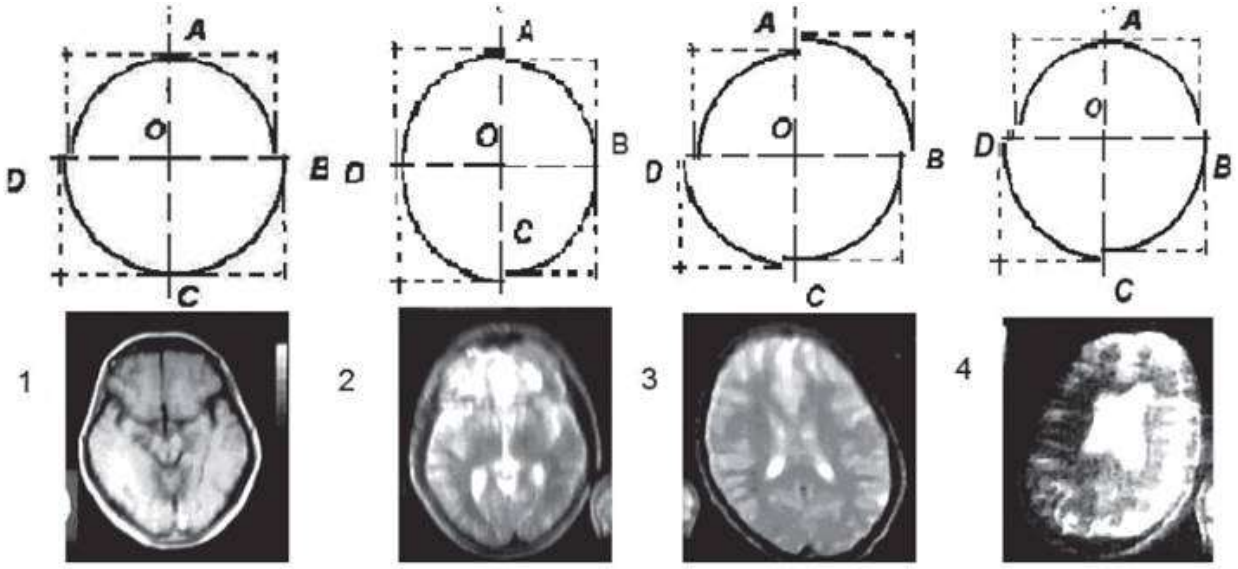
55 patients from 12 to 35 years old were examined: 25 people in the experimental group (EG) and 30 in the control group (CG), who had subclinical manifestations of PCVI, who had a history of TBI. The following were used for the examination: clinical anamnestic examination, psychometry, rheoencephalography, electroencephalography, MRI-graphy, bulbar bimicrophotography and iridography on a SL-62 slit lamp with a digital apparatus "Olimpus" with subsequent image processing in the program "Photoshop" (overlaying a calibration grid), cranikephalometry and cephalography, pulse variational cardiointervalometry on the Biotemp biofeedback apparatus (Research Institute of Medical Cybernetics and Biophysics, Novosibirsk, 2006).

As a result of the work carried out, it was found that all patients had a burdenedtraumatic history, and 78.6% of them received previous treatment for various pathologies of the central nervous system. The period from the first manifestations of the disease in the form of complaints of headache, fatigue, tendency to constipation, increased fatigue, irritability, pain in the region of the heart, head, back ranged from 7 days to 15 years in this group. When examining the state of muscle tone and cerebral hemolikvorodynamics, changes were noted in 68.9% ± 0.1. The study of the tonic-power balance of the musculoskeletal system revealed in all patients visual cosmetic asymmetry, violations of the static-dynamic stereotype, a decrease in the stretch reflex in the muscle groups of the face, neck, diaphragm, upper limb, pelvic floor, lower leg.

In this group of patients, there was craniofacial asymmetry, i.e. asymmetry of the cerebral and facial skull. There is a correlation of flexion, lateroflexion, rotational, combined clinical picture with craniofacial asymmetry. Craniometric, visual pathobiomechanical variants were established: flexion, lateroflexion, rotational, combined, which correlated with the indicators of cerebral hemolikvorodynamics and with disturbances in the tone of the autonomic nervous system, obtained during the production of variational pulsometry.

Magnetic resonance imaging revealed in this group of patients scanty changes: minor signs of cerebrospinal fluid hypertension (expansion of the subarachnoid cerebrospinal fluid spaces, asymmetric perfusion of brain tissue). The analysis of the MRI image by the calibration grid method in Photoshop corresponded to the craniometric data.

The predominance of the length of a certain sector of the hemisphere of the head by more than 10% of the length of the contralateral one, allowed us to identify the clinical and pathobiomechanical variants of "craniofacial asymmetry": flexion-extension (7.5%), lateroflexion (27.5%), rotational (20.0 %) and combined (45.0%) (Fig. 1).

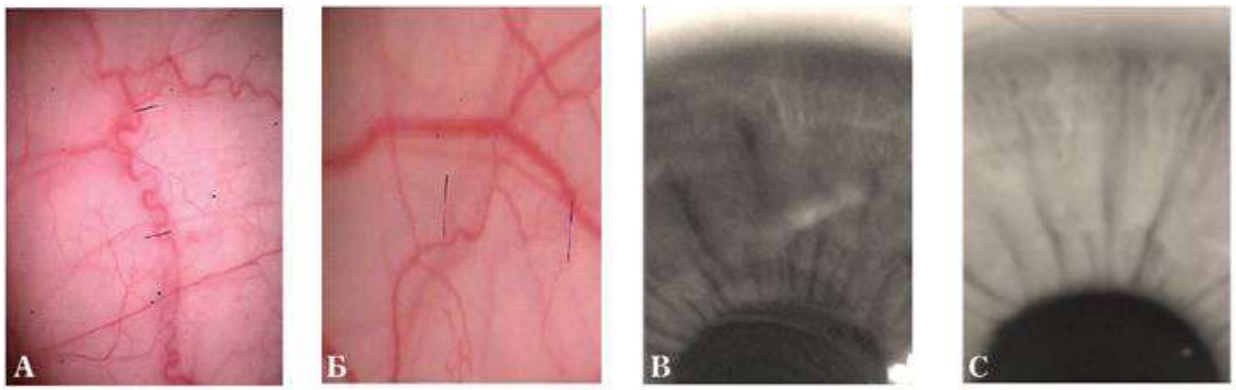


Rice. 1. Pathobiomechanical variants of "craniofacial asymmetry" (top view).1 - flexion-extension (anterior-posterior sector), 2 - latoflexion (lateral sectors), 3 - rotary (diagonal sectors), 4 - combined

Evaluation of MRI studies in subjects with different pathobiomechanical variants revealed various diffuse decreases in cerebral blood flow both in the cortical regions and in various regions of the white matter of the brain, parietal, frontal and temporal lobes. At the same time, the decrease in cerebral perfusion was predominantly of a venous mosaic character, which resembled subclinical changes, as in chronic CMC. The changes in CSF dynamics were not expressed in all patients.

During instrumental studies (Fig. 2) by the method of bulbar bimicroscopy and iridography, various signs of hemodynamic disturbances in the microvasculature of the internal carotid artery (venous stasis, vascular looping, sludge, lacunae, grooves) were noted. The pathobiomechanical variants of PCVN established by craniometric studies, visual examination and manual diagnostics dictate the need for a targeted therapeutic effect on various links in the pathogenesis of the disease by various manual techniques.

For the rehabilitation of this group of patients, we used complex treatment in the form of soft tissue and myofascial release and craniosacral techniques, post-isometric relaxation, exercise therapy. The method of craniosacral manual therapy was chosen because it is a natural method of restoring the biomechanics of the skull and the entire musculoskeletal system by affecting hemolytic dynamics, the system of muscles, ligaments, cranial sutures, and joints of the upper region of the spine.

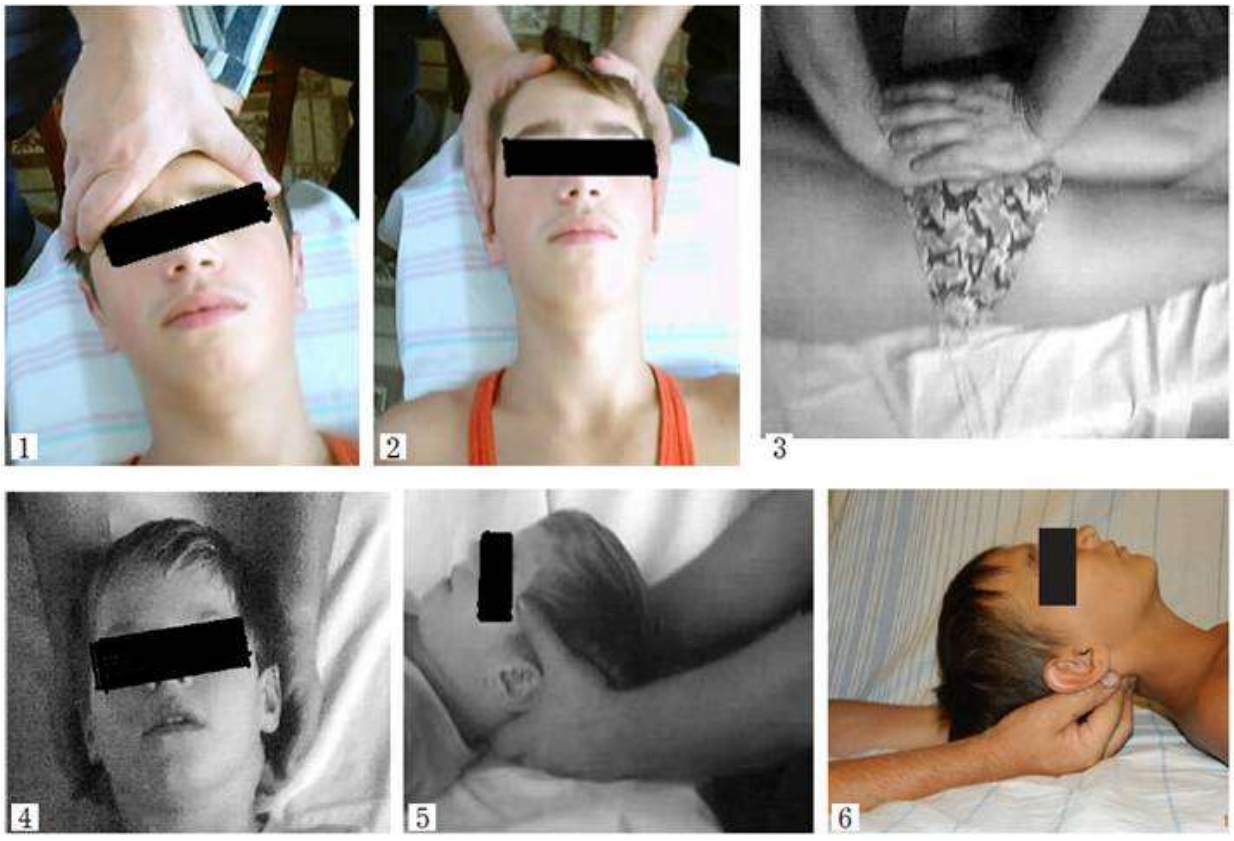


Rice. 2. Bulbar bimicroscopy (a) and patient iridography19 years with the consequences of TBI (A, B) - there is venous stasis on the conjunctiva, vascular looping, microaneurysms, sludge, (B, C) - closed lacunae, age spots and grooves of hyperemia in somatotopic zone of the brain (according to Deco).

We performed manual therapy on the skull using the CV4, V-spread technique. The procedures were performed on an outpatient basis 2–3 times a week, 5–8 times per procedure. The technique of relaxation of the sutures of the skull, detorsion of the dura mater according to Sutherland was previously carried out [14]. The choice of MT techniques was determined, on the one hand, by the polyvalent nature of the therapeutic action (psychotropic, vegetotropic, analgesic, local trophic, muscle relaxant), and, on the other hand, by safety with prolonged and repeated use. PIR was used to reduce tonic muscle tension. The impact was carried out on the muscles of the scalp, neck, abdominal diaphragm and was prescribed to all patients with PCVN in parallel with MT in the amount of 6-8 sessions per course of treatment. Patients were taught PIR techniques for self-administered procedures during the day. In patients with PCVN, the most effective was the effect on the following acupressure points: GI4, GI11, E36, MC5, MC6, TR5, VB41, VB20, VB21, T14, T19, T20. MT techniques were applied in accordance with generally accepted rules [3, 6, 8, 11]. No drug and physiotherapeutic treatment was prescribed in the EG.

Comparison of treatment results showed that the greatest percentage of positive effects was observed in patients with flexion-extension and rotational variants of cranial asymmetry - 64.2% of cases; with combined - in 28.5% of cases.

The revealed clinical effect was determined after the 2-3rd procedure and further increased, reaching a maximum by the end of the course of treatment, consisting of 4-6 procedures, lasting 2-4 weeks. It was noted that the use of this technique was more effective in females (85.7%).



Rice. 3. Healing manual techniques:
1. Frontal and occipital grip, 2. Main grip. 3. Release of the sacrum. 4. Technique CV4. 5. Relaxation sutures of the skull according to Gikhin. 6. Occipital release

In the observation groups, normalization of cerebral hemoliquorodynamics, autonomic homeostasis (Table 1), normalization of muscle tone, indicators of physical performance, and quality of life were noted. The duration of the improvement ranged from 8 months. up to 1 year. The clinical effect was expressed in the relief of cephalgic syndrome, a decrease in "craniofacial asymmetry", a decrease in the level of anxiety and autonomic imbalance, the normalization of the stretching reflex in previously hypotonic muscles, and the normalization of cerebrospinal fluid dynamics. This is confirmed by clinical and laboratory instrumental studies.

Table 1

Dynamics of clinical indicators in the EG and CG before and after rehabilitation (p <0.05)

ПОКАЗАТЕЛИ	ЭГ		КГ	
	До	после	До	после
Тревожность по тесту Люшера	7,6 ± 0,2	3,7 ± 0,2	7,8 ± 0,2	5,7 ± 0,2
Головная боль (по ВАШ), (p <0,05)	5,7 ± 0,2	1,0 ± 0,2	5,5 ± 0,2	3,0 ± 0,2
Работоспособность по тесту САН	снижена	нормальная	снижена	нормальная
ЧСС, уд./мин.	63 ± 8	73 ± 6	65 ± 8	64 ± 6
АДС, мм рт. ст.	110± 8	120 ± 8	100 ± 8	110 ± 8
Вегетативное равновесие,	ваготония	нормотония	ваготония	нормотония
Краниометрическая асимметрия, коэфициент	> 0,85 ± 0,1	0,89 ± 0,1	> 0,89 ± 0,1	0,90 ± 0,1
Показатели асимметрии гемодинамики, Δ	> 30 %	> 10 %	> 32 %	> 16 %
Показатели межполушарной асимметрии, ЭЭГ	69,6 %	25,9 %	79,6 %	55,9 %

We believe that the clinical effect of manual therapy methods on the manifestations of the sequelae of TBI is based on pathobiomechanical changes in the skull, the so-called. "Craniofacial asymmetry", dura mater, acute or chronic muscle strain, and subsequently to cerebral ischemia. The phenomena described above distort afferentation from tissues, lead to the formation of neurological disorganization and form cross myofascial pain syndrome, a violation of autonomic regulation. They are followed by cerebrospinal fluid dynamics, accompanied by headache. A suboptimal motor stereotype aggravates neurological disorganization and reduces the effectiveness of the rehabilitation process.

When assessing the regression of maladaptive syndromes after TBI according to the criteria of effective rehabilitation in patients of all observation groups, we formed 3 clinical groups: in group 1, a “good” result was obtained, i.e. complete regression, complete restoration of self-service, working capacity in the 2nd group - "satisfactory" result, i.e. insignificant regression, with limited working capacity and household activity, and in the 3rd group - "unsatisfactory" result, i.e. partial regression. The outcome of the rehabilitation of the observation groups is presented in table. 2.

The table shows that in the EG a "good" result was obtained in a larger number of observations, in comparison with the CG.

table 2

Outcome of treatment and rehabilitation measures in various observation groups

	1 (хорошие)	2 (удовлетворительные)	3 (не удовлетварительные)
ЭГ	40,0 ± 0,02 %	48,0 ± 0,022 %	14,0 ± 0,012 %
Итого	88,0 ± 0,01 %		
КГ	36,6 ± 0,02 %	36,7 ± 0,02 %	26,7 ± 0,022 %
Итого	73,3 ± 0,01 %		

conclusions

Usage possibilities manual therapy at treating patients with with post-traumatic vascular disorders, it expands the functional capabilities of the body and significantly improves the quality of life, the effectiveness of rehabilitation of patients after TBI with minimal time and pharmaco-economic costs. It is advisable to use manual techniques in the treatment of post-traumatic hemodynamic disorders: acupressure, release, craniosacral techniques.

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