

APPLICATION OF BLOW-WAVE THERAPY IN THE REHABILITATION OF PATIENTS COMPLICATED BY THE VERTEBRAL ARTERY IN CERVICAL RADICULOPATHY

Рамазанов Ш.Ф.¹

<https://orcid.org/0009-0009-0473-0506>

Высогорцева О.Н.²

<https://orcid.org/0000-0003-2857-6012>

¹Bukhara State Medical Institute named after Abu Ali ibn Sino ²Tashkent City "M-Clinic" Multidisciplinary Clinic.

Abstract.

Cervical radiculopathy is a common degenerative condition of the cervical spine that leads to persistent pain, functional limitations, and a decrease in quality of life, often complicated by vertebral artery involvement. The use of modern physiotherapeutic technologies, including shock wave therapy (SWT), is considered a promising direction in rehabilitation programs. The aim of this study was to evaluate the effectiveness of shock wave therapy in the rehabilitation of patients with cervical radiculopathy complicated by vertebral artery syndrome.

Keywords: cervical radiculopathy; vertebral artery syndrome; shock wave therapy; rehabilitation; cervical spine; chronic pain; physiotherapy.

Relevance: Cervical radiculopathy - a clinical condition caused by compression or irritation of one or more cervical roots due to degenerative changes in the spine. Cervical radiculopathy is characterised by pain radiating to one or both arms, accompanied by movement, reflex and sensory disturbances (including dysesthesia and paresthesia), without signs of spinal cord injury [1-3].

Cervical radiculopathy is a disability condition that has a significant negative impact on patients' physical activity, mental health, and social activity.[1] Neck pain is more often registered in women than in men, and its prevalence is in the same direction in both sexes, reaching its peak around the age of 50 (in women - 50-54 years, in men - 45-49 years) and subsequently decreasing [5].

Today, new high-tech methods of physiotherapy are actively used for the treatment of cervical radiculopathy, and one of such methods is shock wave therapy.

A shock wave is an acoustic wave possessing the kinetic energy of an axis generated by compressed air. The shock waves used here are extremely short, powerful pressure pulses with large pressure amplitudes and a small tensile component. They are formed outside the patient's body, enter the body, and have a therapeutic effect.

This, in turn, contributes to increased blood flow, analgesic effect, accelerated treatment, restoration of mobility, and increased collagen production. These abilities of the shock wave can be applied in degenerative diseases of the spine, in particular in the cervical spine[1].

The aim of the research is to study the impact of shock waves on the cervical spine in cervical radiculopathy and to assess the effectiveness of shock wave therapy in dynamics.

Materials and methods: 61 patients with cervical radiculopathy were examined in the neurology department of the Bukhara branch of the Republican Scientific Center for Emergency Medical Care. In the main group, 36 patients with cervical osteochondrosis underwent standard therapy and shock wave therapy. In the comparison group, 25 patients, in addition to standard therapy, underwent magnetotherapy, ultraphonophoresis, and cervical spinal massage.

Table 1

Distribution of patients by age and sex (n-61)

Gender / Age Group	21-39 years old	40-59 years old	≥65 years old	Total, n (%)
Men	8 (13,1 %)	10 (16,4 %)	7 (11,5 %)	25 (41,0 %)
Women	16 (26,2 %)	11 (18,0 %)	9 (14,8 %)	36 (59,0 %)
Total, n (%)	24 (39,3 %)	21 (34,4 %)	16 (26,3 %)	61 (100 %)

Among the examination methods, general clinical studies (complaints, anamnesis, objective examination, general blood analysis, general urine analysis, electrocardiography to determine indications and contraindications for physiotherapy), radiation diagnostic methods (radiography to confirm the diagnosis, computed tomography, magnetic resonance imaging), Doppler ultrasonography to assess the indicators of linear velocity of the main vessels of the neck, examination of the functional state using the SAN Scale, and assessment of pain syndrome according to the VAS scale were used.

The rehabilitation complex consisted of: physiotherapy, therapeutic physical education, massage, and drug therapy according to indications.

Drug therapy for both groups consisted of muscle relaxants, nonsteroidal anti-inflammatory drugs, antiplatelet agents, anticoagulants, and nootropic agents.

Among the physiotherapeutic procedures in the main group of patients, only SWT was performed. In the comparison group, in addition to drug therapy, magnetotherapy, phonophoresis with dexketoprofen gel, or electrophoresis with novocaine were administered.

A tip with a diameter of 15 mm was used for the SWT procedure. The number of sessions for the course of treatment was 4-8 sessions, the interval between them was 1 day. Frequency - 13-15 Hz, load level - 100-120 mJ, 1000-1500 strokes in each direction, with weak pressure, a total of no more than 3000 strokes to all points in one session.

Research results.

The dynamics of subjective assessment of the functional state based on the results of the SAN Scale test at different periods of observation showed a significant change in self-perception parameters against the background of all treatment programs (Table 2).

Table 2.

Dynamics of functional state in the near and long term according to the results of the SAN Scale test (points, $M \pm m$)

Groups	Before treatment	After 2 weeks	After 6 weeks
Self-Feeling			
Main group	$3,32 \pm 0,18$	$4,68 \pm 0,17^{**}$	$5,96 \pm 0,21^{**}$
Comparison group	$3,38 \pm 0,21$	$4,22 \pm 0,20^{*}$	$5,02 \pm 0,25^{*}$
Activity			
Main group	$4,06 \pm 0,17$	$5,78 \pm 0,10^{*}$	$6,15 \pm 0,07^{**}$
Comparison group	$4,02 \pm 0,19$	$5,48 \pm 0,08^{*}$	$5,94 \pm 0,13^{*}$
Mood			
Main group	$3,91 \pm 0,23$	$5,81 \pm 0,06^{*}$	$6,35 \pm 0,05^{**}$
Comparison group	$3,84 \pm 0,26$	$5,66 \pm 0,09^{*}$	$6,10 \pm 0,07^{*}$

Note: ** $P < 0,01$, * $P < 0,05$

However, at the end of the course, self-perception scale values in the main group of patients who received SWT treatment in the rehabilitation program were significantly higher than in the comparison group ($p < 0.01$).

The VAS scale pain severity assessment scores were 7.58 ± 0.24 points before treatment and 4.68 ± 0.16 points after the 4th–6th treatments ($p < 0.01$). In 22 (61%) patients, pain decreased after the first treatment, in 8 (22%) patients after the second treatment, and in 6 (17%) patients, pain intensified after the first treatment and decreased after the second and third treatments.

Table 3.

Dynamic of the pain syndrome manifestation according to the VAS (scores, $M \pm m$).

Groups	Before treatment	After 2 weeks	After 6 weeks
Main group	$7,58 \pm 0,24$	$4,68 \pm 0,16^{**}$	$2,06 \pm 0,12^{**}$
Comparison group	$7,52 \pm 0,23$	$5,31 \pm 0,17^{*}$	$3,68 \pm 0,18^{*}$

Note: $** P < 0,01$, $* P < 0,05$

Conclusion. During the observation period, incorporating SWT into the comprehensive rehabilitation program was found to significantly increase the effectiveness of the ongoing therapy and lead to faster recovery.

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