

Evaluation of Shock Wave Therapy Effectiveness in Patients with Cervical Radiculopathy

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Abstract:

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

Cervical radiculopathy is a disabling condition that has a significant negative impact on physical functioning, mental health and social activity of patients[4]. Neck pain is more frequently reported in women compared to men, while the prevalence follows similar trajectories in both sexes, peaking around the age of 50 years (50-54 years in women and 45-49 years in men) and decreasing thereafter [5].

Today, new high-tech methods of physiotherapy are actively used to treat cervical radiculopathy and one of such methods is shock wave therapy(SWT).

Shock wave is an acoustic wave with the kinetic energy of a bullet created by compressed air. The shock waves used are an extremely short, powerful pressure pulse with high pressure amplitudes and a small stretch component. They are generated outside the patient's body and are transmitted deep into the body, producing a therapeutic effect. This in turn promotes increased blood flow, analgesic effects, accelerated healing, restored mobility, and increased collagen production. These abilities of shock wave can be applied in degenerative diseases of spine in particular cervical spine [6].

Purpose of the study: To investigate the effect of shock wave on the cervical spine and to evaluate the effectiveness of shock wave therapy in dynamics in cervical radiculopathy.

Materials and Methods: We examined 61 patients with cervical radiculopathy on the basis of Bukhara branch of the Republican Center for Emergency Medical Care in the department of neurology. In the main group 36 patients with osteochondrosis of the spine of cervical localization were treated with standard therapy and shock-wave therapy procedures. In the comparison group, 25 patients were treated with magnetotherapy, ultraphonophoresis and massage of the cervical spine in addition to standard therapy.

Table 1. Distribution of patients by age and gender (n-61)

Gender\Age	21-39 years old	40-59 years old	>65 years old	Total (%)
Men	7 (11,5%)	9 (14,8%)	8 (13,1%)	24 (39,4%)
Women	18 (29,5%)	11 (18,0%)	9 (14,8%)	37 (60,6%)
Total (%):	25 (41,0%)	20 (32,8%)	17 (27,9%)	61 (100%)

General clinical examinations (complaints, anamnesis, objective examination, general blood analysis, general urine analysis, electrocardiography to determine indications and contraindications to the prescription of physiotherapy), methods of radial diagnostics (X-ray, computed tomography, magnetic resonance tomography to confirm the diagnosis), Doppler imaging to assess the linear velocity of the main vessels of the cervical region, functional status testing with the help of FAM test (Feelings, Activity, Mood) were carried out.

Rehabilitation complex consisted of: physiotherapy, therapeutic exercise, massage and drug therapy according to the indications.

Drug therapy for both groups consisted of myorelaxants, NSAIDs, antiaggregants, anticoagulants, nootropic agents.

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

A 15 mm diameter handpiece was used for the SWT procedure. The number of sessions for the course of treatment was 4-6 procedures with a break between them of 1 day. Frequency - 13 Hz, level of loads - 80-120 mj, 1000-1500 strokes on each side, with weak pressure, total for one session maximum 3000 strokes on all points.

Results of the study.

The dynamics of subjective assessment of the functional state based on the results of the FAM (Feelings, Activity, Mood) test in different periods of observation showed that the parameters of well-being significantly changed against the background of all treatment programs (Table 2).

Table 2. Dynamics of functional state on the basis of FAM test results in the nearest and distant periods (points, M±m)

Patient groups	Before treatment	After 2 weeks	After 6 weeks
Feelings			
Main Group	3,28±0,17	4,61±0,19**	5,90±0,2**
Comparison group	3,41±0,2	4,18±0,22*	4,97±0,26*
Activity			
Main Group	4,03±0,18	5,74±0,09*	6,11±0,06**
Comparison group	4,00±0,20	5,51±0,06*	5,98±0,12*
Mood			

MainGroup	3,88±0,24	5,77±0,05*	6,31±0,04**
Comparisongroup	3,86±0,27	5,69±0,08*	6,14±0,06*

Note: ** P<0.01, * P<0.05

However, in the patients of the main group who received SWT procedures in the rehabilitation program the values of the well-being scale at the end of the course were significantly higher ($p<0,01$) than in the comparison group.

The results according to the questionnaires of pain syndrome severity assessment on VAS scale before the procedure amounted to $7,63\pm0,26$ points, after 4-6 procedures $4,75\pm0,15$ points ($P<0,01$). Pain reduction in 22 (61%) patients occurred after the 1st procedure, in 8 (22%) patients after the 2nd procedure, in 6 (17%) patients pain increased after the first procedure and decreased after the 2nd and 3rd procedures.

Table 3. Dynamics of pain syndrome severity according to VAS (points, $M\pm m$).

Patient groups	Before treatment	After 2 weeks	After 6 weeks
MainGroup	7,63±0,26	4,75±0,15**	2,14±0,11**
Comparisongroup	7,49±0,22	5,27±0,18*	3,75±0,16*

Note: ** P<0.01, * P<0.05

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Conclusion. In the process of observation it was found that the inclusion of SWT in the complex rehabilitation program significantly increases the effectiveness of the conducted therapy and leads to rapid recovery.

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