



REVIEWED SCIENTIFIC JOURNAL
MEDICAL SOCIETY OF NATURAL MEDICINE



Medical Society
of Natural Medicine

ACUPUNCTURE AND NATURAL MEDICINE

number 1 & 2, volume 2017

ISSN 1339-4703



English



Fragment



Muscle pain syndrome elimination and spine correction by Corden (Cordus) device

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(English version of the previous Russian article)

Summary

The aim of this research to assess the efficiency of device-assisted osteopathic relief of paravertebral muscles, combined with correction of functional state of the nervous system by means of Corden (in some countries Cordus) device. "Corden" – the innovative mechanotherapy device, the design of which allows to plunge into the zone of paravertebral muscles and relax them. Therapeutic sessions were given to 19 patients (9 male patients and 10 female patients) aged between 23 and 65, suffering from various myofascial pain syndrome variants. To eliminate muscle spasm, we resorted to device-assisted relief of spinal segments or functional spinal units (FSUs). The therapy was primarily meant to relax deep-seated muscles that were in a state of hypertonia. Mechanical actions of Corden device on FSUs, combined with relaxing actions of currents on the body, improve health, eliminated pains, and reduce nervous tension.

Keywords

Muscle pain syndrome, Corden device, muscle spasm, relaxing actions of currents

Introduction

Myofascial pain syndrome is among the prime neurological syndromes causing temporary incapacity of work in working-age population. While the underlying causes of myofascial pain syndrome (MPS) may vary, a few of them are the most common. Researchers are inclined to think that muscle injuries that lead to MPS are primarily caused by muscle overloads.

Massage is a popular and common remedy for myofascial pains caused by physical or psycho-emotional strain. Nonetheless, search for innovative efficient ways to eliminate overstrain, pain syndromes, and nervous system disorders remains a topical issue amid present-day sedentary lifestyle and elevated physical strain.

In this connection, it is the aim of this research to assess the efficiency of device-assisted relief of paravertebral muscles, combined with correction of functional state of the nervous system by means of Corden device.

Method

Spinal and paravertebral muscle correction Corden unit has been used as a means of device-assisted spinal therapy. "Corden" – the innovative mechanotherapy device, the design of which allows

to plunge into the zone of paravertebral muscles and relax them. In Corden modulated action currents, which allow for changing the functional state of the nervous system in the direction of relaxation, that have anti-stress effect (Fig. 1, Fig. 2). The procedure of correcting the spine and tonus of the invertebral muscles consisted in placing the patient in the prone position with the Corden device under the desired segment in the cervical, thoracic and lumbar spine, i. e. the apparatus was placed along the central energy channel of the body (sushumna). After a 30-minute correction, the patient performed several traction and mobilization exercises to mobilize the vertebrae and strengthen the muscular corset of the back.

Therapeutic sessions were given at the Physical Therapy Department of the Clinical Hospital of the



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Russian Academy of Science, a federal state-run budgetary healthcare institution of Saint Petersburg to 19 patients (9 male patients and 10 female patients) aged between 23 and 65, suffering from various myofascial pain syndrome variants. Prior to the test, physical therapists were instructed on the properties, the operation, and the proper usage of the unit. The session included 12 procedures per patient, and consisted of Corden spinal relief and a set of exercises to mobilize spinal motion segments.

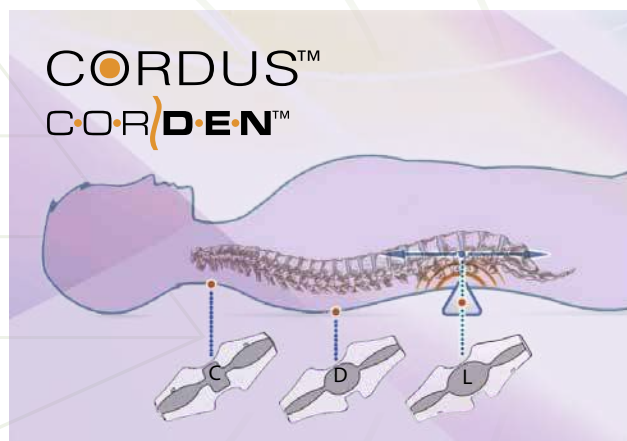
Patients selected for the session were interviewed and their informed consents were obtained. Quantitative assessment of pain was performed using a visual analog scale (VAS).^[1] By the method of VAS on a straight line 10 cm long, the patient marks the intensity of pain. The beginning of the line on the left corresponds to the absence of pain (0), the end of the segment on the right is intolerable pain (10). The patient should indicate the intensity of the pain, knowing that zero corresponds to the absence of pain, and the final digit of the scale is the maximum pain that the patient has ever experienced.

Psycho-functional status of the patients was assessed by Eysenck neuroticism test (emotional instability) and Nemchin's neuro-psycho tension (NPT) questionnaire. Eysenck's test by definition of neuroticism contains 57 questions, responding to which the level of stress resistance is determined. Questionnaire of T. A. Nemchin is a list of signs of neuropsychic tension, compiled from the data of clinical and psychological observation, and contains 30 basic characteristics of this condition, divided into three degrees of severity. The minimum number of points a test subject can gain is 30, and the maximum is 90. Typically, in persons with severe pain syndromes, the NPT level is more than 45 points. A decrease of this indicator will indicate an improvement in the patient's condition after the course of therapy.

Fig. 1. The Corden (Cordus) device



Fig. 2. The mechanism of action of the device Corden (Cordus)



Research findings

The patients were given a therapeutic session to correct the posture and functional status of the nervous system (NS) and to eliminate pain syndrome. Psychological tests done after the session suggested that the patients given a Corden unit session provided significantly lower neuroticism values, compared to the reference values they had had before the osteopathic spinal relief session (see Tab. 1). That could indicate that the patients in question had developed higher emotional stability, which contributed to maintaining organized behaviour, plus good adaptive situational purposefulness in both normal and stressful situations, following elimination of pain syndrome and onset of the state of relaxation.^[17] Higher neuroticism values that the patients had had before the correction session indicated that they had been maladaptive and less



resistant to stressful situations. According to N.D. Nenenko individuals with low neuroticism had stomachs more resistant to stresses in terms of both secretory and immune functions than individuals with high neuroticism did.

The patients also had significantly lower NPT values after a Corden session to correct the posture and functional status of the nervous system (NS) (see Tab. 1). Moreover, the questionnaire suggested that the patients that had been given a session had very few or no complaints about any physical or

psychological discomfort, with the overwhelming majority of the patients selecting questionnaire points that were indicative of an absence of previous discomforts of somatic or psychical nature.

When some spasmodic muscles relaxed, of the patients recalled various emotional experiences that were "frozen" in these tensed muscles. After such catharsis, the patients became psychologically significantly better, and the muscles of this segment relaxed.

Tab. 1. Test results for the patients with spinal pain syndrome, aged between 23 and 65, before and after a Corden unit session

	Name	NPT, points	Neuroticism	NPT, points	Neuroticism	Estimation of pain before the correction course	Estimation pain after the correction course
1	Sh-va	50	16	49	12	8	5
2	T-ak	49	14	41	8	7	4
3	M-va	47	15	42	9	8	4
4	V-na	50	14	44	11	7	5
5	K-ev	54	19	42	11	7	4
6	K-iy	47	15	45	9	9	5
7	K-ov	47	14	41	8	8	3
8	K-in	49	11	41	8	7	4
9	N-in	51	15	45	11	7	3
10	N-ko	53	13	46	9	6	2
11	M-na	48	12	44	8	7	2
12	Kh-va	46	13	41	10	6	5
13	M-ev	47	16	43	12	8	4
14	S-ko	51	15	40	9	7	3
15	R-ev	48	13	44	11	6	3
16	T-ov	46	12	43	9	7	4
17	Sh-va	49	14	44	10	5	2
18	Sh-na	45	11	41	8	6	2
19	Ya-in	47	13	43	9	6	1
	M ± m	48.7 ± 2.8	14.5 ± 2.9	*42.6 ± 2.9	*9.6 ± 3.7	6.9 ± 1.8	3.2* ± 1.4

Note: * denotes significant differences from the reference values; NPT – neuro-psychic tension.

Almost all of the patients had normalized sleep, increased workability, and significant reductions in painful sensations (see Tab. 2). Quantification of pain showed a significant decrease in the severity of pain or even its disappearance after spending correction course (Tab. 1). So patients before the corrective course had a high average severity of pain syndrome of 6.9 ± 1.8 points, and after the course

of correction of the spine the pain level became significantly less than 3.2 ± 1.4 . These indicators indicate that in the majority of subjects the pain almost disappeared.

The patients experienced reduced feelings of tightness in the cervical, thoracic, and lumbar regions, and had improved mobility of arms and



legs, normalized cardiac activity, genitourinary system function, and a healthy appetite. Moreover, they had no more headaches, pins and needles in the liver area; and reduced tension in the back

and epigastria contributed to improved postures. The majority of subjects felt “energy flows” (in the form of heat, tingling and pulsation), walking along the spine to the feet.

Tab. 2. Clinical effect of the spinal correction by device Corden on pain syndrome sufferers aged between 23 and 65

Patient No	Sex and age	Diagnosis	Clinical effect
1.	F, 56	Lower back pains	Pain syndrome relief
2	M, 48	Shoulder epicondylitis	Pain syndrome relief
3	F, 45	Scapulohumeral peri-arthritis	Pain syndrome relief and improved joint mobility
4	M, 62	Scapulohumeral peri-arthritis	Improved joint mobility
5	M, 43	Neck pains	Pain syndrome relief
6	F, 37	Lower back pains	Pain syndrome relief
7	F, 49	Tension headaches	Pain syndrome and epigastric tension relief
8	F, 32	Degenerative disc disease accompanied with lower back radicular pains	No pronounced effect
9	F, 28	Kyphoscoliosis and thoracic pains	Pain syndrome relief, reduced pins and needles in the liver
10	F, 39	Scoliosis and thoracic pains	Pain syndrome relief
11	F, 40	Lower back pains	Pain syndrome relief
12	M, 54	Thoracic pains	No pronounced effect
13	F, 45	Degenerative disc disease accompanied with lower back radicular pains	Pain syndrome relief
14	M, 47	Degenerative disc disease accompanied with lower back radicular pains	Pain syndrome relief
15	F, 66	Stroke rehabilitation; right arm paresis	Improved mobility of arm
16	M, 65	Neck pains and backaches caused by occupational muscle tension	Weakly positive effect
18	F, 33	Asthenic syndrome	Improved overall health
19	M, 30	Asthenic syndrome	Improved health

Discussion

It is our theory that backaches that the patients in question had were caused by pain impulses coming from both injured spinal tissues and close structures to the spine: joints, articulations, body organs, skin, ligaments, and muscles – both paravertebral and extra-vertebral. Ligaments, muscles, periosteal over processes, disc protrusions, and intervertebral discs could be sources of pain in the vertebral motion segment. All nociceptive impulses were sent to the CNS, regardless of their sources. At the same time, pain impulses activated alpha- and beta-motor neurons in the anterior horns of the spinal cord. Activation of anterior motor neurons caused hypertonia of muscles innervated from the spinal cord segment in question.

MPS is commonly believed to be triggered by constant or repeated low-level muscle contractions,^[7] maximal and submaximal concentric muscle contractions, and long tensions in individual muscle groups- overstrain body posture in hypodynamia.^[4]^[18]

Some researchers^{[5][13][14][15]} make a point that stimulation of nociceptors of the very muscle occurs when muscular spasm takes place. Hyperaemia develops in spasm-ridden muscles, which increases activation of nociceptors in the muscle tissue. A spasm-ridden muscle becomes a source of extra nociceptive impulses that are sent to cells of the posterior horns of the same spinal cord segment. Accordingly, an increased pain impulse flow



increases the activity of anterior motor neurons, which, in turn, increases muscle spasm, forming a vicious circle of **pain – muscle spasm – increased pain – increased muscle spasm**.

Physical body state in individuals that either prone to overstrain or lead a sedentary may be improved though both manual and device assisted methods.^[2]
[8][9][12]

To eliminate muscle spasm, we resorted to device-assisted relief of spinal segments or functional spinal units (FSUs). The therapy was primarily meant to relax deep-seated muscles that were in a state of hypertonia. Relaxation was manifested by improved mobility of the FSUs. It was one of the top-priority tasks of supportive locomotive apparatus rehabilitation sessions to restore mobility of FSUs.

The relief and the treatment of the spine took place when conic protrusions of the unit pressed on a muscle group of a FSU, located between transversal processes of vertebrae, under a patient's body weight, relaxing those muscles to an extent when a local traction between the vertebrae was possible. That, in turn, caused extension of the ligamentous apparatus of a FSU,^[6] while slow-frequency modulation currents generated by the unit contributed to onset of relaxation.

When the patient's body weight pressed on the unit, the patient was able to feel the pain, to concentrate on it and to feel it clear away due to acupressure. We applied a relaxation technique that worked to eliminate pain of the body and the mind, to restore mobility of FSUs, and to reduce anxiety and discomfort.

The research findings (see Tab. 2) suggest that device-assisted therapy of FSUs not only eliminated backaches, but also restored mobility of the major and the most vulnerable joints, including the shoulder joints and the pelvic joints.

The research indicates that Corden unit paravertebral muscle correction has proved effective on most patients, provided that the unit is applied by properly trained staff and in the absence of contraindications in the patients. At the same time, patients feel a change in their psycho-energy

state, manifested in activation of the body's energy, forming a sense of calm and deep relaxation. In this connection, the device can be used for acupuncture in the channels along the spine.

Conclusions

1. The device acts on both spinal segments and spinal joints to alleviate back extensors and eliminate blocks in spinal FSUs, which reduces or even eliminates pains.
2. Corden device acts deeply on the paravertebral areas that overlap meridian channels and reflex areas through which body organs are regulated. Mechanical actions of Corden device on FSUs, combined with relaxing actions of currents on the body, improve health, eliminated pains, and reduce nervous tension.
3. The designed method to relieve paravertebral muscles eliminates vertebrogenic and myofascial pain syndrome, and contributes to prevention of movement disorders and vegetative symptoms that may appear in further physical exercises to build up pectoral girdle.

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