ISSN 2228-9860 eISSN 1906-9642 CODEN: ITJEA8

International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies

http://TuEngr.com

Experience of Using Tekar Therapy in Patients with Diseases of the Musculoskeletal System and Nervous System

Leila Rasimovna Kaziahmedova[1], Mansur Saidabdulovich Mazaev[1], Snezhana Olegovna Bicheeva[1], Kazbek Nurudinovich Kodzoev[2], Maryam Muslimovna Kolgaeva[3], Diana Adamovna Dzhandar[1], Malvina Levanovna Bibilova[3], Nazly Ramizovna Suyunova[1], Aliyat Said-Magomedovna Dzhabrailova[3], Aishat Akhmadovna Daudova[3]

[1] *Rostov State Medical University, Rostov-on-Don, RUSSIA.*
[2] *Moscow State Medical and Dental University named after A. I. Evdokimov, Moscow, RUSSIA.*
[3] *North Ossetian State Medical Academy, Vladikavkaz, Republic of North Ossetia-Alania, RUSSIA.*
**Corresponding Author (Tel: +79183500889, Email: ruslankalmykov777 @yandex.ru).*

Paper ID: 13A11S

Volume 13 Issue 11

Received 13 March 2022
Received in revised form 13 July 2022
Accepted 20 July 2022
Available online 27 July 2022

Keywords:
Tekar therapy;
Musculoskeletal system;
Nervous system;
Osteoporosis;
osteoarthritis

Abstract

The method of Tecar therapy is used in the treatment of joint diseases, in particular, osteoarthritis. Osteoarthritis is the most common form of joint damage and one of the leading causes of disability in the world. According to statistics, in the age group from 25 to 74 years, about 30% of the population have joint pathology confirmed by radiation diagnostic methods. The main symptom of osteoarthritis, which forces the patient to seek specialized help, is pain. The frequently detected discrepancy between the severity of clinical and radiological manifestations of the disease is explained by the peculiarities of the formation and irradiation of pain in pathology. The study included 80 patients with radiologically confirmed diagnoses: 35 patients suffering from coxarthrosis (stages 2-3) and 45 patients suffering from gonarthrosis (stages 2-3). Of these, 38% are men. Pain intensity was assessed by a 10-point visual-analog pain scale (VAPS). Reduction of pain level by 5-6 points was assessed as significant for joints. It is also advisable to prescribe Tekar therapy for neuropathies of various etiologies since clinical experience shows a significant and rapid reduction of pain and inflammation after its implementation, which reduces the recovery time of such patients and improves their quality of life.

Discipline: Medicine, orthopedics, therapy

Cite This Article:

Kaziahmedova, L.R., Mazaev, M.S., Bicheeva, S.O., Kodzoev, K.N., Kolgaeva, M.M., Dzhandar, D.A., …, Daudova, A.A. (2022) Experience of Using Tekar Therapy in Patients with Diseases of the Musculoskeletal System and Nervous System. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies, 13*(11), 13A11S, 1-7. http://TUENGR.COM/V13/13A11S.pdf DOI: 10.14456/ITJEMAST.2022.229

1 Introduction

The method of Tecar therapy is used in the treatment of joint diseases, in particular, osteoarthritis. Osteoarthritis is the most common form of joint damage and one of the leading causes of disability in the world. According to statistical data, in the age group from 25 to 74 years, about 30% of the population have joint pathology confirmed by radiation diagnostic methods [1,2]. The main symptom of osteoarthritis, which forces the patient to seek specialized help, is pain. The frequently detected discrepancy between the severity of clinical and radiological manifestations of the disease is explained by the peculiarities of the formation and irradiation of pain in joint pathology [3,4]. Involvement in the pathological process of not only intra-articular and periarticular tissues but also the musculoskeletal and tendon-ligamentous apparatus of the entire limb causes the multifactorial formation of pain syndrome and the need for an integrated approach to treatment [5]. The main goal of arthrosis therapy is the relief of myofascial and musculotonic syndromes, slowing down degenerative-dystrophic processes through stimulation in subchondral tissues, intra- and periarticular structures, which will improve the quality of life of patients.

The purpose of the study: is to evaluate the effectiveness of the effect of endogenous heat with the help of a Tecar therapy device for acute and chronic pain in large joints, with pain syndrome caused by diseases of the peripheral nervous system in outpatient settings.

2 Literature Review

The procedure of Tecar therapy consists in exposing the body to a high-frequency alternating current, which penetrates into the tissues in the form of electromagnetic waves, leading to the appearance of endogenous heat [6,7]. The procedure affects the tissues from the inside, penetrates into the deep layers and is aimed at the natural regeneration of the body's cells. Analgesic, anti-inflammatory, antispasmodic action (removal of spasm of smooth and striated muscles), decongestant, increased blood pressure- and lymph circulation, increased permeability of the vascular wall, activation of metabolic processes, increased supply of oxygen and nutrients to tissues, stimulation of collagen production in connective tissue, which leads to activation of natural regeneration processes, shortens the recovery time of muscles, tendons, ligaments and fascia after injuries and surgical interventions (in case of traumatic muscle rupture, fiber recovery occurs without forming scar tissue), improves the elasticity of tissues and ligaments [8-12]. The transmission of electromagnetic radiation energy to the tissue is carried out using two electrodes (capacitive and resistive). A special wired gel is used, which conducts electric current and heat well [13]. The area of impact, the duration of the procedure, and the multiplicity are determined individually and depend on the stage of the disease, the severity of the pain syndrome, the general condition of the patient, and concomitant pathology. On average, 5-6 procedures are prescribed, 1 time a day. The procedure takes an average of 20 minutes [14,15].

The physiological effects of increased energy during Tecar therapy are a decrease in muscle spasms and contractures as a result of activity, vasodilation with an increase in local blood flow,

contributing to oxygen supply and acceleration of hemorrhagic reabsorption, activation of major metabolic reactions, an increase in capacity [16].

It should be noted that this new technology is a useful tool in the treatment of various pathologies, compared with other methods of treatment in terms of the presence and/or absence of certain positive effects, but also has excellent characteristics that are effective even when other methods of treatment fail. There is a guarantee that therapy provides a balance between the therapist's manual abilities and the special energy that this technology provides, thereby providing therapists and patients with increasingly satisfactory results [17,18].

3 Material and Methods

The experiment was conducted in the Stavropol Regional Consulting Clinical Diagnostic Center (Stavropol, Russia) in 2020-2021. The study included 80 patients with radiologically confirmed diagnoses: 35 patients suffering from coxarthrosis (stages 2-3) and 45 patients suffering from gonarthrosis (stages 2-3). Of these, 38% are men. Pain intensity was assessed by a 10-point visual-analog pain scale (VAPS). The reduction of pain level by 5-6 points was assessed as significant. Patients were randomized into 2 groups: group 1 (main) (40 patients): patients who received only basic medication. Group 2 (comparison, 40 patients): patients who, against the background of basic drug therapy, underwent Tecar therapy with a Globus device (Figure 1) using energy transmission by capacitive and resistive methods, with a frequency of the radio frequency range from 1.2MHz to 4 MHz, power from 100-350 watts.

Figure 1: Device for Tecar therapy (Globus LLC, Russia)

4 Results and Discussion

The treatment was carried out in a course of 3 to 6 procedures (3 sessions per week), and the duration of the session was 20 minutes. The evaluation of results was evaluated using a 10-point VAPS scale and a questionnaire. The initial intensity of pain in patients was assessed on the VAPS scale - 8-9 points (Table 1).

Table 1: Evaluation of the results was evaluated using a 10-point VAPS scale

Relief of pain on the VAPS scale	1 group of patients, %	2 group of patients, %
Full cupping for 8-9 points	12	30
Significant reduction of pain by 5-6 points	54	58
Pain reduction by 2-3 points	34	12

In group 1: complete relief of pain was noted in 12% of patients, with a significant decrease in pain by 5-6 points – in 54 %, and a decrease in pain by 2-3 points – in 34%. In group 2: complete pain relief in 30% of patients, significant pain reduction (by 5-6 points)- in 58%, and pain reduction by 2-3 points - in 12% of patients. In group 1, a decrease in pain and an increase in the volume of movement in the joint occurred on average - after 10 days (by the end of the course of drug therapy). In the 2nd group, pain reduction and an increase in the volume of movement in the joint occurred after the 3rd procedure of Tecar therapy (on the 5th day of treatment, with a multiplicity of procedures every other day).

Tekar therapy was also performed in patients with pain syndrome caused by diseases of the peripheral nervous system. 58 patients with tunnel neuropathies of the upper and lower extremities, algic forms of polyneuropathy, and neuropathy of the occipital nerves were treated. The patients were divided into 2 groups: group 1 (main) (29 people): patients who received only basic drug therapy: B vitamins, thioctic acid, ipidacrine, blockades with diprospan. Group 2 (comparison) (29 people): patients who received basic drug therapy, and instead of blockade with diprospan, Tecar therapy procedures were performed. The effect of Tecar therapy tt was marked in all cases by a decrease in pain intensity from 7-8 points to 1-0 points on the VAPS scale. In one case, a patient stopped treatment due to a conversion reaction. In other cases, Thekar therapy was well tolerated. In 3 patients, due to intolerance to medical and drug blockades (psychogenic fainting occurred), interventional therapy was discontinued and only drug therapy was performed. According to our clinical observations, the effect of Tekar therapy was comparable to the effect of therapeutic and medicinal blockades, but it occurred somewhat later (on day 3 during Tekar therapy daily) The insignificant effect of Tecar therapy, as well as from previous pharmacotherapy, was observed only in one patient with posttraumatic (postinjection) sciatic nerve neuropathy.

Tecar therapy was also performed for gluteal tendopathy, hamstring syndrome, trochanteritis in 9 patients. Tekar therapy was carried out in the form of monotherapy, due to the low effectiveness of previous drug therapy. There was a decrease in the intensity of pain on the VAPS scale from 7 points to 1-2 points, in one case - up to 0 points. In three patients with specific back pain caused by postmenopausal osteoporosis, it was also possible to reduce the intensity of pain from 8-9 points on VAPS to 2-3 points.

5 Conclusion

The course of Tecar therapy for diseases of the musculoskeletal system in acute and chronic pain quickly relieves pain syndrome and inflammation, increases the volume of movement in the affected joint, which reduces the time of rehabilitation treatment of patients and improves their quality of life. No significant side effects or complications from the course of procedures were detected.

It is also advisable to prescribe Tecar therapy for neuropathies of various etiologies, because clinical experience shows a significant and rapid reduction of pain and inflammation after its

implementation, which reduces the recovery time of such patients and improves their quality of life. No side effects were observed during Tekar therapy.

6 Availability of Data and Material

Data can be made available by contacting the corresponding author.

7 References

[1] Samuel Ribeiro, Bebiana Henriques, Ricardo Cardoso. The Effectiveness of Tecar Therapy in Musculoskeletal Disorders. International Journal of Public Health and Health Systems. 2018; 3(5): 77-83

[2] Pisano, M., Allievi, N., Gurusamy, K. et al. 2020 World Society of Emergency Surgery updated guidelines for the diagnosis and treatment of acute calculus cholecystitis. World J Emerg Surg. 2020; 15, 61. https://doi.org/10.1186/s13017-020-00336-x

[3] Baj J, Karakuła-Juchnowicz H, Teresiński G, Buszewicz G, Ciesielka M, Sitarz R, Forma A, Karakuła K, Flieger W, Portincasa P, Maciejewski R. COVID-19: Specific and Non-Specific Clinical Manifestations and Symptoms: The Current State of Knowledge. Journal of Clinical Medicine. 2020; 9(6):1753. https://doi.org/10.3390/jcm9061753

[4] Perolat, R., Kastler, A., Nicot, B. et al. Facet joint syndrome: from diagnosis to interventional management. Insights Imaging. 2018; 9, 773–789. https://doi.org/10.1007/s13244-018-0638-x

[5] Rzhepakovsky I, Anusha Siddiqui S, Avanesyan S, Benlidayi M, Dhingra K, Dolgalev A, Enukashvily N, Fritsch T, Heinz V, Kochergin S, Nagdalian A, Sizonenko M, Timchenko L, Vukovic M, Piskov S, Grimm WD. Anti-arthritic effect of chicken embryo tissue hydrolyzate against adjuvant arthritis in rats (X-ray microtomographic and histopathological analysis). Food Sci Nutr. 2021 Aug 18;9(10):5648-5669. DOI: 10.1002/fsn3.2529

[6] Uchida M, Tabusa F, Komatsu M, et al. Studies on 2(1H)-quinolinone derivatives as gastric antiulcer active agents. Synthesis and antiulcer activity of the metabolites of 2-(4-chlorobenzoylamino)-3-[2(1H)quinolinon-4-yl] propionic acid. Chem Pharm Bull. 1986;34(9):4821-4. DOI: 10.1248/cpb.34.4821

[7] Clijsen R, Leoni D, Schneebeli A, Cescon C, Soldini E, Li L, Barbero M. Does the Application of Tecar Therapy Affect Temperature and Perfusion of Skin and Muscle Microcirculation? A Pilot Feasibility Study on Healthy Subjects. J Altern Complement Med. 2020 Feb;26(2):147-153. DOI: 10.1089/acm.2019.0165

[8] Yeste-Fabregat M, Baraja-Vegas L, Vicente-Mampel J, Pérez-Bermejo M, Bautista González IJ, Barrios C. Acute Effects of Tecar Therapy on Skin Temperature, Ankle Mobility and Hyperalgesia in Myofascial Pain Syndrome in Professional Basketball Players: A Pilot Study. Int J Environ Res Public Health. 2021 Aug 19;18(16):8756. DOI: 10.3390/ijerph18168756

[9] Notarnicola A, Maccagnano G, Gallone MF, Covelli I, Tafuri S, Moretti B. Short term efficacy of capacitive-resistive diathermy therapy in patients with low back pain: a prospective randomized controlled trial. J Biol Regul Homeost Agents. 2017 Apr-Jun;31(2):509-515

[10] Blinov AV, Nagdalian AA, Povetkin SN, Gvozdenko AA, Verevkina MN, Rzhepakovsky IV, Lopteva MS, Maglakelidze DG, Kataeva TS, Blinova AA, Golik AB, Osipchuk GV, Shariati MA. Surface-Oxidized Polymer-Stabilized Silver Nanoparticles as a Covering Component of Suture Materials. Micromachines. 2022; 13(7):1105. DOI: 10.3390/mi13071105

[11] Cau N, Cimolin V, Aspesi V, Galli M, Postiglione F, Todisco A, Tacchini E, Darno D, Capodaglio P. Preliminary evidence of effectiveness of TECAR in lymphedema. Lymphology. 2019;52(1):35-43

[12] Ranjha MMAN, Shafique B, Rehman A, Mehmood A, Ali A, Zahra SM, Roobab U, Singh A, Ibrahim

SA and Siddiqui SA (2022) Biocompatible Nanomaterials in Food Science, Technology, and Nutrient Drug Delivery: Recent Developments and Applications. Front. Nutr. 8:778155. DOI: 10.3389/fnut.2021.778155

[13] Barassi G, Mariani C, Supplizi M, Prosperi L, Di Simone E, Marinucci C, Pellegrino R, Guglielmi V, Younes A, Di Iorio A. Capacitive and Resistive Electric Transfer Therapy: A Comparison of Operating Methods in Non-specific Chronic Low Back Pain. Adv Exp Med Biol. 2022;1375:39-46. DOI: 10.1007/5584_2021_692

[14] Valentini S, Bruno E, Nanni C, Musella V, Antonucci M, Spinella G. Superficial Heating Evaluation by Thermographic Imaging before and after Tecar Therapy in Six Dogs Submitted to a Rehabilitation Protocol: A Pilot Study. Animals (Basel). 2021 Jan 20;11(2):249. DOI: 10.3390/ani11020249

[15] Duñabeitia I, Arrieta H, Torres-Unda J, Gil J, Santos-Concejero J, Gil SM, Irazusta J, Bidaurrazaga-Letona I. Effects of a capacitive-resistive electric transfer therapy on physiological and biomechanical parameters in recreational runners: A randomized controlled crossover trial. Phys Ther Sport. 2018 Jul;32:227-234. DOI: 10.1016/j.ptsp.2018.05.020

[16] Boissevain I. Tecar [Tecar therapy]. Tijdschr Diergeneeskd. 2014 Apr 1;139(4):15. Dutch

[17] Osti R, Pari C, Salvatori G, Massari L. Tri-length laser therapy associated to tecar therapy in the treatment of low-back pain in adults: a preliminary report of a prospective case series. Lasers Med Sci. 2015 Jan;30(1):407-12. DOI: 10.1007/s10103-014-1684-3

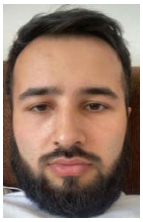
[18] Orsaeva AT, Tamrieva LA, Mischvelov AE, Osadchiy SS, Osipchuk GV, Povetkin SN, Simonov AN. Digital clinic “Smart ward”. Pharmacophore. 2020;11(1):142-146

[19] Rodríguez-Sanz J, López-de-Celis C, Hidalgo-García C, González-Rueda V, Ragazzi P, Bueno-Gracia E, Llurda-Almuzara L, Pérez-Bellmunt A. Is Tecar Therapy Effective on Biceps Femoris and Quadriceps Rehabilitation? A Cadaveric Study. J Sport Rehabil. 2022 Apr 1:1-8. DOI: 10.1123/jsr.2021-0458

Leila Rasimovna Kaziahmedova is a student of Rostov State Medical University, Rostov-on-Don, Russia

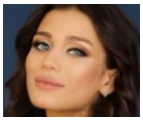
Mansur Saidabdulovich Mazaev is a student of Rostov State Medical University, Rostov-on-Don, Russia

Snezhana Olegovna Bicheeva is a student of Rostov State Medical University, Rostov-on-Don, Russia



Kazbek Nurudinovich Kodzoev is a student of Moscow State University of Medicine and Dentistry Named After A. I. Evdokimov, Moscow, Russia.

Maryam Muslimovna Kolgaeva is a student of North Ossetian State Medical Academy, Vladikavkaz, Republic of North Ossetia-Alania, Russia



Diana Adamovna Dzhandar is a student of Rostov State Medical University, Rostov-on-Don, Russia

Malvina Levanovna Bibilova is a student of North Ossetian State Medical Academy, Vladikavkaz, Republic of North Ossetia-Alania, Russia

Nazly Ramizovna Suyunova is a student of Rostov State Medical University, Rostov-on-Don, Russia

Aliyat Said-Magomedovna Dzhabrailova is a student of North Ossetian State Medical Academy, Vladikavkaz, Republic of North Ossetia-Alania, Russia

Aishat Akhmadovna Daudova is a student of North Ossetian State Medical Academy, Vladikavkaz, Republic of North Ossetia-Alania, Russia