Review Article

A New Diagnostic and Therapeutic Tool for the Treatment of Lower Back Pain

Abstract

The purpose of this study was to show that patients with low back pain who were not responding to traditional therapy could benefit from physiotherapy when using the diagnostic and therapeutic medical information system Computer Kinesiology. The main purposes of computer kinesiology are to diagnose and treat functional abnormalities of the locomotors system. In this pilot trial, there were 55 participants with acute and chronic back pain (Group 1) and 51 participants without back pain (Group 2). The third group consisted of 67 healthy volunteers who showed no signs of musculoskeletal disorders or back pain. The diagnostic component of the Computer Kinesiology approach assessed each of the 173 participants three times. Groups 1 and 2 received treatment following each diagnosis.

The H score was used to assess the effect. The H score has to be decreased by at least one point in order to be considered improved after therapy. In 87.3% (95% CI: 75.5-94.7) of Group 1 participants and in 78.4% (95% CI: 64.7-88.7) of Group 2 participants did the H score decline by at least one point. The distribution of H Score grades in Group 3 remained unchanged. The improvement was unaffected by the length of the therapy and was unrelated to gender, age, or BMI. This study showed that using the Computer Kinesiology system for primary and secondary prevention of back pain had a high therapeutic efficacy in patients with back pain (Group 1) and in people without back pain (Group 2).

Keywords: Low back pain • Clinical practice • Non-surgical treatments • Systematic review • Therapeutic • Diagnosis

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Introduction

Back pain is currently an epidemic on a global scale. Up to 100 million persons in the United States experience chronic back pain, and their care, which includes lost productivity and disability, costs 635 billion dollars annually. Back pain has historically been classified as acute, sub-acute, and chronic. Despite this, epidemiological studies indicate that back pain typically has an episodic, recurrent, and intermittent nature. The following are the challenges' occurrence and prevalence: 40 percent of people experience back pain once a year and 50 to 80 percent of adults have experienced back pain at some point in their lives. One of the most common excuses for being unable to work is back discomfort. Currently, back discomfort develops at age 11 in 12% of adolescents. The number grows by up to 50% by the age of 15 [1].

In medicine, back pain is referred to by a variety of names or diseases, including degenerative alterations of the spine, lumbago, sciatica, and vertebrogenic algid syndrome. Motor, sensitive, and vegetative symptoms are all possible with this illness. For every ailment, the disease stage is important. Sub-acute pain lasts for 4–12 weeks, chronic pain lasts for more than 12 weeks, and acute pain lasts up to 4 weeks. According to the NIH Task Force on Chronic Back Pain Standard 2015's most recent guideline, despite 40 years of research into the aetiology of LBP (low back pain), making a diagnosis based on pathophysiological or anatomical criteria is not helpful [2].

Currently, Medical Expert Information System Computer Kinesiology (MEIS CK) appears to be a novel and useful therapeutic tool for the management of low back pain (described in

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our study) that is not responding to traditional therapy (e.g., hospitalisation in departments like neurology, orthopaedics, and rehabilitation; complex pharmacotherapy treatment; infusion therapy; local injection under CT control; contraindications for operations; and patient's preference for conservative treatment). This technique is primarily used to treat functional locomotors problems. MEIS CK supports LBP NICE recommendations for an individual patient's auto therapy and exercise programmes [3].

Materials and Method

The study was authorized by the Third Faculty of Medicine's ethics committee, and all subjects provided written informed consent (number 20190001/H/1). Patients with acute or persistent back pain who actively sought employment in the field of computer kinesiology (CK) and who had previously had unsuccessful treatment from doctors and physical therapists were classified as members of Group 1. The individuals in Group 2 were those without back pain who actively sought out a CK workplace and chose MEIS CK as their primary method of musculoskeletal condition prevention. The healthy participants in Group 3-the control group-actively sought out a CK job. They were all citizens of the Czech Republic [4].

The organism reacts to both internal and exterior stimuli simultaneously. In addition to present diseases of the locomotors system, MEIS CK shows reflecting and segmental projection, linked distant reflex symptoms of visceral organ disorders, motor system response, and metabolic reaction to endocrine disorders, as well as psychological impacts.

The pictures were assessed by two skilled surgeons using Modic's criteria for the presence of sub choral signal anomalies. Both T1W and T2W scanned 12 photos from left to right using the same equipment, and two consecutive images with aberrant signal changes are regarded as having MCs [5]. With a value of 0.85, the overall inter observer agreement was quite good. There were three groups of patients. 50 patients without MCs made up Group A; there were 22 men and 28 women, with ages ranging from 25 to 62. 31 patients with Modic type I alterations from Group B, including 13 men and 18 women,

ranged in age from 21 to 65. 48 patients with Modic type II alterations made up Group C.

Discussion

Endplate alterations have been linked to LBP, and our earlier research found that four different endplate lesions-nodes, Schmorl's fracture, erosion, and calcification-were linked to both disc degeneration and LBP. It is unknown, though, if they have an impact on nonsurgical treatment [6].

McKenzie exercises (extension in lying), medication therapy, bed rest, a change in lifestyle, and TCM therapeutic massage are all components of the nonsurgical treatment that is being offered. The lumbar muscles can become stronger by McKenzie exercises, and various researchers have already evaluated the function and activation patterns of the trunk musculature in relation to the idea of spinal stability. NSAIDs work by suppressing cyclooxygenase enzymes (COX-1 and COX-2) to varying degrees. This prevents arachidonic acid from being converted to prostaglandins, which causes inflammation and sensitises peripheral nociceptors. Muscle relaxants often affect skeletal muscle indirectly by blocking central polysynaptic neural activities. Resting in bed and getting massages can lower waist load, which eases back muscles and eases pain [7].

According to several researchers, the main cause of LBP with MC patients is inflammation. Interleukin 6, interleukin 8, prostaglandin E2, and tumour necrosis factor alpha are examples of inflammatory substances that induce pain after activating nerve terminals, Suggested that a local inflammatory response might be connected to the up regulation of inflammatory mediators in the nucleus pulpous. The nucleus pulpous can produce a variety of inflammatory factors and transmit them to the vertebrae through the endplates' fissures. They also discovered that the expression of these inflammatory factors was significantly higher in endplates from patients who had Modic type I changes compared to those from patients who had Modic type II changes. NSAIDs may therefore be susceptible to LBP due to their ability to control pain brought on by inflammation. This can be explained by the observation that group B showed a significantly higher improvement rate in pain

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3 months after treatment (54,7%) compared to group C (46.0%), indicating that Modic type I modifications led to better results than Modic type II changes [8].

We were able to ameliorate the circumstances for 87% (48 of 55) of the patients in Group 1; out of these 48 patients, 17 were completely free of back pain. A highly significant finding in Group 1 appears to be the redistribution of the H score from grade 3 to grades 1 and 2; this indicates that participants' symptoms (such as back pain) or functional abnormalities of the locomotors system were resolved. 78.4% of those in Group 2 noticed improvement (i.e., 40 participants of the total number 51). Surprisingly, the H score for each of the 25 participants who had a grade of 3 improved by at least one grade [9].

Treatment of carefully chosen muscles and soft tissues in accordance with the MEIS CK algorithm aids in quick reactions and long-lasting therapeutic results without putting the patient under undue stress. The patient is taught and inspired to complete commonplace activities chosen specifically by the MEIS CK programmer thanks to the presentation of actual findings in neatly organized charts. The MEIS CK system's diagnostic component can be used to assess the efficacy of physiotherapeutic treatment methods and complies with WHO requirements for evidence by the EBM concept. The majority of physiotherapists' outpatient practices use MEIS CK. Additionally, it is utilised during hospital stays in physiotherapeutic settings and for spa treatments [10].

Conclusion

In conclusion, the presence of MCs determines how well individuals with LBP respond to nonsurgical treatment. Additionally, the crucial function of a formal nonsurgical treatment as well as the value of confidence was made clear. Additionally, type I alterations can help symptoms go better after a second round of treatment.

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