


Effectiveness and Perspectives on The Application of Traditional Korean And Western Medicine in The Treatment of Lumbosacral Dorsopathy

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Abstract: Lumbosacral dorsopathy-related pain syndrome remains a significant global health challenge, requiring continuous advancement in treatment strategies. While Western medicine provides structured and evidence-based approaches, traditional Korean medicine offers complementary techniques that may enhance therapeutic outcomes when used in conjunction. The integration of these two medical systems could lead to more comprehensive and personalized care for patients. Improving treatment effectiveness is critical, as persistent pain from lumbosacral dorsopathy significantly contributes to long-term disability. This review analyzes current diagnostic and therapeutic practices through a systematic examination of scientific literature, highlighting the potential benefits and limitations of combining Western and traditional Korean medical approaches.

Keywords: Non-specific pain; lumbosacral dorsopathy; traditional Korean medicine; quality of life.

Introduction: Currently, back pain is termed "dorsopathy" and is included in the nosological group of diseases of the osteomuscular system and connective tissue. The leading symptom-complex of dorsopathy is a non-visceral pain in the trunk and extremities. The structure of the dorsopathy classification includes deforming dorsopathy (in spinal deformities, degeneration of intervertebral disks without their protrusion, spondylolysthesia); dorsopathy due to protrusions of degenerative disks with pain syndrome; dorsalgia and sympathatia [1]. According to the World Health Organization, complaints of back pain are the second most common cause of visiting a GP. Back pain troubles people of various professions living in different continents with the similar frequency [4]. At present, about 780 million adults have LSD symptoms, and the probability of LSD among people at risk is about 40%. It should be noted that the LSD has a significant impact on work and household components of people's life as in about 70% of cases LSD is the cause of disability and significant restrictions in household activity [5]. Although episodes

of back pain associated with LSD are often short, about 25% of patients subsequently develop a clinical picture of chronic pain, which is the main cause of long-term disability. Also such LSD symptoms as lower back pain, loss of leg muscle function, impairment of various types of sensitivity in lower extremities and others can portend a significant decrease in the patients' quality of life [6].

Milestones in the diagnosis of LSD-associated pain syndrome: The contemporary clinical guidelines on diagnosis of pain syndrome in LSD are based on the diagnostic stratification, when patients with lower back pain are assigned into one of four broad categories: patients with visceral disease (e.g. nephrolithiasis), specific spinal diseases (such as axial spondylitis), radicular syndrome or non-specific lower back pain [7]. A. Downie et al. (2013) analyzed the frequency of identification of categories of pain syndrome causes and revealed that in primary health care settings, most patients were found to complain of non-specific lower back pain (about 90% of patients) [8]. When the pain has persisted for more than 3 months, many patients

meet the ICD-11 criteria of chronic primary pain. Usually <1% of patients with back pain who seek primary medical care have diseases of internal organs or the spine [9].

The stratification of pain syndrome in LSD is an essential element as it is directly associated with treatment of patients. Diagnostic examination of patients with LSD is used to identify people with suspected specific spinal or internal diseases, who need deeper diagnostic search and referral to specialists of other medical specialties. In most cases, both non-specific lower back pain and radicular syndrome do not require additional diagnostic measures other than MRI and routine clinical examination to identify the risk of pathology requiring surgery. Warning signs, or so-called "red flags", such as unexplained rapid weight loss, traditionally is used to identify patients with a higher probability of bladder or colon dysfunction, hard drug users, recent infection, oncological diseases [8]. The meta-analysis of scientific data made by N. Henschke et al. (2009) obtained the data on the most common problems of screening patients with LSD associated with these "red flags" that gives nearly 80% of false positive results. Patients who seek primary care have at least one warning symptom given that < 1.0% of patients have a specific spinal abnormality in LSD [10]. In addition to application of the "red flags" diagnostic criterion, recently other criteria, i.e. "orange, yellow, blue" and "black" flags for LSD patients have become popular, where "orange" means mental status disorder, "yellow flag" indicates cognitive, emotional and behavioral status impairment, "blue" one means labor ability disorder and "black" implies systemic impairment [11].

R.Chou et al. (2011) believe that in order to identify patients who need deeper diagnostic examination, some guidelines take into account the consequences of missed diagnosis and certainty of diagnosis. For example, the American College of Physicians' Imaging Manual recommends postponing diagnostic procedures until completion of a trial therapy for patients with low suspicion for cancer. However, it offers immediate further diagnostic examination of patients with suspected "horse tail" syndrome (in which compression of the nerve roots of the "horse tail" causes loss of motor and sensory function) and infection (e.g., epidural abscess) due to adverse consequences of late diagnosis [12]. Many patients with non-specific pain (NSP) recover after treatment; however, about 15% of patients may have chronic pain, up to disability development [13]. This largely causes and explains a high level of expenses and suffering of patients with chronic pain associated with LSD. Prevention of NSP is therefore important, and early

detection of such patients is an urgent problem that the world scientific community is trying to solve [14]. The existing tools for early screening of LSD-associated NSP among patients include the "STarTBack" musculoskeletal pain screening questionnaire [15]. In addition to the complex characterization of LSD-pain associated, STarTBack's stratification tool assesses psychological and social factors including the risk of emotional distress, signs of fear avoidance, self-evaluation of functioning and expected return to working capacity [16]. Predictive assessment of the risk of disability and reduced motor activity of patients with LSD-associated pain was made in a number of clinical trials with "STarTBack" which became a routine practice of many clinical specialists around the world [17]. The short version of the "STarTBack" questionnaire takes a short time to complete, and can reliably assign people into groups with low, medium and high risk of potential disability associated with lower back pain. Despite the widespread use of this questionnaire, it is not still a perfect tool for screening patients with LSD-associated pain but it is a useful assistant to the clinical specialist [18].

Current therapy for pain in lumbosacral dorsopathy: recent research and many international experts do not always agree on a common approach to the conservative treatment of pain in LSD. The controversy in the therapeutic data of the existing protocols, in our opinion, is related to the complexity of the pathogenesis of this pathology, such as the pathology of the intervertebral discs, the articular-ligament apparatus of the spine, etc. In addition, there is no universal medicine that could fully meet all requirements of efficiency and safety in the treatment of pain syndrome associated with LSD [19]. Currently, conservative treatment of pain associated with LSD uses a variety of approaches, most of which imply multidisciplinary and multi-component therapy, which confirms and stresses the complexity of the mechanisms of pathogenesis of pain syndrome in LSD [20]. A number of first-line drugs can be used in any period for LSD patients with NSP syndrome [21]. Non-steroid anti-inflammatory drugs (NSAIDs) can be included in the first line of drugs, but their side effects need to be considered and individual selection of cyclooxygenase selective inhibitors (COX) COX-1 or COX-2 [22] should be carried out. An important feature in prescribing treatment for NSP is the duration of the NSAID course, which is limited to 15 days regardless of the pathology [23]. As alternative first-line medications, narcotic analgesics are often used, which effectively relieve pain syndrome. It is worth noting that despite the pronounced analgesic effect of narcotic analgesics, there is a problem of their

prescription. Frequent mistakes of specialists related to calculation of dosage and treatment of narcotic analgesics can contribute to development of drug abuse in patients [24].

Other first-line drugs for treating NSP in LSD patients are corticosteroids. According to M.T.Vogt et al. (2005), corticosteroids reduce the activity of systemic and local inflammatory processes and local destructive biochemical processes in the body [25]. This group of drugs has proven to be an effective anti-inflammatory medicine, subject to reservations of the side effects that arise (Itsenko-Cushing syndrome, hyperglycemia, risk of diabetes mellitus, various infectious processes, disruption of collagen synthesis, and aggravation of gastric and postbulbar ulcer disease [26]. Therefore, hormonal drugs are recommended in a short course in strict dosages or injectable forms of corticosteroids [22].

Second line drugs are considered to be at least as effective as the first line ones for treatment of NSP in LSD patients [27]. These include anticonvulsants whose effect is based on the similarity of their chemical structure to gamma-amino-sulfuric acid (GABA). The active substance molecule binds to $\alpha 2\text{-}\delta$ subunit of potential-dependent calcium channels of nociceptive neuron membrane and their activity decreases [28]. Common adverse effects of anticonvulsants are dizziness, drowsiness, general weakness, which greatly hampers any physical activity of the patient [29].

Muscle relaxants are other second-line drugs that allow relaxing the hypertonic muscles of the posterior part of the trunk, which significantly improves the prediction of recovery of patients with NSP in LSD. Taking muscle relaxants is closely associated with the risk of developing muscle weakness, myalgia, asthenia, sleep and wakefulness disorders [30].

Current application of non-medicament therapeutic methods to LSD patients: non-medicament therapy of NSP in LSD patients is based on the approach to stratification of disability risks associated with chronic pain [31]. As a rule, patients are seeking for medical due to an episode of acute back pain; and in primary care settings, physicians have the opportunity to stratify the patients' condition according to the level of disability risk and choose the subsequent therapeutic intervention tactics [32]. As mentioned earlier, it is preferable to treat low-risk patients with simple conservative methods, such as self-training and pain control programs, resumption of daily activities or re-activation (physical function recovery programs) [33]. People at a higher risk receive more complex therapies to eliminate the risk factors and prevent further development of pain and related disability [34, 35]. The

global awareness of the current recommendations for the treatment of lower back pain is becoming increasingly clear when examining the therapeutic approaches of the past [36]. Until the early 1990s, treatment for episodes of acute lower back pain often involved such interventions as epidural steroid injections, opioid administration, surgery or strict bed rest [37, 38]. However, these interventions were not more effective than natural recovery, and were often expensive and accompanied by serious complications [39]. Due to the excessive number of complications that occurred in the context of the treatment of non-specific lumbar pain, the world medical community decided to switch to early therapeutic intervention programs, often consisting of physical therapy and exercise techniques. However, this approach did not prevent the development of chronic pain [40, 41]. The modern concept of treating NSP was suggested to be formed by understanding that the psycho-emotional factor is fundamental to the development of NSP and the outcome of its treatment. This thesis is supported by P. Jellema who assessed the level of psycho-emotional disorders and the impact of therapeutic factors on the population of patients seeking medical treatment for NSP [42]. Having analyzed the obtained findings P.Jellema, D. Van der Windt et al. (2008), and M.K.Nicholas identified two ways of therapeutic intervention for patients with NSP: targeted therapeutic interventions based on pain-related disability risk factors and ensuring adequate interventions, specifically addressing the relevant issues, including psychological and social risk factors [42, 11, 43]. In the study conducted by A.C.Traeger, the clinical data of patients with LSD-associated pain were analyzed, and there were no signs of specific pathology and structural disorders of the lumbar-sacral spine. Statistically significant differences ($p<0.05$) were obtained between qualitative and quantitative results of treatment for NSP among patients who received the standard therapy and those who were recommended non-medicament therapy with an accelerated program of return to normal daily activities. The patients, having medium to low risk of potential disability and receiving an accelerated program of non-medicament physical recovery, noted higher rates of physical and psycho-emotional components of health faster than patients receiving the standard medication. However, the authors stressed the importance of systematic monitoring of patients with medium and high risk of disability to ensure a rapid response to a NSP relapse or lack of clinical improvement [44].

S.J.Linton et al. (2018) emphasized the importance of special attention and monitoring the therapy provided to patients at a high risk of disability due to NSP.

Although patients in this risk group may initially seek medical attention for acute pain syndrome, which may reflect an exacerbation of chronic conditions, the kinetic specialist should not delay the possibility of applying combined therapeutic methods, as this significantly reduces the risk of disability. If the objectives of therapeutic interventions in high-risk patients remain unclear, the additional psychosocial assessment should be applied before continuing the individual selection of therapies. Psycho-emotional and psycho-social assessment facilitates the most justified therapeutic impact in patients at high risk of disability [45]. Often the treatment of patients with high risk of disability can be a long and complex process; the results of modern therapeutic approach give very encouraging results, but require further clinical study [46, 47].

When treating LSD patients with a high risk of disability and NSP, one of approaches is to offer a psychologically based prevention program as a supplement to medical care. The basis of this technique is to convince the patient that his/her condition is not dangerous and the patient can participate in physical activity during the therapy [44]. High-risk patients are offered a preventive program of cognitive and behavioral therapy aimed at removing barriers to physical activity. This program usually includes methods of "expanding" the physical capabilities of the patient, e.g. re-activation (that means restoring physical function), learning how to reduce anxiety, pain and stress through self-control and solving problems as they occur [14, 11].

Some studies demonstrated a decrease in working ability and treatment demand for a period of 1 to 5 years in high-risk patients stratified by the advanced STarTBack questionnaire, which has proved its effectiveness in LSD patients with NSP [48]. It is worth noting that such methods of cognitive-behavioral therapy and the use of STarTBack-type questionnaires can be applied by both neurologists and specialists in the field of medical rehabilitation and physiotherapy [32, 49]. This increases the availability of psychologically based therapeutic interventions for patients with NSP.

The direct forms of non-medicament therapy for NSP include physical exercise and physiotherapy prior to the beginning of pharmacological treatment, and after a course of medication for pain associated with LSD [50]. Supervised exercise programs are effective to prevent lower back pain and to treat chronic but not acute lower back pain [51]. The type of the exercise program does not seem to matter as many kinds of exercises are useful, including yoga, tai chi, motor control exercises, step-by-step activity and pilates, although many of these exercises are not suitable for

direct treatment. Most of the recommendations are limited to local physical exercises for the spine, but there is evidence of physical rehabilitation with exercises for the whole body, including strength exercises, isometric exercises, and aerobic exercises with cardiovascular parameters. Application of exercises in NSP therapy is usually contraindicated only to patients with lower back pain caused by serious pathology, such as fracture or infection; however, caution or adaptation of the exercise program may be required if patients have such co-morbidities as respiratory or cardiovascular diseases [52].

The recommendations for treatment of chronic lower back pain are consistent. For all patients with pain, initial care should include explaining the causes and self-management of pain, reassuring and encouraging the patients to remain physically active and recommending self-help options (such as analgesia and muscle relaxation). Patients who do not respond to this approach, or patients who need more complex or intensive therapy (based on risk assessment), can obtain additional treatment such as structured exercises, traditional medicine, reflex therapy, physiotherapy, spinal manipulation or cognitive behavioral therapy.

Modern concepts of physical rehabilitation of LSD patients: medical rehabilitation programs, applied to LSD patients with NSP are multidisciplinary interventions and involve several medical professionals [53]. These rehabilitation programs are generally based on a biopsychosocial approach and include: a combination of self-learning, physical, cognitive, behavioral, social and/or work-related components. These rehabilitation programs are often carried out by a team of medical professionals with experience in various fields (neurology/reflexology/manual therapy/physical medicine) [54]. Most programs provide a phased approach to physical activity that recommends patients gradually increase their daily activity in accordance with individual life goals and also gradually reduce the amount of rest and medication [55]. In Cochrane's systematic review conducted by S.J.Kamper, the effectiveness of multidisciplinary rehabilitation programs for patients with non-specific lumbar pain was evaluated. The results showed that multidisciplinary programs were significantly more effective than the standard rehabilitation in which only one medical professional participated [56]. Such programs of multidisciplinary rehabilitation of LSD patients with NSP include protocol "RENaBack" developed and tested by L.Puerto Valencia et al. (2021). This protocol includes both multidisciplinary rehabilitation for patients with NSP and post-operative rehabilitation for patients with specific lumbar-sacral

pain after surgical treatment. The main advantage of this multidisciplinary rehabilitation program is the patient's compliance, as well as the possibility of applying protocol "RENaBack" to patients living far from major medical centers [56].

Program "RÜCKGEWINN", developed by a team of specialists led by C.Hentschke for patients with chronic non-specific lumbar pain, offers multidisciplinary rehabilitation for both out-patient and neurological patients. This program is considered effective, but the multicenter study showed some logistical and methodological problems when using RÜCKGEWINN protocol [57]. R.M. Van Erp presented the primary health care program as a multidisciplinary rehabilitation program "Back on Track" for patients with NSP associated with LSD. This protocol implies a biopsychosocial model of integrated therapeutic intervention in primary health care facilities. The efficiency of application of "Back on Track" protocol, analyzed in the multicenter study, demonstrated high financial efficiency owing to early detection of patients with high risk of disability and timely provision of appropriate therapeutic care through active use of physical therapy devices [58].

There is a large number of published data on the impact of various protocols of multidisciplinary rehabilitation of LSD patients suffering from NSP and the effectiveness of their application [59, 60, 61]. Recently, however, there has appeared a growing body of evidence comparing the evaluation of the effectiveness or joint application of so-called "Western" therapeutic techniques and traditional medicine methods (Chinese/Korean/Indian). One of such study is the work of H.Y.Lee et al. (2021) who analyze the comparative effectiveness of traditional Korean and "Western" medicine among patients with various types of neurological pain, including non-specific lumbar pain. In a multi-center prospective study, the researchers included 150 patients with non-specific lumbar pain from 7 South Korean medical institutions. The participants of the study had individual plans of therapeutic interventions; one group of patients was treated by the traditional methods of Korean medicine (TKM), (acupuncture and manual therapy), the second group, was treated according to the protocol of multidisciplinary "Western" medicine and the third group of patients received the combined therapy including TKM and "Western" methods. The effectiveness was assessed through the analysis of the ODI Disability Index and the Quality of Life Questionnaire (QSL) EuroQol 5 (EQ-5D-5L). The researchers noted that those patients with lumbar-sacral NSP, who received TKM interventions, had better results, compared to the patients with pain syndrome,

who were included in the program of "Western" treatment methods [62]. In another study of the clinical and economic efficiency of TKM in the form of manual intervention method "CHUNA", B.C.Shin and K.T.Lim revealed significant effectiveness of TKM "Chuna" among patients with chronic non-specific lumbar-sacral pain, especially in combination with drug therapy [63, 64]. The use of acupuncture in cases of chronic NSP in LSD does not play a significant therapeutic role, which is supported by major scientific studies over the past 20 years. Despite this, acupuncture undoubtedly has wide application among patients with acute neurological pain as well as myofascial pain syndrome [65, 66, 67, 68]. The centuries-long history of East Asian traditional medicine certainly has great relevance and potential effectiveness in addressing the problem of complex therapeutic effects in patients with chronic pain associated with LSD [62]. Hence, one of the most promising traditional therapeutic interventions for patients with non-specific pain in the lumbar-sacral area is TKM. The mechanism of action of TCM is based on manual and acupuncture therapy, which allows applying a directed stimulating effect on the peripheral nervous system. In turn, it reduces pain syndrome through excitation of tactile proprioceptive sensitivity improving the impulse passing in the motor and sensor system [69].

The opposite, in the scientific sense, method of both rehabilitation of patients and therapy is physical therapy (e.g. the ultrasonic effect on the damaged area by high-frequency sound waves; magnetotherapy; amplipulserapy; diadynamic currents; laser therapy; darsonvalization; detector therapy; shock-wave therapy; ultraviolet radiation). Application of physiotherapy to NSP in LSD patients is considered to be a sufficiently studied and developed direction of research. Various physiotherapy methods combined with physical rehabilitation techniques are included in many multidisciplinary rehabilitation programs for LSD patients with NSP. Notable physiotherapy techniques include magnetic stimulation of the paravertebral, square and deep lumbar muscles, and transcranial magnetic stimulation (TMS) for chronic and acute NSP associated with LSD. It is important that, unlike other physiotherapy methods, TMS is not only a method of rehabilitation, but it has the potential of a separate method of treatment of this category of patients. For example, the study conducted by S.Shafiee demonstrated the pronounced effect of TMS against the background of safe stimulation of cortical neurons and reduction of chronic pain conditions. In addition, the authors stressed that repeated transcranial stimulation can increase neuroplasticity, which inevitably leads to long-term therapeutic effects [70].

In the study carried out by M.Ambriz-Tututi , TMS therapy for 7 procedures made once a day to LSD patients with NSP leads to long-term pain relief without any side effects [71]. E.J.Park was able to confirm the clinical effectiveness of TMS in the treatment of chronic pain in LSD patients. In addition, the author stressed the pronounced clinical effect on chronic pain associated with depression and insomnia [72]. Over 786 publications, including 61 placebo-controlled studies (3682 people), in PubMed.gov describe application of TMS in depression. The effect of TMS in depression can be explained by the fact that excitation by means of high-frequency TMS of the prefrontal cortex can activate the regulatory pathways that link this region to the limbic system responsible for emotional response and mood regulation [73]. It should be noted that rather satisfactory effect of TMS application is directly related to the pathogenetic mechanism, i.e. disturbed excitability and/or reorganization of the motor cortex of the brain, leading to proprioceptive pain [74]. It is believed that the use of modalities that precisely guide changes in the motor cortex under XBP can not only reverse these changes and improve clinical outcomes, but also reduce to some extent the degree of disability, as well as influence the quality of life in patients with NSP syndrome of the lumbar region [75].

CONCLUSION

Considering the above, pain syndrome associated with lumbosacral dorsopathy (LSD) continues to pose a major global healthcare challenge, highlighting the ongoing need for refined therapeutic strategies. While effective management of this syndrome can significantly reduce the risk of disability, the path to achieving optimal outcomes remains complex. Current research reflects the use of diverse therapeutic and rehabilitation approaches in treating patients with chronic pain. However, only limited studies have explored the potential benefits of integrating pharmacological treatment with traditional medicine and physiotherapy techniques such as transcranial magnetic stimulation (TMS) in LSD-related pain management. Although each modality has shown promise individually, their combined effect, especially in terms of enhancing patients' quality of life, remains under-investigated. Further exploration into how these methods interact and contribute to recovery may offer new insights into comprehensive treatment models. Understanding the factors that influence the quality of life in individuals with chronic lower back pain is therefore crucial in shaping future interventions. In light of this, the present study aims to evaluate how a multidisciplinary treatment approach affects quality of life in patients with chronic pain caused by LSD.

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