Treatment Utilizing a Muscle Energy Technique and the MyoKinesthetic System on Patients With a Diagnosed Disc

Jena A. Hansen-Honeycutt • George Mason University and University of Idaho;
Alan M. Nasypany and Russell T. Baker • University of Idaho

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Two physically active patients presented with low back pain (LBP) and were previously diagnosed with a herniated disc. A unique treatment combination of a muscle energy technique (MET) and MyoKinesthetic (MYK) treatments were used to decrease pain and improve function. The treatment combination displayed clinically significant short-term improvements in four treatments or less and both patients reported no recurrence of pain at their 1-year follow-up. It is questionable if the presence of an anatomical abnormality, such as a herniated disc, is truly the source or unrelated to those experiencing LBP; utilizing a MET and MYK treatment may be beneficial for other patients reporting similar symptoms.

KEY POINTS

- LBP is not always directly correlated to structural abnormalities.
- Treatment utilizing MYK may be effective for patients presenting with LBP.
- MYK produced positive patient outcomes in function and pain.

Low back pain (LBP) is a common musculoskeletal complaint from those participating in physical activity, with an incidence ranging between 1% and 30% of all athletic injuries.[1] A structural abnormality may be the cause of pain, but more often LBP is not associated with such findings.[2,3] For instance, faulty posture and an increased lumbar lordosis have been correlated to LBP.[1,4] Another potential cause of LBP is a disc abnormality where the disc herniation or bulge places pressure on the nerves of the spinal canal. When this occurs, commonly, the nucleus protrudes out of the annulus fibrosis limiting the room for the spinal nerve, thereby producing pain or symptoms. Disc abnormalities, however, do not appear to be fully predictive of the presence of low back pain; researchers have studied asymptomatic populations and found that 57% and 64% of the participants without a history of LBP had disc abnormalities when examined using magnetic resonance imaging (MRI).[2,5] Therefore, it is not unreasonable to suggest that LBP commonly attributed to a herniated disc or bulge could actually be stemming from another causative factor.

Exploring a variety of theories and treatment options is imperative to help patients find relief from LBP given the multifactorial nature of LBP. Common options for conservative care are chiropractic, massage, pharmacological, rehabilitation, and physical therapy interventions. [6] Surgical interventions (e.g., microdiscectomy, spinal fusion, laminectomy) are typically considered if conservative care fails after 4–6 weeks.[1,7–9] Even in patients whose nonspecific LBP resolves, it has been documented to have a recurrence rate up to 90%.[10]

A current and well-accepted theory suggests that the cause of LBP stems from the changes in motor control, postural control, or stability of the core, and not from the structural abnormalities.[4,11,12] There has been an influx in clinicians utilizing this theory to support restoring core stability for patients reporting LBP.4 However, the high recurrence rate of LBP suggests that the true source of the pain has not been identified.[1,4,10] The inconsistent patient outcomes in regard to traditional conservative care and high recurrence rates of LBP led the author to use a novel and uncommon treatment combination of a muscle energy technique (MET) and a MyoKinesthetic treatment.

The MyoKinesthetic (MYK) System is a postural assessment and treatment for nerve pain, muscle pain, muscle imbalances, and postural imbalances.[13,14] The treatment includes passive and active movement along with stimulation by palpation for specific muscles, bilaterally, along a particular nerve pathway.[13–15] The goal of the treatment is to clear any irregularities in signals delivered by the peripheral nervous system (PNS) along a single nerve pathway, therefore having a specific impact on the central nervous system (CNS) which in turn restores proper postures.15 Theoretically, by treating the muscles along one nerve pathway, the information is sent to the spinal cord and brain where the information is then reprocessed and delivered to the muscles clearing the previous compensations and imbalances.15 The MYK treatment is proposed to target the CNS and PNS to restore motor control patterns and postural imbalances that may cause musculoskeletal pain. The purpose of the following case reports is

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to provide an example of a novel LBP treatment that provided immediate and long-lasting results in restoring function and decreasing pain in two patients suffering from LBP who had previously been diagnosed with a herniated disc.

PATIENTS

Two patients presented with a previous diagnosis of a herniated disc by another healthcare professional. The same clinician evaluated and treated the patients. Each patient provided written consent for participation. Both patients denied spinal trauma but had similar symptoms including radiating pain into the buttock or legs, and sharp localized pain between the lumbar spine vertebrae 5 (L5) and sacrum. Upon examination, both patients presented with unremarkable leg length tests and had no obvious deformity or obvious edema. Both patients exhibited a dysfunction of the sacroiliac joint during the March test. A summary of each patient's history and initial physical examination is provided in Table 1.

INTERVENTION

After history and initial exam, both patients were initially treated with MET. Because a sacroiliac (SI) joint dysfunction has been identified as a source of LBP,16 a MET was used before the MYK treatment in attempt to restore SI joint function and decrease pain. The patient was side lying on the opposite side of the pelvic girdle/SI joint dysfunction, with hands across the chest. The leg was not in contact with the table when placed into hip and knee flexion. Once in this position, the patient was instructed to abduct hip against resistance, then

TABLE 1 INITIAL HISTORY AND PHYSICAL EXAM OF EACH PATIENT

Patient	Age (years)	Sex	Initial History and Physical Examination
1	26	Female	Patient #1 was a 26-year-old female who reported low back pain with sudden onset after tumbling during a cheerleading practice 9 years before this evaluation. Patient went to primary care doctor and was diagnosed with a herniated disc of L5. Patient received two MRIs over course of treatments and both were positive for a herniated disc at L5. Initial treatment included pharmacological interventions, two epidurals, chiropractic care, massage, and physical therapy, all providing moderate relief. The physical therapy, chiropractic care, and massage provided pain relief for 2–4 weeks. The epidurals provided relief for 8 months. Patient was point tender over bilateral posterior superior iliac spine, quadratus lumborum, and L4 and L5 transverse processes. Neurological exam had only a positive Slump test. Previously, the patient reported experiencing radiating pain into the buttock with sitting or standing for prolonged periods of time, but was not currently experiencing this type of pain. The patient's primary complaint was constant dull pain rated a 3 of 10 on NRS at rest and inability to sit or stand for prolonged periods of time since initial injury. Range of motion and strength tests for the hip were unremarkable. MYK postural assessment indicated L5 imbalance.
2	23	Male	Patient #2 was a 23-year-old male who reported not feeling right after sitting up after a set of bench presses. The following day he woke up with pain rated 6 of 10 on NRS and inability to touch toes. Patient was diagnosed with a herniated disc by another athletic trainer; after the examination the patient reported to seek treatment from the researcher/author. Patient reported an increase in pain with trunk flexion. Patient was point tender bilaterally over quadratus lumborum, erector spinae, and over L5 spinous process. Neurological exam was positive for only the Slump test and patient reported radiating pain into buttock. Patient reported that the pain felt deeper than the clinician could palpate and inability to complete activities of daily living such as tying his shoes. Range of motion and strength tests for the hip were unremarkable. MYK postural assessment indicated L5 imbalance.

Abbreviations: MRI = magnetic resonance imaging; NRS = Numerical Rating Scale; MYK = MyoKinesthetic.

Table 2 Active and Passive Movements and Muscles Stimulated by Palpation During MYK L5 Treatment

Active and Passive Movement	Muscles Stimulated by Palpation
Hip adduction	Gluteus medius
	Gluteus minimus
Hip extension/adduction	Tensor fascia latae
Hip flexion	Gluteus maximus
Hip abduction	Adductor magnus
Knee extension	Semimembranosus
	Semitendinosus
	Biceps femoris
Torso flexion	Iliocostalis lumborum
	Intertransversarii
	Interspinales
	Multifidus
Active and Passive Movement	**Muscles Stimulated by Palpation**
Hip medial rotation	Gemellus inferior
	Gemellus superior
	Obturator internus
	Quadratus femoris
Dorsiflexion with inversion	Peroneus longus
	Peroneus brevis
Dorsiflexion with eversion	Tibialis posterior
	Flexor hallucis longus
	Flexor digitorum longus
Plantar flexion with inversion	Extensor digitorum longus
	Peroneus tertius
Plantar flexion with eversion	Tibialis anterior
	Extensor hallucis longus
Plantar flexion	Extensor hallucis brevis
	Extensor digitorum brevis
Knee rotation	Popliteus
Big toe adduction	Abductor hallucis
Big toe abduction	Adductor hallucis
Foot dorsiflexion	Flexor digitorum brevis
	Lumbricals
Big toe extension	Flexor hallucis brevis

Table 3 Patient-Reported GRC Pretreatment and NRS Before and After Each Treatment

Patient #1				Patient #2			
Treatment #	GRC	NRS Pre	NRS Post	Treatment #	GRC	NRS Pre	NRS Post
1. MET	2	3/10	2/10*	1. MET	3	6/10	6/10
2. MYK L5	5*	2/10	0/10*	2. MYK L5	6*	6/10	3/10*
3. MYK L5	7*	0/10	0/10	3. MYK L5	7	4/10	1/10*
				4. MYK L5	7	1/10	0/10*

Abbreviations: GRC = Global Rate of Change; NRS = Numerical Rating Scale; MYK = MyoKinesthetic.

* Minimal clinically important difference.

pull the hip into extension against resistance. The patient was then asked to lie in a hook-lying position and complete isometric contraction of hip adductors (3×) and abductors (3×) for 6 s each. The MET did restore normal pelvic girdle function; however, the technique did not completely resolve their symptoms.

The patients reported that they continued to experience pain and difficulty with functional activities. This led the clinician/researcher to seek a treatment that would target the CNS and PNS that may be contributing to the patient's complaint of pain with functional activities; thus, specifically, a MYK treatment seemed to be indicated. Table 2 lists the muscles treated and movements associated with the MYK L5 treatment.[15] At the second visit, a MYK L5 treatment was used in both patients based upon the MYK posture assessment. The following appointment, the patient was instructed that the MYK treatment include stimulation/massage of all muscles innervated by the L5 nerve root level bilaterally while performing passive and active movements to decrease pain and improve function. The pain-intensity Numerical Rating Scale (NRS) and Disablement in the Physically Active (DPA) scale were used as patient-oriented outcome tools to measure improvements.[17,18] The Global Rate of Change (GRC) (11-point scale) was used at the beginning of the appointment to measure global progress from previous treatment.[19] Orthopedic tests and functional movement were also used to measure progress of physical limitations. As shown in Table 3, the NRS was collected pre- and posttreatment and GRC was collected at baseline and at the beginning of each treatment to retrospectively monitor change between treatments. Figure 1 illustrates the DPA scale score collected at initial examination, 1 week, and 1 month.

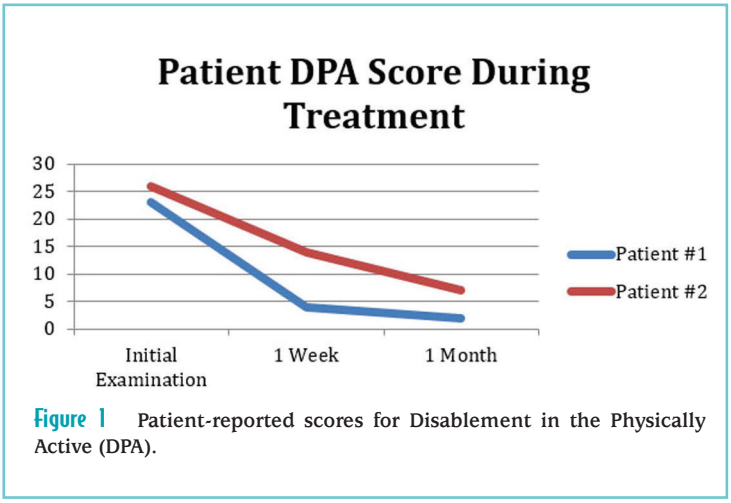

Figure 1 Patient-reported scores for Disablement in the Physically Active (DPA).

COMPARATIVE OUTCOME

Patient #1 was initially treated with a MET to correct the pelvic girdle dysfunction and then presented with a negative March test. The patient reported a minimal clinically important difference (MCID) on the NRS after the MET treatment (Table 3). The patient returned to the clinic 2 days later and reported a 2 of 10 NRS score and a MCID for GRC (Table 3). When the patient was reexamined, she maintained normal pelvic girdle function and received a MYK L5 treatment to correct lingering complaints

Figure 2 Patient #2 toe-touch pre and post first MyoKinesthetic L5 treatment.

of pain and inability to stand for prolonged periods of time. Posttreatment, the patient reported a MCID on the NRS (0 of 10) (Table 3). At the 1-week follow-up, the patient reported a MCID for GRC and the DPA scale (Table 3; Figure 1). Patient #1 continued to complain of "tightness where the pain used to be" and received another MYK L5 treatment; posttreatment there was no change in NRS (0 of 10). At a 1-month follow-up visit, patient #1 reported a MCID for GRC and the DPA scale and was discharged (Table 3; Figure 1). At the patient's 1-year follow-up appointment, the patient reported a 0 of 10 NRS without any recurrences of LBP.

Figure 3 Patient #2 toe-touch pre and post second MyoKinesthetic L5 treatment.

Patient #2 was initially treated with MET to correct the pelvic girdle dysfunction and reported no change on the NRS, however did present with a negative March test. The patient returned to the clinic 4 days later and reported no change in NRS and, upon reexamination, maintained normal pelvic girdle function. The patient remained unable to touch his toes and received a MYK L5 treatment to decrease pain and improve function. After the MYK L5 treatment, the patient reported a MCID was met for the NRS (3 of 10). The patient returned to the clinic after 2 days reporting a MCID on GRC and the DPA scale (Table 3; Figure 1). The patient received another MYK L5 treatment. The patient's NRS pretreatment was 4 of 10. Posttreatment, a MCID was met on NRS (1 of 10) (Table 3). At the patient's 1-week follow-up appointment, the patient complained of limited range of motion touching his toes and was experiencing intermittent pain (NRS 1 of 10). Figure 2 displays a picture of his toe-touch pre and post his first MYK treatment. Figure 3 displays toe-touch pre and post his second MYK treatment. A third MYK L5 treatment reduced the patient's pain from 1 of 10 to 0 of 10. At this time, the patient was discharged from treatment. At discharge the slump test was negative. At a 1-month follow-up, the patient reported a MCID for GRC and the DPA scale (Table 3; Figure 1). At a 1-year follow-up the patient reported a 0/10 NRS without any recurrences of LBP since treatments concluded.

DISCUSSION

The findings of the two patients within this Exploratory Clinical CASE Report presented unique patient outcomes compared with those experiencing LBP and presenting with a herniated disc. Each patient reported MCID for a variety of patient outcome measures and reported all symptoms resolved in four treatments or less. In another case study,[13] the MYK posture assessment and treatment produced similar Positive patient outcomes in a patient that had failed typical conservative treatment and surgical interventions; the patient reported full resolution of pain in seven treatments in 2 weeks and was discharged after 10 treatments.[13] The patient in the case study by Brody et al.13 and the patients in this manuscript present two separate examples of positive outcomes in improving function and decreasing pain by utilizing the MYK system.

In this Clinical CASE Report, both patients received a MET first and it was beneficial in restoring normal pelvic girdle function when assessed using the March test. The effects of this unique treatment combination (i.e., MET and MYK) resulted in both patients reporting full pain and dysfunction resolution in 2 weeks from initial treatment for a herniated disc. Patient #2 far exceeded normal rehabilitation time frames for an acute onset of LBP, whereas patients successfully completing traditional conservative care typically have resolution of symptoms in 4–8 weeks.[7,20] Additionally, depending on the results of diagnostic imaging, a patient reporting LBP for 9 years (patient #1), who failed conservative care, would most likely undergo surgery to decrease pain and improve quality of life. Nonetheless, long-term patient outcomes following a surgical intervention are unconvincing that surgery will decrease pain and/or improve quality of life.[21–24] It is unknown if only MYK treatments or a combination of MET and MYK treatments is necessary to produce comparable results in other patients who have similar symptoms.

It has been reported, that regardless of whether a patient successfully completes conservative care, up to 45% of patients go on to receive a surgical intervention. [7,23] The discouraging short and long-term success with typical conservative care and surgery often leave patients looking for other options. Both patients reported no episodes of LBP between discharge and their 1-year follow up. Weinstein et al.[23] found that there was no difference in long-term outcomes when comparing surgery to conservative care options.[7] Furthermore, Parker et al.[9] reported that 22% of patients after a discectomy reported worsening of back pain or disability at a 1-year follow-up; this in turn led to reporting a decrease in quality of life and general health state.[9] Additionally, patient #1 reported that this was the longest period of time since initial injury with no episodes of LBP. The MET and MYK treatments provided positive short- and long-term results and could be viable options for many patients experiencing LBP.

There are a variety of conservative care treatment options for those experiencing LBP, however the high recurrence rate of LBP suggests that the treatments might not appropriately target the source of pain.[10] Many patients are told that the source of their pain is from anatomical abnormalities such as a bulged or herniated disc, even though many patients who do not have any associated symptomology also have these abnormalities on MRI.[2,5] In accordance with other proposed theories, the LBP in these patients could be stemming from changes in the CNS and PNS motor control and core stability patterns. Theoretically, the MYK treatment creates postural changes through the CNS and PNS and it appears that MYK might be a treatment to significantly decrease time loss from injury and aid patients in restoring optimal function.14,15 It should be noted that even though both of the patients received a L5 MYK treatment, other patients should receive a MYK treatment based upon their postural assessment regardless of the location of structural abnormalities. The MYK postural assessment may indicate the same or different level of the structural abnormality.

Further research is needed to explore if a decrease in time loss from injury using MET and MYK treatments can be expected in other patients presenting with similar symptoms. Also, it would be beneficial to understand if the same results could be produced using only the MYK system, as seen in the Brody et al. case study.[13] Additional research is needed to identify if various anatomical abnormalities correlate to postural imbalances leading to specific MYK treatment suggestions. Lastly, it is essential that future research examines the current theory of anatomical abnormalities as always the source of LBP; this is crucial to improving patient outcomes.

CLINICAL BOTTOM LINE

In two patients diagnosed with a herniated disc at L5, utilizing MET and the MYK system produced improvements in pain and function. Thus, it remains questionable whether the presence of a herniated disc was the cause, a contributor, or unrelated to LBP. The improvements in these two patients was clinically significant utilizing a MET and the MYK system and may be beneficial for other patients reporting similar symptoms.

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Jena A. Hansen-Honeycutt is with George Mason University, Fairfax, VA; and the University of Idaho, Moscow, ID.

Alan M. Nasypany and **Russell T. Baker** are with the Department of Movement Sciences, University of Idaho, Moscow, ID.

Trent Nessler, PT, DPT, MPT, Champion Sports Medicine/ Physiotherapy Associates, is the report editor for this article.