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Original Article

Compare the Effects of Bowen Technique and Muscle Energy Technique on Hamstrings Tightness in Patients with Chronic Low Back Pain

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ABSTRACT

Background: Chronic low back pain (CLBP) is a prevalent condition affecting a significant portion of the global population, leading to decreased quality of life and increased healthcare utilization. Previous research has identified manual therapies, such as the Muscle Energy Technique (MET) and the Bowen Technique, as potential interventions for reducing pain and improving functional outcomes in patients with CLBP. These techniques focus on reducing muscular tightness and improving flexibility, which are often implicated in the etiology of low back pain.

Objective: The aim of this study was to compare the effects of the MET and the Bowen Technique on hamstring tightness and pain reduction in patients with CLBP.

Methods: This randomized controlled trial included 62 participants with CLBP, who were divided into two groups to receive either the MET or the Bowen Technique. The interventions were administered over an 8-week period, with sessions occurring three times per week. Outcome measures included hamstring flexibility (measured by the Active Knee Extension Test), pain intensity (measured by the Visual Analogue Scale), and functional disability (measured by the Oswestry Disability Index). Data were analyzed using repeated measures ANOVA and independent t-tests.

Results: Both groups showed significant improvements in all measured outcomes. Participants in the MET group demonstrated a greater reduction in pain intensity from baseline to 8 weeks (5.5161±1.20750 to 1.4839±1.15097, P<0.000) compared to the Bowen Technique group (7.2258±0.88354 to 0.2581±0.51431, P<0.000). Similarly, hamstring flexibility and functional disability scores improved significantly in both groups, with the MET group showing slightly more substantial improvements in functional disability.

Conclusion: The study concluded that both the MET and the Bowen Technique are effective interventions for reducing pain and improving hamstring flexibility in patients with CLBP. However, the MET showed a slight advantage in improving functional disability outcomes.

Keywords: Chronic Low Back Pain, Muscle Energy Technique, Bowen Technique, Hamstring Tightness, Functional Disability, Pain Reduction, Manual Therapy, Randomized Controlled Trial.

INTRODUCTION

Low back pain (LBP) represents a significant global health challenge, affecting an estimated 84% of the adult population at some point in their lives, leading to restrictions in daily activities, decreased work productivity, and increased healthcare utilization (1,2). The annual incidence of LBP varies significantly across regions, with reports indicating a 1.5% incidence in Kuwait and up to 36% in the United Kingdom (3). A comprehensive review of the literature reveals a widespread prevalence of chronic low back pain (CLBP) in Western countries, ranging from 49% to 70%, with European countries reporting approximately 20% and the United States 13.1%, based on surveys conducted between 2009 and 2010 (4). The etiology of LBP is multifactorial, involving structural and functional abnormalities of the vertebrae, muscular spasms, emotional and physical stressors, and biomechanical issues (5,6). Inflammatory processes further exacerbate tissue misalignment and damage, leading to enhanced pain perception through the accumulation of

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substance P in nerve terminals and a subsequent reduction in lumbar region muscle strength (7-9). The socio-economic impact of CLBP is profound, as affected individuals experience significant limitations in their ability to perform daily activities, leading to social isolation and increased reliance on medical interventions for pain management.

CLBP is characterized by persistent pain in the lower lumbar region lasting more than twelve weeks, with its origins attributed to a variety of factors including, but not limited to, injury, comorbidities, and various physical triggers (10). Notably, disc herniation and spondyloarthropathies are recognized as common causes of specific lumbar pain, contributing to nerve root compression and paresthesia. An important aspect of CLBP management involves addressing hamstring flexibility, which is occasionally used interchangeably with the ability of the posterior thigh muscles to extend to their full range of motion. Given that both the back muscles of the trunk and the hamstring muscles originate from the pelvic bone, they share a synergistic relationship that influences pelvic rotation. A decrease in the elasticity or strength of these muscles can compromise the functional integrity of the other, resulting in reduced pelvic rotation and consequent lumbar pain (11).

Within the scope of therapeutic interventions for CLBP, the Bowen Technique and Muscle Energy Technique (MET) have been documented for their efficacy in various conditions (14-17). The Bowen Technique, developed by Tom Bowen in Australia, is a soft tissue restorative therapy that involves the application of gentle rolling motions on specific muscles or connective tissues using the fingers and thumbs, typically ranging from fifteen to forty-five minutes per session (12). Conversely, MET is recognized as a manual therapy and active muscle relaxation technique aimed at treating soft tissue injuries, employing a methodical approach to facilitate muscle relaxation and lengthening (13).

Despite the availability of various interventions supporting improvements in pain and flexibility among CLBP patients, research specifically addressing the impact of these techniques on hamstring flexibility is limited. Therefore, this study aims to fill a gap in the literature by comparing the effects of the Bowen Technique versus MET on hamstring tightness in patients with CLBP. Such a comparison is vital, as it has not been previously documented in this patient population, offering potential insights into optimizing therapeutic strategies for enhancing flexibility and reducing pain in individuals afflicted by chronic low back pain.

MATERIAL AND METHODS

This randomized controlled trial was conducted from January to September 2020, following approval from the Institutional Review Board, to evaluate the effects of the Bowen Technique and Muscle Energy Technique on hamstring tightness in patients with chronic low back pain. The study adhered to the ethical principles outlined in the Declaration of Helsinki, ensuring respect for the autonomy, privacy, and welfare of all participants. Data collection occurred at Madinah Teaching Hospital, Faisalabad, with a calculated sample size of 62 subjects using the open epi tool, considering a power of 80% and a level of significance of 5%.

Informed consent was obtained from all participants, ensuring they were fully aware of the study's purpose, procedures, potential risks, and benefits. Following consent, subjects were randomly allocated to two groups using a lottery method to ensure the unbiased distribution of participants. The inclusion criteria targeted individuals aged 25 to 50 years, experiencing low back pain symptoms for more than three months, reporting a pain intensity of ≥6 on the Visual Analogue Scale (VAS), exhibiting 20° to 50° active knee extension loss with the hip in 90° of flexion, and possessing full passive range of motion of knee extension to exclude intra-articular knee joint pathology. Exclusion criteria encompassed patients with a history of lower limb injury, back, pelvis, hip, or knee surgery within the past three months, neurological symptoms indicating a prolapsed intervertebral disc or radiating pain, comorbidities other than chronic low back pain and hamstring tightness, and pregnancy.

Group A received treatment with hot packs, Transcutaneous Electrical Nerve Stimulation (TENS), and the Bowen Technique, whereas Group B underwent therapy with hot packs, TENS, and the Muscle Energy Technique. For both groups, the initial intervention involved applying a hot pack to the hamstring muscles and TENS (100 Hz frequency, 60s pulse duration, 10-minute duration) to the lower back. The Bowen Technique involved applying gentle pressure and manipulation to the target muscles, while the Muscle Energy Technique entailed passive stretching and isometric contractions of the hamstrings. Each treatment session lasted 30 minutes, with a total of 24 sessions (three sessions per week) over an 8-week period.

Outcome measures included hamstring flexibility, pain intensity, and functional disability, assessed using the Active Knee Extension Test (AKT), Visual Analogue Scale (VAS), and Oswestry Disability Index (ODI) at baseline and after the 2nd, 4th, 6th, and 8th weeks of treatment. Data were analyzed using SPSS version 25, employing repeated measures ANOVA and independent t-tests to compare outcomes between and within groups over time. This comprehensive approach ensured the meticulous evaluation of the interventions' effectiveness in addressing hamstring tightness and associated symptoms in patients with chronic low back pain.

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RESULTS

In this randomized controlled trial, demographic data at baseline revealed an average age of 43.9±6.5 years in Group 1 and 42.7±7.7 years in Group 2, highlighting a comparable age distribution between the two groups [Table 1]. Gender distribution across the groups indicated a higher prevalence of female participants (Group 1: 25 females, 6 males; Group 2: 21 females, 10 males), consistent with the overall study population's gender ratio. Additionally, a significant proportion of participants had received previous treatment for chronic low back pain (CLBP), with 30 in Group 1 and 29 in Group 2 reporting such interventions, indicating a history of engagement with healthcare services for CLBP management.

Descriptive statistics for pain intensity, as measured by the Visual Analogue Scale (VAS), demonstrated a notable decrease in both treatment groups over the 8-week study period [Table 2]. Initially, Group A reported a mean VAS score of 7.2258 (SD=0.88354), which significantly reduced to 0.2581 (SD=0.51431) by the study's conclusion. Group B started with a slightly lower mean VAS score of 5.5161 (SD=1.20750), which also decreased to 1.4839 (SD=1.15097). These results underline the efficacy of both treatment modalities in pain reduction among participants with CLBP.

Regarding hamstring flexibility, as assessed by the Active Knee Test (AKT), both groups exhibited significant improvements [Table 3]. From a baseline mean AKT score of 43.2581 (SD=9.63662) in Group A and 37.2258 (SD=6.22206) in Group B, scores improved to 0.4516 (SD=2.33579) and 0.0000 (SD=0.00000), respectively. These outcomes signify the positive effects of the interventions on enhancing hamstring flexibility, an important factor in the management of CLBP.

Table 1: Demographic Data of Participants at Baseline

Variable	Group 1	Group 2
Age (years)	43.9±6.5	42.7±7.7
Gender (Male)	6	10
Gender (Female)	25	21
Previous Treatment	30	29
No Previous Treatment	22	22

Table 2: Descriptive Statistics for Pain (VAS) in Treatment Groups

Timepoint	Group	Mean	Std. Deviation	N	P value
Baseline	A	7.2258	.88354	31	0.000
	B	5.5161	1.20750	31	
After 2 weeks	A	5.4516	.85005	31	
	B	4.5161	1.20750	31	
After 4 weeks	A	3.5161	.81121	31	
	B	3.5161	1.20750	31	
After 6 weeks	A	1.6774	.65254	31	
	B	2.4839	1.15097	31	
After 8 weeks	A	.2581	.51431	31	
	B	1.4839	1.15097	31	

Table 3: Descriptive Statistics for AKT in Treatment Groups

Timepoint	Group	Mean	Std. Deviation	N	P value
Baseline	A	43.2581	9.63662	31	0.000
	B	37.2258	6.22206	31	
After 2 weeks	A	30.4516	9.58067	31	
	B	27.0645	5.40330	31	
After 4 weeks	A	18.0968	8.67700	31	
	B	16.9032	4.65729	31	
After 6 weeks	A	6.7419	6.47543	31	
	B	6.8710	3.75714	31	
After 8 weeks	A	.4516	2.33579	31	
	B	0	0	31	

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Table 4: Descriptive Statistics for ODI in Treatment Groups

Timepoint	Group	Mean	Std. Deviation	N	P value
Baseline	A	65.6129	8.22061	31	0.000
	B	68.2581	9.64354	31	
After 2 weeks	A	57.8710	7.99892	31	
	B	52.0645	8.77092	31	
After 4 weeks	A	49.8065	7.83760	31	
	B	35.4839	8.73259	31	
After 6 weeks	A	40.9032	7.79468	31	
	B	15.7419	7.07563	31	
After 8 weeks		16.0968	5.99641	31	
		6.9355	6.20718	31	

Table 5: Tests of Between-Subjects Effects of VAS, AKT, ODI

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Intercept						
	517998.658	1	517998.658	1912.466	.000	.970
Group (VAS)	8320.116	1	8320.116	30.718	.000	.339
Error	16251.226	60	270.854			
Intercept						
	108478.713	1	108478.713	671.475	.000	.918
Group (AKT)	370.713	1	370.713	2.295	.135	.037
Error	9693.174	60	161.553			
Intercept						
	3938.790	1	3938.790	897.065	.000	.937
Group (ODI)	1.165	1	1.165	.265	.608	.004
Error	263.445	60	4.391			

Functional disability, measured using the Oswestry Disability Index (ODI), showed marked reductions in both groups, indicating improved functional outcomes following treatment [Table 4]. Group A's mean ODI score decreased from 65.6129 (SD=8.22061) at baseline to 16.0968 (SD=5.99641), while Group B's score lowered from 68.2581 (SD=9.64354) to 6.9355 (SD=6.20718). The substantial reduction in ODI scores reflects significant improvements in daily functional capabilities of participants, contributing to enhanced quality of life.

The statistical analysis, focusing on the between-subjects effects of VAS, AKT, and ODI, highlighted the interventions' impact on the study outcomes [Table 5]. The analysis revealed a significant reduction in pain (Group (VAS): F=30.718, P<.000, partial eta squared=.339), indicating a robust treatment effect on pain reduction. However, the group differences for AKT and ODI did not reach statistical significance, suggesting comparable efficacy of the treatment modalities in improving hamstring flexibility and reducing functional disability among participants.

Collectively, these results emphasize the effectiveness of both treatment modalities in reducing pain, enhancing hamstring flexibility, and improving functional outcomes in individuals with CLBP, thereby supporting their incorporation into comprehensive treatment strategies for CLBP management.

DISCUSSION

In the examination of the efficacy of the Muscle Energy Technique (MET) and the Bowen Technique in treating chronic low back pain, this study found that both interventions significantly reduced pain and hamstring tightness among participants. However, it was observed that the MET yielded slightly better outcomes in terms of functional disability reduction. This aligns with the broader body of literature, which has explored various manual therapies for low back pain and their impact on muscle flexibility and pain perception.

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For instance, Marr et al. (12) conducted a study focusing on the Bowen Technique's ability to alleviate tightness in the hamstrings, employing a sample size of 120 and administering three sessions of the Bowen approach. Their findings indicated a notable improvement in knee extension and a reduction in knee flexion tightness among participants who received the Bowen treatment, compared to those who did not receive any intervention. Similarly, our study's results support the effectiveness of the Bowen Technique in significantly reducing hamstring tightness ($P<0.000$), thereby corroborating Marr et al.'s conclusions.

Conversely, Naik et al. (23) investigated the MET's effectiveness alongside the Positional Release Technique (PRT), administering these treatments to a cohort of 60 subjects over an eight-day period. They reported that both techniques were equally effective in diminishing lumbar pain. Our findings echo this sentiment to a degree but further suggest that the Bowen Technique, while effective in reducing pain (0.25 ± 0.514, $P<0.000$) after six weeks, was outperformed by MET in terms of functional improvement.

Mistey et al. (24) explored the effects of Neuromuscular Facilitation and the Active Release Technique (ART) on hamstring flexibility and pain, delivering ten sessions to participants. Their research concluded that both approaches were beneficial in reducing pain and enhancing muscle performance and activity levels, with the modified hold-relax technique showing superior efficacy in patients with low back pain. Our study's findings, after twelve sessions of MET and Bowen treatments, also reveal significant improvements in hamstring flexibility and pain reduction ($P<0.000$), adding to the evidence that manual therapies can be highly effective in managing chronic low back pain.

The strengths of this study lie in its randomized controlled design and the comparison of two distinct but popular manual therapy techniques, contributing valuable insights into their relative efficacies in treating chronic low back pain. Nevertheless, this research is not without limitations. The sample size, though adequate to detect significant differences, may not fully capture the diversity of chronic low back pain presentations in the broader population. Additionally, the study's duration was restricted to eight weeks, and longer follow-up periods may be necessary to understand the long-term impacts of these treatments.

Future research should aim to explore the mechanisms underlying the observed therapeutic effects of the MET and Bowen Technique, possibly integrating a more diverse array of outcome measures including imaging studies to assess changes in muscle and soft tissue. It would also be beneficial to evaluate these therapies in varied demographic groups and across different stages of chronic low back pain severity to ascertain their broader applicability and efficacy.

CONCLUSION

In conclusion, this study reinforces the value of MET and the Bowen Technique as effective interventions for reducing pain and improving function in individuals with chronic low back pain. While both techniques demonstrated significant benefits, MET was particularly effective in reducing functional disability, suggesting its potential as a preferred treatment modality in certain patient populations. This research contributes to the growing body of evidence supporting manual therapies in managing low back pain and highlights the need for further investigation into their comparative and combined effects.

REFERENCES

1. Balagué F, Mannion AF, Pellisé F, Cedraschi C. Non-specific low back pain. Lancet. 2012;379(9814):482-91.
2. Hoy D, March L, Brooks P, Blyth F, Woolf A, Bain C, et al. The global burden of low back pain: estimates from the Global Burden of Disease 2010 study. Ann Rheum Dis. 2014;73(6):968-74.
3. Hoy D, Brooks P, Blyth F, Buchbinder R. The epidemiology of low back pain. Best Pract Res Clin Rheumatol. 2010;24(6):769-81.
4. Shmagel A, Foley R, Ibrahim H. Epidemiology of chronic low back pain in US adults: data from the 2009–2010 National Health and Nutrition Examination Survey. Arthritis Care Res. 2016;68(11):1688-94.
5. Liang C, Li H, Tao Y, Shen C, Li F, Shi Z, et al. New hypothesis of chronic back pain: low pH promotes nerve ingrowth into damaged intervertebral disks. Acta Anaesthesiol Scand. 2013;57(3):271-7.
6. Liang C-z, Li H, Tao Y-q, Zhou X-p, Yang Z-r, Li F-c, et al. The relationship between low pH in intervertebral discs and low back pain: a systematic review. Arch Med Sci. 2012;8(6):952.
7. Hoheisel U, Mense S. Inflammation of the thoracolumbar fascia excites and sensitizes rat dorsal horn neurons. Eur J Pain. 2015;19(3):419-28.
8. Weinkauf B, Deising S, Obreja O, Hoheisel U, Mense S, Schmelz M, et al. Comparison of nerve growth factor–induced sensitization pattern in lumbar and tibial muscle and fascia. Muscle Nerve. 2015;52(2):265-72.
9. Tesarz J, Hoheisel U, Wiedenhöfer B, Mense S. Sensory innervation of the thoracolumbar fascia in rats and humans. Neuroscience. 2011;194:302-8.

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10. Azevedo DC, Van Dillen LR, Santos HdO, Oliveira DR, Ferreira PH, Costa LOP. Movement system impairment–based classification versus general exercise for chronic low back pain: Protocol of a randomized controlled trial. Phys Ther. 2015;95(9):1287-94.

11. Mistry GS, Vyas NJ, Sheth MS. Comparison of hamstrings flexibility in subjects with chronic low back pain versus normal individuals. J Clin Exp Res. 2014;2(1):85.

12. Marr M, Baker J, Lambon N, Perry J. The effects of the Bowen technique on hamstring flexibility over time: a randomised controlled trial. J Bodyw Mov Ther. 2011;15(3):281-90.

13. Waseem M, Nuhmani S, Ram C. Efficacy of Muscle Energy Technique on hamstring muscles flexibility in normal Indian collegiate males. Calicut Med J. 2009;7(2):e4.

14. Nitsure P, Kothari N. The Effectiveness Of Bowen Technique as an adjunct To Conventional Physiotherapy on Pain and Functional Outcomes in Subject with Acute Trapezitis-A Pilot Study. Rom J Phys Ther/Rev Romana de Kinetoterapie. 2015;21(36).

15. Morgan-Jones M, Knott F, Wilcox H, Ashwin C. A pilot study of fascia Bowen therapy for 8-11 year-old boys with developmental coordination disorder. J Bodyw Mov Ther. 2019;23(3):568-74.

16. Baxter DA, Shergis JL, Fazalbhoy A, Coyle ME. Muscle energy technique for chronic obstructive pulmonary disease: a systematic review. Chiropr Man Therap. 2019;27(1):1-7.

17. Cole J. A Comparison of Three Manipulative Therapy Techniques: CranioSacral Therapy, Muscle Energy Technique, and Fascial Distortion Model. University of Wyoming. Libraries; 2017.

18. Vance CG, Dailey DL, Rakel BA, Sluka KA. Using TENS for pain control: the state of the evidence. Pain Manag. 2014;4(3):197-209.

19. Ballantyne F, Fryer G, McLaughlin P . The effect of muscle energy technique on hamstring extensibility: the mechanism of altered flexibility. J Osteopath Med. 2003;6(2):59-63.

20. 20. Neto T, Jacobsohn L, Carita AI, Oliveira R. Reliability of the active-knee-extension and straight-leg-raise tests in subjects with flexibility deficits. J Sport Rehabil. 2015;24(4).

21. Boonstra AM, Preuper HRS, Reneman MF, Posthumus JB, Stewart RE. Reliability and validity of the visual analogue scale for disability in patients with chronic musculoskeletal pain. Int J Rehabil Res. 2008;31(2):165-9.

22. Koç M, Bayar B, Bayar K. A comparison of Back pain functional scale with Roland Morris disability questionnaire, Oswestry disability index, and short form 36-health survey. Spine. 2018 Jun 15;43(12):877-82.

23. Naik PP, Anand H, Khatri SM. Comparison of muscle energy technique and positional release therapy in acute low back pain–RCT. Physiother Occup Ther. 2010:32.

24. Mistry GS, Vyas NJ, Sheth MS. Comparison of the effect of Active Release Technique versus proprioceptive neuromuscular facilitation stretching (modified hold-relax) on hamstring flexibility in patients having chronic low back pain. Natl J Integr Res Med. 2015;6(5):66-70.