EFFECTS OF MUSCLE ENERGY TECHNIQUE ON QUADRATUS LUMBORUM AND ACTIVE POSTERIOR PELVIC TILT EXERCISES ON PAIN AND DISABILITY IN ACUTE LOW BACK PAIN SUBJECTS - A COMPARATIVE STUDY

Dr. Vijaya Senthil Kumar*, Dr. Franklin Shaju M.K, Dr. Senthil Kumar*** & Dr. A. Velmurugan******

**Research Scholar, Himalayan University, Itanagar, Arunachal Pradesh, India.*
***Professor, RVS College of Physiotherapy, Tamil Nadu, India.*
****Research Scholar, Himalayan University, Itanagar, Arunachal Pradesh, India.*
*****Professor, St. John's College of Nursing, Kattappana, Kerala, India.*

DOI: http://doi.org/10.47211/idcij.2020.v07i04.007

ABSTRACT

Background of the study: Acute low back pain is the commonest problem human body suffers with second to common cold. Back pain leads to loss time from work. Loss of productivity, health care costs, financial compensation and various psycho social problems. Muscle energy technique is a system of manual therapy for treatment of movement impairment that combines the precision of passive mobilization. Pelvic tilting exercises in the sagittal plane are generally used to correct the alignment of the lumbar spine of patients with lower back pain. A posture that reinforces lumbar lordosis was identified as one of the main causes of low back pain.

Objective of the study: The objective of the study is to find and compare the effects of muscle energy technique on quadratus lumborum and active posterior pelvic tilt exercises on pain and disability in acute low back pain patients.

Methodology: Twenty clinically diagnosed acute low back pain patients were selected based on the inclusion and exclusion criteria. They were randomly allocated into two groups (Group A and Group B) consists of 10 subjects each. Group A received muscle energy technique on quadratus lumborum and group B received active posterior pelvic tilt exercises. Intervention lasted for 5 days and 30 minutes per day. Pain and disability were measured before and after 5 days of intervention by visual analog scale and oswestry disability index respectively.

Conclusion: Both muscle energy technique on quadratus lumborum and active posterior pelvic tilt exercises reduced pain and disability in acute low back pain patients. When comparing both muscles energy technique on quadratus lumborum is more effective than active posterior pelvic tilt exercises in reducing pain and disability among acute low back pain patients.

Keywords: *Acute low back pain, Muscle energy technique, Posterior pelvic tilt exercises, Pain Disability.*

ABOUT AUTHORS:

Dr. Vijaya Senthil Kumar is Senior Sports & Musculoskeletal rehab specialist. She is a former senior lecturer and consultant physiotherapist in the field of physiotherapy since 24 years, having wide knowledge in treating sports and musculoskeletal injuries.

Dr. Franklin is professional Physiotherapist with more than twenty years of experience, deployed in various fields of Physical therapy. He is exposed in research, clinical therapy as well as hands on expertise in classroom grooming as a faculty member. He is the member of Indian Association of Physiotherapists. Currently, he holds the position of Professor, RVS College of Physiotherapy, Coimbatore, Tamil Nadu, India.

Dr. Senthil Kumar is a former senior lecturer and consultant physiotherapist in the field of physiotherapy since 24 years, having wide knowledge in neuro rehabilitation as a specialty. He is Senior Neuro – Rehab specialist.

Prof. (Dr.) A. Velmurugan is Ph.D. in Nursing. He began his profession as a clinical instructor, Assistant professor, Associate professor and professor in college of Nursing. He is Head, Department of Medical & Surgical Nursing, St. John's College of Nursing, Kattappana, Kerala, India.

INTRODUCTION

Acute low back pain is the commonest problem human body suffers with second to common cold. Back pain leads to loss time from work. Loss of productivity, health care costs, financial compensation and various psycho social problems. Low back pain occurs with vide variety of professions including those involving heavy labor, repetitive work activities, and extended sedentary postures[1].

Muscle energy technique is a system of manual therapy for the treatment of movement impairment that combines the precision of passive mobilization. The therapist localizes and controls procedure while the patient provides corrective forces and energies for treatment as instructed by the therapist, it is an active technique[2]. Both anterior and posterior pelvic tilt tent to be a result of a combination of biomechanics and habits. In biomechanics of posterior pelvic tilt, to a great extent, it will likely revolve around two things, where the hip bones are relative to the plumb line. The second aspect of posterior pelvic tilt biomechanics is about how tight your hamstrings are. The biomechanics refers how living beings are structured and how they move mechanically[3].

The purpose of the study is to find and compare the effects of muscle energy technique on quadratus lumborum and active posterior pelvic tilt exercises on pain and disability in acute low back pain patients.

METHODOLOGY

Review Board of Lakshmi Physiotherapy clinic, Coimbatore has approved this two group pre and post-test experimental study and a written consent was obtained from the participants after giving clear instructions regarding the treatment procedure and its implications.

Twenty clinically diagnosed acute low back pain patients age between 25 to 35 were selected consecutively for the study and randomly assigned into anyone of the two experimental groups. Group A ten subjects received muscle energy technique on quardatus lumborum. In side lying subjects were asked to extend the upper most arm over the head to firmly grasp the top end of the table and abducts the uppermost leg until the therapist palpates strong quardatus lumborum activity. The patient holds the leg isometrically in this manner, allowing gravity to provide resistance. After 5 seconds contraction the patient allows the leg to hang slightly behind him. This action is repeated alternately with raised leg in front and behind the trunk for 6 times on each side. The therapist cradles the pelvis with both hands by passively moving to a new restricted barrier without stretch along the direction of the long axis of abducted leg after ensuring patient has completely relaxed for 5 seconds[4]. Group B ten subjects received active posterior pelvic tilt exercises, in supine lying position subjects were asked to bring the posterior superior iliac spine of pelvis posteriorly and inferiorly, thus closer to the posterior aspect of the femur as the pelvis rotates backward around the axis of hip joints resulting in hip extension and lumbar spine flexion. When hip

extension is the desired motion, the lumbar extensors contract to stabilize the pelvis[5]. Both the interventions lasted for thirty minutes per day, and the same was continued for 5 days.

Pain and disability were measured before and after 5 days of intervention by visual analog scale and oswestry disability index respectively. All extraneous variables were clearly identified and ruled out from the study.

DATA ANALYSIS AND RESULTS

The study aims to find and compare the effects of muscle energy technique on quadratus lumborum and active posterior pelvic tilt exercises on pain and disability in acute low back pain patients.

Table 1: Mean value, mean difference and paired 't' value of pain among group A and B subjects

Pain	Pre test Mean	Post test Mean	Mean Difference	Standard Deviation	Paired 't' Value
Group A	6.3	4	2.3	0.67	10.85*
Group B	6.3	5	1.3	0.483	8.56*

0.005 level of significance

In group A for pain the calculated paired 't' value is 10.85 and the 't' table value is 3.250 at 0.005 level. Since the calculated 't' value is more than the 't' table value, there is significant difference between pre and post test scores of pain following muscle energy technique on quadratus lumborum among acute low back pain patients.

In group B for pain the calculated paired 't' value is 8.56 and the 't' table value is 3.25 at 0.005 level. Since the calculated 't' value is more than the 't' table value, there is significant difference between pre and post test scores of pain following active posterior pelvic tilt exercises among acute low back pain patients.

Table 2: Mean value, mean difference and paired 't' value of disability among group A and B subjects

Disability	Pre test Mean	Post test Mean	Mean Difference	Standard Deviation	Paired 't' Value
Group A	32.8	29.6	3.2	0.786	12.87*
Group B	34.6	32.5	2.1	0.632	10.9*

0.005 level of significance

In group A for disability the calculated paired 't' value is 12.87 and the 't' table value is 3.250 at 0.005 level. Since the calculated 't' value is more than the 't' table value, there is significant difference between pre and post test scores of disability following muscle energy technique on quadratus lumborum among acute low back pain patients.

In group B for disability the calculated paired 't' value is 10.9 and the 't' table value is 3.25 at 0.005 level. Since the calculated 't' value is more than the 't' table value, there is significant difference between pre and post test scores of disability following active posterior pelvic tilt exercises among acute low back pain patients.

Table 3: Mean value, mean difference and un paired 't' value of pain and disability among group A and B subjects

Variable	Group A Mean	Group B Mean	Mean Difference	Standard Deviation	Un Paired 't' Value
Pain	2.3	1.3	1	0.586	3.84*
Disability	3.2	2.1	1.1	0.71	3.28*

0.005 level of significance

In between group analysis the calculated unpaired't' values for pain and disability were 3.84 and 3.28 respectively and the 't' table value is 2.878 at 0.005 level. Since the calculated 't' values are more than the 't' table value there is significant difference between muscle energy technique on quadratus lumborum and active posterior pelvic tilt exercises in improving pain and disability in acute low back pain patients.

When comparing the mean values of both the groups, group A subjects treated with muscle energy technique on quadratus lumborum showed more difference in both pain and disability scores than group A subjects treated with active posterior pelvic tilt exercises.

DISCUSSION

The results of the present study shows that both muscle energy technique on quadratus lumborum and active posterior pelvic tilt exercises reduced pain and disability in acute low back pain patients. When comparing both muscle energy techniques on quadratus lumborum had more effect than active posterior pelvic tilt exercises in reducing pain and disability among acute low back pain patients.

The positive effects by muscle energy techniques was either by post-isometric relaxation affecting the tissues that had just been contracted isometrically, or reciprocal inhibition, affecting the antagonists to the tissue that has contracted post-isometric relaxation and reciprocal inhibition[6]. In active posterior pelvic tilt exercises, avoid the spine from excessive stress or strain. Learning how to maintain a neutral spinal alignment will also help to stabilize the spine during everyday activities such as walking, sitting and lifting[7].

CONCLUSION

Both muscle energy technique on quadratus lumborum and active posterior pelvic tilt exercises reduced pain and disability in acute low back pain patients. When comparing both muscles energy technique on quadratus lumborum is more effective than active posterior pelvic tilt exercises in reducing pain and disability among acute low back pain patients.

REFERENCES

1. Bhojan Kannabiran, J Divya J Pawani and Ramaswamy Nagarani (2015). A Comparative Study of the Effectiveness of Two Manual Therapy Techniques on Pain and Lumbar Range of Motion in Individuals with Mechanical Low Back Ache. *EC Orthopedics 2.1: 36-42.*
2. Richa Kashyap, Amir Iqbal, and Ahmad H Alghadir (2018). Controlled intervention to compare the efficacies of manual pressure release and the muscle energy technique for treating mechanical neck pain due to upper trapezius trigger points. *Journal of Pain Research11: 3151–3160.*
3. Sho Takaki, MS, PT, Koji Kaneoka, PhD, MD, Yu Okubo, PhD, PT, Satoru Otsuka, MS, Masaki Tatsumura, PhD, MD, Itsuo Shiina, PhD, MD, and Shumpei Miyakawa, PhD, MD (2016). Analysis of muscle activity during active pelvic tilting in sagittal plane. *Physical Therapy Research19 (1): 50–57.*
4. Patil Prachi N, Chandu Basavaraj, metgud Santhosh, Khatri Subhash (2010), effectiveness of muscle energy technique on quadratus lumborum in acute low back pain - randomized controlled trial. *Indian journal of Physiotherapy and Occupational therapy; Volume: 4 issue 1.*
5. A Vleeming, M D Schuenke, A T Masi, J E Carreiro, L Danneels, and F H Willard (2012). The sacroiliac joint: an overview of its anatomy, function and potential clinical implications. *Journal of Anatomy, 221(6): 537–567.*
6. Aggarwal Sonal S (2016). Comparison between post isometric relaxation and reciprocal inhibition manuevers on hamstring flexibility in young healthy adults: randomized clinical trial. International Journal of Medical Research & Health Sciences; 10.5958/2319-5886.2016.00008.4
7. Rebecca Gordon and Saul Bloxham (2016).A Systematic Review of the Effects of Exercise and Physical Activity on Non-Specific Chronic Low Back Pain. Healthcare 4(2): 22.