

RESEARCH REPORT**EFFECTS OF TENSOR FACIA LATAE MUSCLE RELEASE ON BACK PAIN****ABSTRACT****BACKGROUND AND AIM**

Most of the developed countries in the world are facing a major health problem of lower back pain (LBP). According to a survey conducted by NHIS in the year 2002 on the British general population, 38% adults reported low back pain in one year. Hence the present study aims to identify which type of physical therapy intervention is effective in relieving back pain.

STUDY DESIGN

Randomized Control Trial

METHODOLOGY

All subjects were assessed using assessment Performa. Pain intensity will be assessed using (VAS 0-10). VAS is reliable and valid model for measurement of pain.

RESULTS

Study revealed that the pain of the patient was not significantly reduced in both the group with $P < 0.21$ for Group A and $P < 0.399$ for Group B. However on Oswestry disability Index, Group A shows significant improvement with $P < 0.21$ whereas Group B with $P < 0.399$ has no significance.

CONCLUSION

The study concluded that both treatment strategies were turned out to be equally effective in improving the pain and disability of the patient with back pain and no statistical and clinical significance has been reported to conclude that which one is more effective than the other.

KEYWORDS

Low Back Pain (LBP), Visual Analogue Scale (VAS), Oswestry Disability Index (ODI), Ischemic Compression, Cryotherapy, Tensor Fascia Latae

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[Ismail S, Malik S, Huda A, Roopeta P. Effects of tensor facia latae muscle release on back pain. Pak. j. rehabil. 2017;6(2):20-25]

INTRODUCTION

Most of the developed countries in the world are facing a major health problem of lower back pain. The term lower back pain is very wide and a large group of heterogeneous disorders of back are covered into this domain¹. The pathology is found mainly in the discs and the vertebral joints of lumbar spine which are the main source of lower back pain in degenerative diseases of the vertebral region and sciatica which may cause due to ruptures in the posterior part of the annulus². The occurrence of back pain rises from third decade of life till sixty years of age where women are more prone to develop this condition. A systemic review was conducted which includes 28 studies, provided evidences that the occurrence is 4.2% in individuals between 24 and 39 year old and 19.6% in between 20 and 59 aged total prevalence in Brazilian older population was observed 25.4%³.

Western world is also suffering from major back pain problems estimated that 60% to 90% is the life time prevalence whereas 15% to 42% is the point prevalence; approximately 5% is the annual incidence of back pain reported in 2002. According to NHIS out of a general population of 31,044 adult respondents, 26.4% of respondents had at least low back pain lasting for a whole day in the past 3 months, 13.8% neck pain was reported. Asian Americans had the lowest prevalence of low back pain as compare to American Indians and Alaska Natives. According to another survey conducted by NHIS in the year 2002 on the British general population, 38% adults reported low back pain in one year and one third of them suffered from the back pain for more than four week during the periods of two decades thus soaring the prevalence disability due to low back pain exponentially among the Britain population.

Researches also provided a significant evidence of having a causal relationship between the age and the occurrence of back pain⁴, other factors may include disc degeneration, herniaion of the disc, and osteoarthritis of the zygapophyseal joints, fractures of pars interarticularis, spondylolisthesis, ligamentous injury, trigger points of paravertebral and gluteus muscle⁵. 95% of low back pain caused in the natural population due to anxiety disorders whereas 54% of patients pain with depression. It is difficult to avoid these observations that most patients are completely recovered within a month in primary care centers Age, educational status, job satisfaction, psycho social factors, occupational factors and obesity are the factors that play an important role in the development of back pain. Associated symptoms in the lower limbs with low back pain results in disability⁶. Financial burden because of back pain in the United States both direct and indirect costs around \$84.1 billion to \$624.8 billion⁷. Conservative treatment such as phys-

ical therapy is the first choice of treatment for acute low back pain. Recommendations for rest, medication block injection and exercises are also performed by a physical therapist and strengthening exercises and stretching of different muscles such as hamstring and tensor fascia muscle⁸. Evidence suggests that a program activity based on grades system improves outcomes in sub-acute in low back pain whereas there is unclear evidence for other types of exercise .Exercise therapy is very useful as either no treatment or other conservative treatments in acute low back pain. Physical therapy, the conservative treatment is the first choice of treatment for acute low back pain. Recommendations for rest, medication block injection and Williams exercises are also performed by a physical therapist and Strengthening exercises and stretching of different muscles such as hamstring and tensor fascia muscle are very effective in back muscle for relieving pain .

By stretching the tensor fascia latae muscle expansions of the capillaries which increase the blood supply thus reducing the metabolites and providing sufficient oxygen to the muscle cell reduced pain and improve range of motion⁹. There is need to explore the effectiveness of tensor fascia latae release in low back pain because there is no study done in Pakistan.

This study was conducted in Physiotherapy Department of Inje University, Korea in 2017 about Tensor fascia latae (TFL) muscle increases the pelvis and hip range of motion and it reported to decrease the back pain. Thus the reason of this research was to investigate the effects of static stretching using a load on TFL muscle in patients with back pain¹⁰.

A study conducted in Rehabilitation Support Research Institute in Japan. They studied that the chronic lower back pain patients who have no neurological sign and symptoms in the lower extremity, performing DS of the TFLM and hamstrings can result in an instant good development of posture and gait. This study assumes that the degree of tension on the TFLM may indirectly effect the muscle tension of the muscle groups that surround the thigh. TFLM had an instant result on acute back pain. DS of the TFLM not only has an instant result on acute, non-specific back pain, but also has durable long lasting results¹¹.

Gottschalk FR studied different patient with lower back pain, whereas, an experimental group and control group was measured through VAS and he concluded that the trial group showed major change in VAS. Hence static stretching using a load can be actively utilized for back pain patients with shortened Tensor fascia latae muscle¹².

A study was conducted in Department of Physical Therapy, Yonsei University, Wonju, South Korea. A

previous study demonstrated that use of a pressure biofeedback unit (Chattanooga Group, Inc, Hixson, TN) during SHA could decrease quadratus lumborum activity and increase Gluteus medius activity. However, there is no reported method to avoid excessive TFL muscle activity. When the TFL is activated to compensate for a weak Gluteus medius, the TFL may become dominant, compared with the Gluteus medius, from repeated use. A dominant TFL can contribute to pain in the hips, in the lower back¹³.

In the existing clinical practices to select the best favorable intervention for low back pain, there are no clear evidence-based guidelines suggested for the health practitioners as what intervention is more beneficial for the management of low back pain. Only on a weak base tensor fascia muscle release in lower back pain is preferred. A randomized controlled trial was conducted to evaluate the effectiveness of hip abductors including tensor fascia latae muscle release on back pain and improve evidence of physical therapy practice in Pakistan.

METHODOLOGY

All subjects was assessed by the senior physical therapist and trigger point was released by giving ischemic compression for 90 seconds, after ischemic compression stretch was applied to the muscle for 2 minutes and 5 minutes cryotherapy was given at the end. Back pain was assessed by using VAS scale before and after treatment. Each patient received three treatment sessions per week.

Study Design

Randomized Controlled Trial

Sample Size

A sample size of 80 was calculated using a prevalence of back pain from study conducted at Lahore Pakistan Titled as "Prevalence and Risk Factors of Low Back Pain Among the Office Workers of King Edward Medical University Lahore, Pakistan"

Data Collection

The procedure of lower back pain was briefly described to the concerned patients and a written consent was taken from them for research purpose. All subjects were assessed using assessment Performance. Pain intensity was assessed using (VAS 0-10). VAS is reliable and valid model for measurement of pain.

Study Setting

- Physiotherapy Department, Tertiary care Hospital.

Data analysis

To analyze the qualitative data SPSS 21 version was used to calculate the variables. Moreover,

Non-parametric tests were used to find out the differences between control group and case study group.

Sampling Techniques

- Simple random sampling.

The data was collected through sampling technique which divided the sample size into two groups randomly by software and that was marked by "0" as a control group and "1" as a case group. Furthermore, the control group received tensor fascia exercise. Whereas, the case group didn't receive tensor fascia exercises but was given other back exercises for collecting the data.

Study Duration

3 months.

Inclusion Criteria

- Both males and females patients.
- Patient having back pain in this study.
- Patient is active walk without assistive device¹⁴.

Exclusion Criteria

- Diabetes mellitus,
- Hypertension,
- Dementia or cognitive impairment,
- Neurological disorder,
- Permanent lower-limb sensory loss¹⁴.

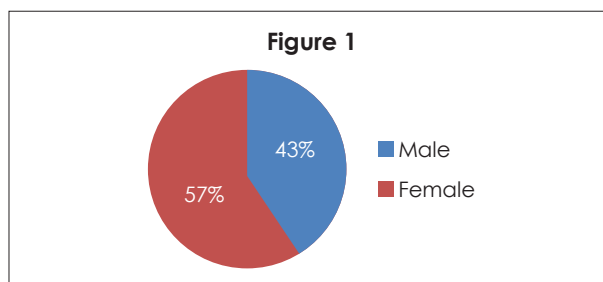
Ethical Consideration

Data kept secret and was secured.

All information of study must be secret in computer software. All information kept confidential. Every patient has right to quite the research at any time. No harmful effects of this research to the patient. Every patient was treated equally in this research.

RESULTS

Total 80 patients were evaluated to determine the pre-and post-treatment on Visual Analog Scale and ODI score for related symptoms in tertiary care hospital. They all are randomized enrolled and divided into two groups. Total 38 patients were male and 42 female patients with the mean age of 32.08 \pm SD 8.22 (range 21-60 years) were enrolled. Gender distribution of the patient is shown in figure 1



All patients out of 80 were present to be reevaluated after the treatment session. 40 patients in the first group that was General treatment and 40 patients in the second group that was Tensor fascia latae release technique. All the participants in group A and in group B were examined before the treatment and after the treatment sessions at physiotherapy department under the supervision of physiotherapist. The pre and the post treatment effect on VAS and ODI is shown in figure 2 and 3 respectively.

Figure 2

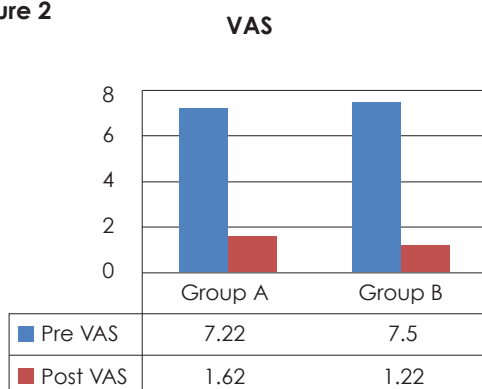
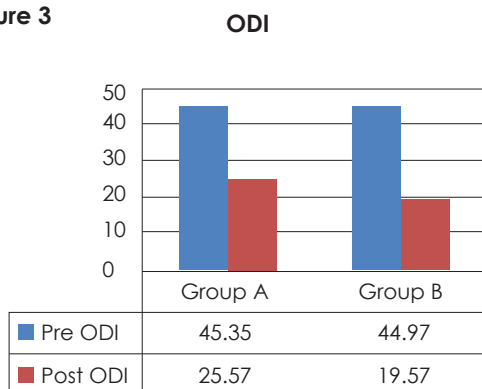


Figure 3



The result obtained from the study revealed that the pain of the patient was not significantly reduced in both the group with $P < 0.205$ for group A and $P < 0.399$ for group B. However on Oswestry disability Index, group A shows a significant improvement $P < 0.205$ whereas for group B no such significant result has been obtained $P < 0.399$. It was however also noted while comparing both the group the post treatment mean value for pain on Visual Analog Scale and disability index value on Oswestry disability index is improved in Group B patient. The improvement noticed in group B patient can be called a statistical improvement on the mean values obtained after the treatment as shown in figure 2 and 3 however the clinical outcome of both the treatment strategies was more or less equal.

DISCUSSION

Low back pain is seriously frequent health problem and a main cause of disability that affects work performances and well-being¹⁵. A randomized controlled trial was conducted to evaluate the effect of tensor fascia latae muscle release and muscle exercises along with electrophysical agents in the treatment of low back pain. The study includes 80 patients who were diagnosed with low back pain including males and females without any serious pathology and contraindication.

In this study participant from both genders were selected. It was found to have higher ratio of male participants than female. Similarly in a systemic review, Buchbinder and colleagues confirmed that females suffered more than male¹⁶. However in the other study hoy d et al in 2014, the lower back pain is more common in males than females¹⁷.

The age group from 21 to 60 years was included in this study keeping in view some recent studies such Bulletin August 2016 states that as people aged 65–74 are more prone to develop back pain¹⁸.

In this study Oswestry low back pain disability questionnaire was used for the measurement of back pain where in the recent studies o. Hägg and colleagues states that the general function score, the Zung depression scale as well as Oswestry low back pain disability questionnaire used to the measuring of back pain because of its good validity and reliability¹⁹.

In this current study subjects treated in both groups showed decreased in ODI at the end of treatment sessions whereas the experimental group (tensor fascia latae release on back pain) showed more decrease in ODI score as compared to control group (back strengthening exercises) it is supported by conclusion of Ulin A and colleagues conducted a study in 2013 which revealed that weak hip abductor muscles reduce the movement of the hip joint due to restricted hip movement can cause knee, hip, and back pain strengthening of the hip abductors especially tensor fascia latae muscle help in reducing the back pain²⁰.

Current study subjects treated in both groups showed decreased in ODI at the end of treatment sessions whereas the experimental group (tensor fascia latae release on back pain) showed more decrease in ODI score as compared to control group (back strengthening exercises). no evidence is present studies regarding comparison between these two techniques but the findings of present study reduction in pain level, as quantified by ODI, but the evidence regarding the importance of tensor fascia latae shows significant pain relief and help in better walking pattern as in Gottschalk Frand et al conducted a study in which the tensor

fasciae latae muscle has the most important purpose of balancing the weight of the body and the non-weight-bearing leg during walking because of tensor fascia latae muscle provide the spinal stability and provide the greater relief of back pain¹².

In the present study tensor fascia latae muscle release on back pain superior over the group of back strengthening exercises because there is strong relation of tensor fascia latae muscle and the fatigue of back pain as the study conducted by Viggiani and colleagues state that the interaction between low back pain developed from prolonged standing and fatigue of the hip abductors muscle group especially tensor fascia latae muscle. In this study 40 patients included 20 male and 20 females. Study proves that tensor fascia latae muscle release is very effective to maintain the prolonged standing and help in relieving back pain²¹⁻²⁵.

CONCLUSION

The study concluded that the both treatment strategies were turned out to be equally effective in improving the pain and disability of the patient with back pain and no statistical and clinical significance has been reported to conclude that which one is more effective of the other. However it was noted from the study that the technique of release of the tensor fascia latae muscle is found to slightly more effective in relieving back pain in compare to the general physical therapy approach.

REFERENCES

- [1] Dario AB, Ferreira ML, Refshauge KM, Lima TS, Ordoñana JR, Ferreira PH. The relationship between obesity, low back pain, and lumbar disc degeneration when genetics and the environment are considered: a systematic review of twin studies. *Spine J.* 2015 May 1;15(5):1106-17
- [2] Meucci RD, Fassa AG, Faria NM. Prevalence of chronic low back pain: systematic review. *Revista de saude publica.* 2015;49
- [3] Vermani E, Mittal R, Weeks A. Pelvic girdle pain and low back pain in pregnancy: a review. *Pain Pract.* 2010;10(1):60-71
- [4] Mounds PS. Effects of a spinal segmental stabilization program, on the anticipatory postural adjustment, in women with chronic non-specific low back pain-randomized control [Doctoral Dissertation]. 2016
- [5] Lionel AK. Risk factors for chronic low back pain. *J Community Med Health Educ.* 2014;4(271):2161-2171
- [6] Sagheer MA, Khan MF, Sharif S. Association between chronic low back pain, anxiety and depression in patients at a tertiary care centre. *J Pak Med Assoc.* 2013;63(6):688-90
- [7] Gore M, Sadosky A, Stacey BR, Tai KS, Leslie D. The burden of chronic low back pain: clinical comorbidities, treatment patterns, and health care costs in usual care settings. *Spine.* 2012;37(11):668-677
- [8] Williams BS, Cohen SP. Greater trochanteric pain syndrome: a review of anatomy, diagnosis and treatment. *Anesth Analg.* 2009;108(5):1662-70
- [9] Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Erö J, Fabjan C, Friedl M, Frühwirth R. Search for the standard model Higgs boson produced in association with a W or a Z boson and decaying to bottom quarks. *Phys. Rev. D.* 2014;89(1)
- [10] Bae HI, Kim DY, Sung YH. Effects of a static stretch using a load on low back pain patients with shortened tensor fascia lata. *J Exerc Rehabil.* 2017 ;13(2):227
- [11] Ohtsuki K. A 3-month Follow-up Study of the Long-term Effects of Direct Stretching of the Tensor Fasciae Latae Muscle in Patients with Acute Lumbago Using a Single-case Design. *J Phys Ther Sci.* 2014;26(5):755-8
- [12] Gottschalk FR, Kourosh SO, Leveau B. The functional anatomy of tensor fasciae latae and gluteus medius and minimus. *J Anat.* 1989;166:179
- [13] Cooper NA, Scavo KM, Strickland KJ, Tipayamongkol N, Nicholson JD, Bewyer DC, Sluka KA. Prevalence of gluteus medius weakness in people with chronic low back pain compared to healthy controls. *Eur Spine J.* 2016;25(4):1258-65
- [14] Hayden JA, Van Tulder MW, Malmivaara AV, Koes BW. Meta-analysis: exercise therapy for nonspecific low back pain. *Annals of internal medicine.* 2005;142(9):765-75
- [15] Luoma K, Riihimäki H, Luukkonen R, Raininko R, Viikari-Juntura E, Lamminen A. Low back pain in relation to lumbar disc degeneration. *Spine.* 2000;25(4):487-92
- [16] 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; 73:968-74
- [17] Koley S, Kaur J, Sandhu JS. Biological Risk Indicators for Non-specific Low Back Pain in Young Adults of Amritsar, Punjab, India. *J Life Sci.* 2010;2(1):43-8
- [18] Wong AY, Samartzis D, Karppinen J. Low back pain in older adults: risk factors, management options and future directions. *Scoliosis Spinal Disord.* 2017;12(1):14
- [19] Hägg O, Fritzell P, Nordwall A. The clinical importance of changes in outcome scores after treatment for chronic low back pain. *Eur Spine J.* 2003;12(1):12-20
- [20] Ulin A, Draper K, Draper K. Strengthening Your Hip Muscles: Some Exercises May Be Better Than

- Others. Celebration of Undergraduate Scholarship. Celebration of Undergraduate Scholarship. 2014
- [21] Al-Hayani A. The functional anatomy of hip abductors. *Folia Morphol.* 2009; 68(2):98-103
- [22] Viggiani D. The Effects of Hip Abductor Fatigue on Low Back Pain Development during Prolonged Standing. MSc [dissertation]. Canada: University of Waterloo; 2015. Available from: https://uwspace.uwaterloo.ca/bitstream/handle/10012/9525/Viggiani_Daniel.pdf;sequence=3
- [23] Cashaback JG, Cluff T. Increase in joint stability at the expense of energy efficiency correlates with force variability during a fatiguing task. *J Biomech.* 2015;48(4):621-6
- [24] Howarth SJ, Callaghan JP. The rule of 1s for padding kinematic data prior to digital filtering: Influence of sampling and filter cutoff frequencies. *J Electromyogr Kinesiol.* 2009;19(5): 875-81
- [25] Nelson-Wong E, Howarth SJ, Callaghan JP. Acute biomechanical responses to a prolonged standing exposure in a simulated occupational setting. *Ergonomics.* 2010;53(9):1117-28
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