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COMPARISON OF TWO INTERVENTIONS: MUSCLE ENERGY TECHNIQUES AND ROUTINE PHYSICAL THERAPY FOR NONSPECIFIC LOW BACK PAIN- A REVIEW ARTICLE

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Abstract:

Muscle energy technique (MET) is used by many professions which are relevant to manual therapy. Bountiful objectives of this technique which are claimed to be efficacious are such as lengthening of contracted or shortened muscle, strengthening of weakened muscles and increasing the joint range of motion (ROM). Although research and clinical experience have shown that treatment of Hamstring flexibility is important, there is no widely acceptable form of treatment that is agreed upon to successfully improve the flexibility of hamstrings which may indirectly affect the back region. Post-isometric muscle relaxation and static stretch with stabilizing exercises led to increase in flexibility of hamstring and trunk forward bend in healthy people. Common disorder is low back pain that involves the muscles, nerves or bone of back. Pain may be of three types depending upon duration of pain that is acute, subacute or chronic. Muscle energy techniques and static passive stretching, both were effective in improving the hamstring flexibility and had better effect on improving hamstring flexibility in patients of non-specific low back pain. The use of METs and Static stretching Exercise for the improvement in health-related quality of life, pain and Range of Motion can be a useful approach.

Keywords: *Muscle energy techniques, routine exercises, Muscle Energy Techniques, low back pain, Pain, Quality of Life , Hamstring flexibility*

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INTRODUCTION:

Osteopaths developed a manual technique named as Muscle energy technique (MET) which is used by many professions which are relevant to manual therapy. Bountiful objectives of this technique which are claimed to be efficacious are such as lengthening of contracted or shortened muscle, strengthening of weakened muscles, increasing the joint range of motion (ROM) and to aid the blood or fluid drainage acting as a lymphatic or venous pump.[1] There is limited research data that is supporting and authenticating the use of Muscle energy techniques and lacking the evidence justifying the theories illustrating the effects of MET's, although these are extensively used by osteopaths and other manual therapists as well. Different researchers have investigated the outcomes of contract-relax techniques on flexibility of hamstrings which are similar to MET, and commenced that these techniques have increased muscle extensibility.[2,3] Handel et al [4] devised contract-relax exercise plan and analyzed that there is momentous increases in hamstring flexibility as well as increment in passive torque (force that is used to stretch the hamstring).Muscle energy techniques is the hands-on or manual therapy used by the physical therapists , physicians or by some chiropractors . In this therapy the therapist provide resistance to the patient and patient contracts the muscles pushing them against the resistance by therapist. The physiotherapist meanwhile assists patient in the stretching, relaxing and that of strengthening of that muscle. The goal of this technique is to increase the joint mobility or to restore the normal muscle. Several factors are available linked with chronic LBP including posture long standing hours [4], structural changes or nonstructural factors like scoliosis [5] ,one of them is the hamstring flexibility, the reduction in which can be a stimulus for nonspecific low back pain. Low back pain affects almost all of the individuals once in their life and almost forty percent are affected by it. It can be acute or chronic with acute pain remaining for less than six weeks and chronic pain longer than twelve weeks. [6] The consistent element of muscle flexibility in the passive stretch is better presumed than the therapeutic effect of MET. Myofibrils mainly took up the resting tension produced in skeletal muscle fibers and on the other side, the viscoelastic constituents of the connective tissues responsible for the "creep" and "stress relaxation" behavior of muscle[7]. Elongation of muscle to its endurance and continuing the situation for a period of time is known as static stretching [8]. Static stretch is a technique in which the muscle is slowly elongated in a position of tolerance and then held. This method requires less energy to execute and lessen the soreness. There is little or no research data exploring the time required for a sustained stretch. According to Behm et al[9] ,thirty seconds once per day is maximum time required for a stretch to hold. Slow stretching techniques manifested having beneficial effects. According to Fasen JM et al[10], static stretching supposed to be the protected and most successive method of stretching along with the minimal risk of injury .Although research and clinical experience have shown that treatment of Hamstring flexibility is important, there is no widely acceptable form of treatment that is agreed upon to successfully improve the flexibility of hamstrings which may indirectly affect the back region. Both the methods work on different physiological principles to increase the HF. relaxation" behavior of muscle[7]. Elongation of muscle to its endurance and continuing the situation for a period of time is known as static stretching [8].There is limited research data that is supporting and authenticating the use of Muscle energy techniques and lacking the evidence justifying the theories illustrating the effects of MET's, although these are extensively used by osteopaths and other manual therapists as well. The flexibility of muscles determines the ability of an individual to perform safe and optimal physical activity[6]. Although research and clinical experience have shown that treatment of Hamstring flexibility is important, there is no widely acceptable form of treatment that is agreed upon to successfully improve the flexibility of hamstrings which may indirectly affect the back region. Both the methods work on different physiological principles to increase the HF. Besides this, there are no studies done comparing the effect of METS and Passive static stretch on hamstring flexibility for patients having constant back pain and their effect on improvement of low back pain. Hence there is a need for the study to find which technique is better for improving HF in chronic LBP patients. METS is an advanced stretching technique. Medeleine smith researched two different types of (MET) that have been supported by different past literature. These contrast in stretch phase just after the stage of contraction. Group A applied muscle energy technique with 30 second post isometric stretch phase while group B received Muscle energy technique with 3 second post isometric stretch phase. Result showed both techniques proved equally effective for improving hamstring extensibility. After the initial treatment persistent improvement was produced in one week. The conclusion drawn was that there was no change in muscle extensibility by increasing the MET for short term. [11]

MUSCLE ENERGY TECHNIQUES EFFECTS

Roshan assessed using the sit and reach test. It was concluded that MET improved the flexibility of hamstrings and enhanced their performance.[12] Gohil (2013) conducted a study to associate the effect of efficacy of muscle energy technique and static passive stretching on hamstring. 30 college athletes with hams tightness were randomly allocated. Both groups received

MET and static stretching respectively. After the treatment of one day both groups were assessed by measuring the angle by goniometer while performing SLR. the results showed that muscle energy techniques were more effective than static stretching in improving hamstrings flexibility.[13] Madeleine smith performed a study in 2008; he shows the changes in the application of muscle energy techniques. Muscle energy techniques basically applied to increase the extensibility of muscles. This study is performed to explore the difference of two types of muscle energy techniques that is basically differ in the duration of stretch phase which is given after contraction. In this study two techniques are applied 1 is 30sec post isometric stretch and other is 3 sec isometric stretch. and results show both techniques are equally reliable to increase flexibility of hamstrings.[11] Chaitow explained muscle energy techniques as revolt in the field of manipulative therapy.in this study researcher explains previous osteopathic technique that us used is specifically involve the relaxation of soft tissues , after more advancement in 20th century the techniques are introduced which involves soft tissue mobilization with joint mobilization. the main objective of muscle energy techniques is it encourages the relaxation to the hypertonic muscle.[14] Fryer et al.in stated that muscle energy techniques are the evidence based technique used for the mobilization of soft tissues. This technique can also be used for the diagnostic purpose. Muscle energy techniques are used for various purposes i.e. restricted joint movement, weak muscle, decrease in length of muscles. Muscle energy techniques are also used to improve lymphatic drainage.[15]

STATIC STRETCHING EXERCISE AND HAMSTRING FLEXIBILITY

Emad et al used stretching exercise to increase flexibility in patients with hamstrings contracture. It was concluded from this study that MET is more effective than static stretching alone in improving hamstring muscle flexibility.[16] Dariusz et al, concluded that Post-isometric muscle relaxation and static stretch with stabilizing exercises led to increase in flexibility of hamstring and trunk forward bend in healthy children. Common disorder is low back pain that involves the muscles, nerves or bone of back. Pain may be of three types depending upon duration of pain that is acute (pain less than or 6 weeks), sub chronic (pain of 6 to 12 weeks) chronic (pain more than 12 week) Further classifying pain it also depend upon the underlying cause that may be mechanical, non-mechanical or referred pain. The symptoms may improve within few weeks after the starting of the pain. 40 to 90 % get better within six weeks. If NSAID'S are not effective initially we recommend the non-pharmacologically treatment. Pain free range activity should be recommended and performed to increase range of motion or to decrease the pain for better results. Many other treatments may give to patient to decrease the pain. Opioids are alone generally not given to patient due to their adverse effects Low back pain may also affect the mood that may be improve by the antidepressants or other therapies. Chiropractic care is also beneficial Spinal stabilization can also be effective [17]. WD supported that 30 sec time duration is effective to withstand a hamstring muscle in stretched condition, in order to achieve complete range of motion. No improvement in the flexibility was detected by either increasing the duration or frequency of stretch.[18] Paul W.M Marshall ,result indicated that hamstring flexibility does increase with stretching passively and muscle stiffness does decrease with passive stretching, pain intensity defines no change in tolerance of stretch.[19] JPK Halbertsma, conclusion drawn from this study was that there was negligible effect of stretching hamstring passively.[20] RYW Law, study revealed that in subjects with chronic MS pain, 3 weeks of stretch altered the tolerance discomfort but not the muscle flexibility. [21]

DISCUSSION:

The two types of treatment studied were muscle energy techniques and passive static stretching. The mechanism of increasing muscle flexibility involves both neurophysiological (stretch tolerance) and mechanical factors (viscoelastic and plastic changes) [10]. The 3 weeks of regular stretching are required to change physiological properties of muscles and cause permanent lengthening.[22] Several studies with the objective of determining the best treatment to increase hamstring flexibility have been conducted. The results of METs application in this study are in agreement with the previous studies. [23-25] Most of the researches that involve the METs focus on the application of single treatment but in this study, reading was taken after four weeks to get more reliable results. Moreover, the effectiveness of muscle energy techniques may be due to the inhibitory effect of Golgi tendon reflex, which is believed to be activated in isometric contraction of the muscle. There has been very limited research on the comparison of static stretch and METs, although previous researchers have found the effectiveness of both on an individual basis. The episodes of passive stretch were also found to cause discomfort in patients, this could be the cause of less improvement in muscle extensibility with passive stretching than MET in this study[26]. The results of this study may be useful for health professionals in their clinical practices in determining the best treatment modality for tight hamstrings. In METS as compared to passive static stretching there is a combination of isometrics and then elongation of the muscle fibers whereas in static stretching there is just increase in the length of the fiber.

Therefore, the best and fast result showing technique needs to be addressed. Sonal stated that each technique produced desired results for improving hamstring flexibility. But Combination of both the techniques outweighed the effectiveness produced by the two techniques applied alone. Therefore, the mixture of techniques is highly recommended. These all three techniques are very simple and safe and could be used to improve hamstring flexibility.[25,27]Further prevention strategies can also be recommended for the low back including posture education and ergonomic sitting [28]

CONCLUSION:

Muscle energy techniques and static passive stretching, both were effective in improving the hamstring flexibility and had better effect on improving hamstring flexibility in patients of non-specific low back pain.

RECOMMENDATIONS

The use of METs and Static Exercise for the improvement in health-related quality of life, pain and Range of Motion can be a useful approach.

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