

Effectiveness of Mulligans Sustained Natural Apophyseal Glide and Conventional Management in Lateral Epicondylalgia: A Hypothesis

Priyanka Mundra¹, Ravinder Mahapatra¹

¹Department of Musculoskeletal Physiotherapy, Sancheti Healthcare Academy, Sancheti Institute College of Physiotherapy, Thube Park, ShivajiNagar, Pune, Maharashtra, India.

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Address of Correspondence

Dr. Ravinder Mahapatra

Sancheti Healthcare Academy, Sancheti Institute College of Physiotherapy, 12, Thube Park, ShivajiNagar, Pune - 411005, Maharashtra.

Email: dravinder82@gmail.com

Abstract

Background: Lateral epicondylalgia is characterized as pain and tenderness at and around the lateral epicondyle of the humerus manifested by activities involving the hand in gripping or manipulating an object, such as that required when lifting objects, shaking hands, dressing and desk or house work. It usually affects the dominant arm and occurs in both males and females aging between 30- 60 years, more commonly seen in females and they show a longer duration of symptoms. It has been reported that there is an association between lateral epicondylitis and dysfunction in the cervical spine and at the cervicothoracic junction. Considering the increasing prevalence of the cervicothoracic impairments present in these patients, literatures have demonstrated a trend towards treatment of the cervical and thoracic spine in this patient population. This is usually seen as the dermatomes around the lateral aspect of the humerus is same with the nerves coming out from the lower cervical and thoracic region (C6-T1). Addition of Mulligans Sustained Natural Apophyseal Glide in lateral epicondylalgia is tried to correct the positional fault at the zygapophyseal joint and further reduce the compression on the root. The objective of the study is to study the effects of Mulligan's Sustained Natural Apophyseal Glide and conventional management in lateral epicondylalgia by a purposive random sampling on 60 subjects (30 in each group). One group receives Mulligans Sustained Natural Apophyseal Glide along with the conventional management and the control group receiving conventional management for 5 consecutive days.

Hypothesis: There will be improvement with Mulligans Sustained Natural Apophyseal Glide along with the conventional management in lateral epicondylalgia than only the conventional management.

Clinical Importance: Adding Mulligan's Sustained Natural Apophyseal Glide on the cervical region helps in primary correction of the positional fault which causes the opening of intervertebral foramen and facet joint thus releasing the referred pain over the lateral aspect of elbow (lateral epicondylalgia). There will be relief of symptoms for pain, improvement in the grip strength and increase in functional ability.

Future Research: Comparison of other manual therapy for the cervical region can be studied in the future for treating lateral epicondylalgia.

Keywords: Lateral epicondylalgia, physical therapy, manual therapy, SNAGS.

THESIS SUMMARY

Introduction

Lateral epicondylalgia (LE) is a painful musculoskeletal condition that has a tremendous impact on the society and challenges the healthcare industry. Lateral epicondylalgia is characterized as pain and tenderness over the lateral epicondyle of the humerus, the radial head, the fascia between and the origin of the extensor muscles with consequences of altered function and disability which is manifested by activities involving the hand in gripping or manipulating an object, such as that required when lifting objects, shaking hands, dressing and desk or house work[1]. It usually affects 5–15% of the working population, is more prevalent in women than in men and mainly in the dominant arm[2]. The clinical presentation usually depends on the underlying pathological and aetiological processes, and thus, it involves both pathophysiological as well as nociceptive system mechanisms for pain in lateral epicondylalgia. Physical therapist till date use conservative approach as the treatment of choice for Lateral Epicondylalgia having different theoretical mechanisms of action, but all work on the same aim, to reduce pain and improve function. The treatment includes corticosteroid injection, NSAIDs, Muscle Stretching and Strengthening exercise, Sports taping technique, Cryotherapy, use of Orthotic device, Manipulative technique, Acupuncture, Ultrasound, Laser, TENS, Electromagnetic field and Ionization[3]. Most studies attribute pain at the lateral epicondyle to overstrain of the insertion of the extensor carpi radialis brevis but some reports suggest that painful disorders of the cervical and thoracic can sometime cause a referred pain to the lateral aspect of the elbow. It can be because of a reflex chain between intervertebral joint dysfunction and peripherally localized soft-tissue pain syndromes. One study in 2008 stated that there is a relation between lateral elbow pain and pain in the vertebral spine (C2–T7). The cervical and thoracic spine should be included in the assessment of patients with lateral elbow pain[4]. Cyriax concluded that pain in the elbow provoked by wrist movements could also be originated from the lower cervical spine. Study conducted in 1993 had found out that there is clinical evidence of involvement of radial nerve because of less extensible neural tissue in arm. A confounding factor in this type of referred pain is the degenerative changes in the cervical spine. Sterling et al found that cervical posterior-anterior nonthrust mobilization decreased pressure sensitivity and reduced over activity of the superficial neck flexor muscles during the craniocervical flexion test. Vicenzino; Collins and Wright have stated that application of the cervical lateral glides in such subjects immediately improves pain, range of motion and grip strength. Mulligan's sustained Natural Apophyseal Glide works on the principle of correcting the positional fault at the zygapophyseal joint and thus decreasing the symptoms. Thus in the recent literature, trend has been set towards the treatment of cervical and thoracic region in this patient population and demonstrate a rapid hypoalgesic effect and significant improvement in pressure pain threshold, pain-free grip strength, neurodynamics and pain scores relative to placebo and control conditions. Thus, various studies have been conducted on manual therapy directed at cervical and thoracic region but there is no evidence of using Mulligan's SNAGS in this patient population[5, 6, 7].

Hypothesis

Lateral epicondylalgia is also known as tennis elbow, epicondylitis, or

tendinopathy with characterized features of localized pain over lateral aspect of the elbow which can be worst on restricted wrist extension and on grip. It is predominant more in the age group between 35 to 55 yrs and more in females than in males. It is caused usually due to excess of repetitive manual tasks, lifting heavy, coupled activities wherein repetitive forearm rotational motions take place[14]. But in recent literature, pain over the lateral aspect of the elbow can be observed due to the nociceptive pain mechanisms and thus referred pain coming from the lower cervical spine[5,6,7]. Thus, adding Mulligan's Sustained Natural Apophyseal Glide on the cervical region helps in primarily corrects the positional fault at the zygapophyseal joint which causes the opening of intervertebral foramen and facet joint also increases the blood supply around the nerve sleeves of the nerve root by reducing the compression, thus releasing the referred pain over the lateral aspect of elbow (lateral epicondylalgia)[13]. Thus, it is hypothesized that adding Mulligan's cervical SNAGS in patients to the conventional management in lateral epicondylalgia would give an improvement when compared with the only conventional management in this patient population.

The study aims to study the effects of Mulligan's Sustained Natural Apophyseal Glide and Conventional Management in lateral epicondylalgia. A prospective simple randomized control trial will be performed after taking the ethical approval by the institution. By purposive random sampling, 60 subjects will be randomly allocated into 2 groups (30 per group) from orthopaedic physiotherapy centre and tertiary health centre. Males and females both within the age group of 30- 50 yrs and unilateral involvement will be included in the study. Patients showing symptoms of tennis elbow along with neck discomfort, pain score between 4-7 on VAS and since 2-6 weeks will be included in the study. Patients having any previous fracture, dislocation or bony abnormalities in elbow or wrist joint and cervical spine, cervical radiculopathy, space occupying lesion, instability, myelopathy and cervical spondylosis will be excluded from the study. Also if any other systemic illnesses like metabolic, metastatic, infective disorders, any other neurological abnormalities or multiple diagnoses will be excluded. After taking the written informed consent from the patient, they will be randomly divided into 2 groups.

Before the intervention, all patients will be evaluated and demographic data based on age, name, sex, occupation, duration and presence of symptoms, medications and present activity level and will be objectively assessed on the following parameters: (15, 16, 17).

- 1) Pain on Visual Analog Scale
- 2) Grip strength on hand held dynamometer
- 3) Cervical range of motion by inclinometer.
- 4) Functional disability by Disability of Arm, Shoulder and Hand score.

All these parameters will be collected prior to the treatment and on the 5th day of the treatment.

Participants will be assigned into 2 groups: control group (Group A) and experimental group (group B). Both the group will receive conventional management for lateral epicondylalgia which includes ultrasound: based on previously published guidelines, consisted of 100% duty cycle, at a frequency from 1 Mhz to 3 Mhz, delivered at an intensity of 0.8 W/cm² over the area of the lateral epicondyle for 7 minutes for 5 consecutive days., stretching and strengthening exercises; 6 repetitions, 3 times before treatment and 3

times after strengthening exercise with 30 secs hold, while 30 secs rest interval and 3 sets of 10 repetitions with 1 min rest interval between sets. The experimental group (group B) will be given additional Mulligans Sustained Natural Apophyseal Glide directed at the cervicothoracic should be given in a dosage of "Rule of 3" for 5 consecutive days(12, 18-27).

Paired t-test shall be used for analysing intra-group assessment for grip strength and cervical range of motion. Unpaired t-test shall be used for analysing inter-group assessment of grip strength and cervical range of motion. Wilcoxon signed rank test shall be used for inter-group assessment of pain and for function and activity level using the disability of arm, Shoulder and Hand Score. Man-Whitney test shall be used for intra-group assessment of pain and for function and activity level using the disability of arm, Shoulder and Hand Score.

Discussion

Lateral epicondylalgia does have an effect on the upper limb mechanical parameters (mass, stiffness and damping). A study conducted with the help of MRI and grip strength of injured and uninjured limb and concluded that there was a significant effect of injury and dominance was observed on stiffness, damping and grip strength. An injured upper limb had, on average, 18% less stiffness, 21% less damping and 50% less grip strength. The dominant limb had on average 15% more stiffness 33% more damping and 24% more grip strength than the non-dominant limb[2]. One study states that there is prevalence of about 70% indication of pain in the cervical and/or thoracic spine in lateral epicondylalgia [4]. Wright et al. proposed that in patients with lateral elbow pain could have arisen from structures within the lower cervical spine by the nociceptive trigger activating the process of central sensitisation[27] Vicenzino and Wright, who noted that 57-90% of subjects participating in studies of lateral elbow pain had segmental hypomobility in the lower cervical spine[10]. The hypoalgesic effect after giving mobilization at the cervical or thoracic region can be by stimulating central control mechanisms (periaqueductal gray area) and stimulation of the descending inhibitory mechanisms, as proposed by Vicenzino et al[8]. Retrospective studies demonstrated that patients receiving treatment directed at both the elbow and cervicothoracic spine achieved a successful outcome in fewer visits. Mobilization techniques directed at the cervicothoracic spine, results in a reduction of reflex inhibition, allowing the pain to reduce, the muscle to produce a greater force and improve the functional ability. Performing mobilization techniques at the cervicothoracic spine may assist in reducing abnormal afferent input and thereby reduce the symptoms associated with lateral epicondylalgia. The diagnostic criteria utilized to classify the patients, as having lateral epicondylalgia has not been scientifically validated as the assessment of the cervical spine is usually missed. Therefore, it is possible that many of the subjects can be misdiagnosed and that their symptoms may have consisted of somatic pain referral directly from the cervical or thoracic spine. Relative to the innervations of the cervical spine and structures in the upper limb, it is possible that symptoms could be perpetuated by structures in the cervical spine. Therefore, management of the cervical spine may have in itself led to successfully addressing the impairments that resulted in referred pain patterns[7]. Mulligan proposed that injuries or sprain might result in minor positional fault to a joint thus causing restriction in physiological movement. Sustained Natural Apophyseal Glide primarily corrects the positional fault at the zygapophyseal joint by

opening the intervertebral foramen and facet joint; which helps in increased blood supply around the nerve sleeves of the nerve root by reducing the compression(12). Andrea Moulson et al studied a relationship between the cervical SNAGS and sympathetic nervous system activity in the upper limb of an asymptomatic population and she concluded that the technique has a sympathoexcitatory effect. Many studies showed that manipulation-induced analgesia contributes via a centrally mediated phenomenon, rather than a local mechanism thus creates a generalized sympathoexcitatory response to the SNAG technique(27).

Thus, the hypothesis states that there will be improvement by giving Mulligans SNAGs on the cervical along with the conventional management which includes ultrasound and stretching and strengthening exercises for patients with lateral epicondylalgia and helping the subjects to achieve their functional ability faster.

Clinical Importance

Adding Mulligan's Sustained Natural Apophyseal Glide on the cervical region helps in primarily corrects the positional fault at the zygapophyseal joint which causes the opening of intervertebral foramen and facet joint also increases the blood supply around the nerve sleeves of the nerve root by reducing the compression, thus releasing the referred pain over the lateral aspect of elbow i.e. lateral epicondylalgia. There will be relief of symptoms for pain, improvement in the grip strength and increase in functional ability.

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