Comparative study on effectiveness of trigger point release versus cervical mobilization in chess players with mechanical neck pain

Dr. Basavaraj Motimath and Dr. Nabeel Ahammed

Abstract

Background: Mechanical neck pain can be defined as generalized neck and/or shoulder pain with mechanical characteristics including symptoms provoked by maintained neck postures or by movement. Mechanical neck pain causes morning stiffness, pain on forward flexion and also returning to erect position, pain is often aggravated by extension, lateral flexion, rotation and exercises. When playing chess on chess board for many hours continuously the players may notice increasing aches and pain in neck.

Objective: To find out the effectiveness of trigger point release versus cervical mobilization in chess players with mechanical neck pain

Study design: Pre-test Post-test Experimental study design

Methods: Subjects will be randomly selected through inclusion criteria and exclusion criteria. Pre and post treatment assessment of pain and Disability using Neck Disability Index and range of motion using Universal Goniometer will be taken. Subject will be assigned to group A and group B with 15 patients in each group. Treatment will be given 3 sessions in 1 week for 1 month duration.

Outcome Measures: Neck Disability Index and Universal Goniometer

Results: There is significant difference in effectiveness of trigger point release versus cervical mobilization in chess players with mechanical neck pain.

Conclusion: This experimental study was performed on 30 subjects 15 subjects in each group with complaints of neck pain with intervention in the form of trigger point release and SNAG. The group treated with SNAG approach had significant improvement in ROM of cervical joint, pain and disability due to mechanical neck pain than those treated with trigger point release.

Keywords: Trigger point release, sustained natural apophyseal glide, chess player, mechanical neck pain, range of motion

Introduction

Mechanical neck pain can be defined as generalized neck and/or shoulder pain with mechanical characteristics including symptoms provoked by maintained neck postures or by movement, or by palpation of the cervical muscles. Although the exact pathology of idiopathic neck pain is not completely understood[1]. Mechanical neck pain usually doesn’t cause weakness or numbness in the arm or hand because the problem is not from pressure on the spinal nerves[2]. Mechanical neck pain causes morning stiffness, pain on forward flexion and also returning to erect position, pain is often aggravated by extension, lateral flexion, rotation and exercises. Mechanical neck pain affects 45–54% of the general population at some time during their lives and can result in severe disability[3]. Certain studies states that the incidence of neck pain and median age are 35% and 27 years respectively[4]. Determining the most appropriate intervention for individuals with neck pain remains a priority for researchers. Physiotherapy is usually the first management approach for patients with mechanical, idiopathic insidious neck pain, and manual therapy is often the preferred intervention[5]. Major causes of many of these disorders and injuries are technological advances increased use in repetitive motions, competitive work environments, inflexible workstations design and poor education/training on proper workstation design[6]. Mulligan concept of mobilization with movements (MWMs) first used in cervical spine, carry the acronym SNAGS. It stands for sustained natural apophyseal glides used to improve function restriction or pain in flexion, extension, rotation, side flexion of
cervical spine [19]. SNAG is the technique where an accessory glide is applied to the spinal segment with a concurrent force sustained at the end of the range. According to Mulligan the effect of MWMs is based on the premise that pain is associated with positional fault in joint with resultant subtle “biomechanical” changes such as joint restriction and stiffness. Trigger points are hyperirritable spots within a palpable at band of a skeletal muscle that is painful on compression, stretch or overload of the affected tissues and that can give rise to a typical referred pain pattern. Myofascial trigger points from neck and shoulder muscles might play an important role in the genesis of mechanical neck pain. There are epidemiological studies suggesting that trigger points represent an important source of musculoskeletal disorder. Trigger point therapy an reduce pain, increase movement, and allows the muscles to lengthen and become stronger again. To treat trigger points, heavy pressure must be applied to the trigger point. MWMs are mobilizations with movement and are applied to the peripheral joints. NAGS are natural apophyseal accessory glides applied to the cervical spine with the patient passive. SNAGS are sustained natural apophyseal accessory glides whereby the patient attempts to actively move a painful or stiff joint through its range of motion whilst the therapist overlays an accessory glide parallel with the treatment plane. Sustained natural apophyseal glides used to improve function restriction or pain in flexion, extension, rotation, side flexion of cervical spine. According to Mulligan the effect of MWMs is based on the premise that pain is associated with positional fault in joint with resultant subtle “biomechanical” changes such as joint restriction and stiffness.

A Trigger point (TrP) is defined as a hyperirritable spot in skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band. There are several precipitating and perpetuating factors such as mechanical, nutritional, metabolic, and psychological factors resulting in the formation of Trigger points. Presence of tender spot within the taut band in skeletal muscles, Palpable or visible local twitch response, Jump sign, typical referred pain pattern are the important signs of TrPs. Active TrPs cause clinical symptoms, and their local and referred pain is responsible for patients’ complaints. An active TrP is distinguished from a latent one when referred pain elicited by pressure applied to the TrP is recognized as a recent, familiar pain by the subject. In patients, this elicited pain corresponds to at least part of their clinical pain complaint. Both active and latent TrPs can provoke motor dysfunctions, e.g., muscle weakness, muscle imbalance, altered recruitment pattern of the stabilizer muscles, or muscle inhibition in either the affected muscle or in functionally related muscles. Furthermore, latent TrPs may not be an immediate source of pain, but they can elicit referred pain with mechanical stimulation or muscle contraction. In addition, latent TrPs may disturb normal patterns of motor recruitment and movement efficiency.

The formation of TrPs may result from a variety of factors, such as severe trauma, overuse, mechanical overload, or psychological stress. Although the etiology of TrPs is not completely known, recent studies have hypothesized that the pathogenesis of TrPs results from injured or overloaded muscle fibers. This could lead to endogenous (involuntary) shortening, loss of oxygen supply, loss of nutrient supply, and increased metabolic demand on local tissues. The most credible etiological explanation of TrPs is the integrated hypothesis, which suggests that abnormal depolarization of motor endplates and sustained muscular shortening give rise to a localized “ATP energy crisis” associated with sensory and autonomic reflex arcs that are sustained by central sensitization. A recent study provides evidence of sympathetic facilitation of mechanical sensitization and facilitation of the local and referred pain reactions in TrPs.

Methods and Materials
A pre-post experimental study was conducted on 30 subjects. Subjects were assigned to group A and group B with 15 patients in each group. Inclusion criteria was both Male and Female chess players age group between 18 to 25 chess players who play in front of chess board more than 1 hour. Exclusion criteria was Recent undergone surgery or any acute inflammation in neck, spinal pathology (spondylolisthesis), person with ankylosing spondylitis, any open wound around the neck, history of cervical fracture, infection & dislocation and Those who play chess in laptop. Ethical approval was obtained prior to the study. Written informed consent was taken from the subjects. For each patient baseline assessment was obtained and brief demonstration about intervention explained. All subjects were instructed to discontinue if they had any form of discomfort during the procedure.

Procedure
The subjects were randomly selected through inclusion criteria and informed consent was taken from the subject’s Demographic data will be collected. The subjects were explained about the treatment. The subjects were positioned comfortably and assessed thoroughly about his/her condition. Pre and post treatment assessment of pain using Pain numeric rating scale, Disability using Neck Disability Index and range of motion using Universal Goniometer was taken. Subjects were assigned to group A and group B with 15 patients in each group. Treatment was given 3 sessions in 1 week for 1 month duration.

Patients were divided into two groups: In group A Trigger point release was given to the patients who having mechanical neck pain. The diagnosis of the TrP was performed following five diagnostic criteria: Presence of a palpable taut band in a skeletal muscle, Presence of a hypersensitive tender spot in the taut band, Local twitch response elicited by the snapping palpation of the taut band, Reproduction of the typical referred pain pattern of the TrP in response to compression. Spontaneous presence of the typical referred pain pattern and/or patient recognition of the referred pain as familiar. Trigger point release given in sternocleidomastoid, levator scapulae, upper trapezius and sub occipital muscles Patient position was sitting or laying. For group B cervical mobilization (SNAG) sustained natural apophyseal glides was given. SNAG sustained natural apophyseal glides was applied by the therapist using 2-3 sets of 4-6 repetition for each level of cervical spine, for improving extension, rotation, and side flexion. The subject was in sitting position and the therapist stands behind him. The medial border of one thumb is placed on the tip of the spinous process vertebral. The thumb was slope at 45 degrees in the direction of eyeball and the other thumb reinforce this other finger are comfortably placed laterally on each side of the neck. Treatment was given for 1 minute per trigger point. For rotation glide spinous process up in direction of treatment plane. Glide is being maintained and subject turns his head slowly towards the restricted side and sustain for few seconds. For side flexion glide spinous process up in direction of treatment plane. Glide is being maintained and subject tilts his
The Mulligan concept is integral to the clinical practice of pain manipulation in computer professionals with mechanical neck pain. Statistical data reveals that significant difference in treatment (pre test) and on the last day of the treatment (post test). Then data's were analyzed statistically. The outcome measures used of pain and disability using Neck Disability Index and range of motion using Universal Goniometer. Each measurement was done on the first day of week for 1 month. The patients who having mechanical neck pain and group B Trigger point release with ergonomic advice will be given to group A (15 patients in each group). The group A received given, for a treatment duration will be given 3 sessions in 1 week for 1 month. The outcome measures used of pain and disability using Neck Disability Index and range of motion using Universal Goniometer. Each measurement was done on the first day of treatment (pre test) and on the last day of the treatment (post test). Then data’s were analyzed statistically.

### Data Analysis

SPSS16.0 software was used to find out the statistics mentioned below: Kolmogorov-Smirnov test was done to find out the normality. Paired t test was used as parametric test to find out the intra group significance. Wilcoxon signed rank test was used as non parametric test to find out the intra group significance. Independent t-test were used to analyze inter-group significance. Mann Whitney U-test was used to analyze inter-group significance.

<table>
<thead>
<tr>
<th>Outcome measures</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation(±)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDI</td>
<td>15</td>
<td>32</td>
<td>54</td>
<td>45.46</td>
<td>6.255</td>
</tr>
<tr>
<td>POST-TEST</td>
<td>15</td>
<td>18</td>
<td>36</td>
<td>30.53</td>
<td>5.527</td>
</tr>
<tr>
<td>EXTENSION</td>
<td>15</td>
<td>40</td>
<td>55</td>
<td>47.67</td>
<td>5.3</td>
</tr>
<tr>
<td>POST-TEST</td>
<td>15</td>
<td>50</td>
<td>65</td>
<td>57</td>
<td>5.606</td>
</tr>
<tr>
<td>LAT ROTATION</td>
<td>15</td>
<td>40</td>
<td>55</td>
<td>52</td>
<td>5</td>
</tr>
<tr>
<td>POST-TEST</td>
<td>15</td>
<td>55</td>
<td>70</td>
<td>61</td>
<td>4.08</td>
</tr>
<tr>
<td>LAT FLEXION</td>
<td>15</td>
<td>25</td>
<td>35</td>
<td>29</td>
<td>3.872</td>
</tr>
<tr>
<td>POST-TEST</td>
<td>15</td>
<td>32</td>
<td>54</td>
<td>44.27</td>
<td>7.004</td>
</tr>
<tr>
<td>NDI</td>
<td>15</td>
<td>18</td>
<td>34</td>
<td>24.133</td>
<td>5.974</td>
</tr>
<tr>
<td>POST-TEST</td>
<td>15</td>
<td>40</td>
<td>55</td>
<td>46.667</td>
<td>6.172</td>
</tr>
<tr>
<td>EXTENSION</td>
<td>15</td>
<td>50</td>
<td>65</td>
<td>58.667</td>
<td>4.418</td>
</tr>
<tr>
<td>LAT ROTATION</td>
<td>15</td>
<td>40</td>
<td>55</td>
<td>49.333</td>
<td>5.3</td>
</tr>
<tr>
<td>POST-TEST</td>
<td>15</td>
<td>55</td>
<td>70</td>
<td>62</td>
<td>4.92</td>
</tr>
<tr>
<td>LAT FLEXION</td>
<td>15</td>
<td>20</td>
<td>35</td>
<td>29</td>
<td>4.705</td>
</tr>
<tr>
<td>POST-TEST</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>38.66</td>
<td>4.418</td>
</tr>
</tbody>
</table>

**Mean and Standard Deviation of Scales Used In both Group A and Group B**

### Discussion

This study is to find out the in effectiveness of trigger point release versus cervical manipulation in computer professionals with mechanical neck pain. Mechanical neck pain can be defined as generalized neck and/or shoulder pain with mechanical characteristics including symptoms provoked by maintained neck postures or by movement, or by palpation of the cervical muscles. Although the exact pathology of idiopathic neck pain is not completely understood

In this study, Subjects with mechanical neck pain are taken into consideration. From a large number of subjects with mechanical neck pain the subjects are selected by the proper screening and fulfilling the inclusive and exclusive criteria. 30 patients diagnosed with mechanical neck pain, disability and ROM deficit was selected and grouped into group A and group B (15 patients in each group). The group A received Trigger point release with ergonomic advice will be given to the patients who having mechanical neck pain and group B cervical mobilization (SNAG) with ergonomic advice will be given, for a treatment duration will be given 3 sessions in 1 week for 1 month.

The outcome measures used of pain and disability using Neck Disability Index and range of motion using Universal Goniometer. Each measurement was done on the first day of treatment (pre test) and on the last day of the treatment (post test). Then data’s were analyzed statistically. Statistical data reveals that significant difference in effectiveness of trigger point release versus cervical manipulation in computer professionals with mechanical neck pain.

The Mulligan concept is integral to the clinical practice of many physiotherapists and includes techniques such as sustained natural apophyseal glides (SNAGs), natural apophyseal glides (NAGs) and mobilization with movements (MWMs). Several clinical studies have suggested that these techniques are an effective physiotherapeutic tool in the treatment of neuromuscular pain and dysfunction. SNAGS are sustained natural apophyseal accessory glides whereby the patient attempts to actively move a painful or stiff joint through its range of motion whilst the therapist overlays an accessory glide parallel with the treatment plane. The neurophysiologic mechanism by which spinal manipulative therapy is effective in reducing pain is not completely understood. One possible mechanism for improvement in the intervention group in the present study could be that the manipulative procedure may induce a reflex inhibition of pain or reflex muscle relaxation by modifying the discharge of proprioceptive group I and II afferents. A second possible mechanism for the improvement in the intervention group might be a pre synaptic inhibition of segmental pain pathways and possibly activation of the endogenous opiate system.

Trigger point (TrP) is defined as a hyperirritable spot in skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band. There are several precipitating and perpetuating factors such as mechanical, nutritional, metabolic, and psychological factors resulting in the formation of Trigger points. Presence of tender spot within the taut band in skeletal muscles, Palpable or visible local twitch response, Jump sign, typical referred pain pattern are the important signs of TrPs.

Trigger point treatment successfully release trigger points by
holding pressure steadily on a trigger point until it releases and sliding the finger, hand, etc along a usually venous direction of a muscle, creating a vacuum/suction effect upon the circulation which "flushes" the tissue rapidly, introducing freshened circulatory fluids quickly as well as "dumping" inflammatory chemicals present in the tissue back into general circulation. They are creating a compression to the tissue that temporarily compromises the circulation. The body responds to the compromise, which strives toward equilibrium, by sending a "flush" of blood and lymph, which contain constituents that temporarily alleviate pain (endorphins), which also "flush" out inflammatory chemicals (substance P, prostaglandins, bradykinin, etc.), and which also contain energy constituents for metabolic recovery for both the myofascial tissue and the neuromuscular junctions. 

In a study, Muñoz-Muñoz S et al. concluded that the referred pain elicited by active MTrPs in the neck and shoulder muscles contributed to symptoms in mechanical neck pain. In this study, there has been an increase in ROM of cervical joint and reduction of pain and disability by the application of SNAG. According using of outcome measures of NDI and GONIOMETER clearly proven that SNAG is more better that trigger point release. Hence, the study reveals that SNAG shows greater improvement than TRIGGER POINT RELEASE on disability and ROM in individuals with mechanical neck pain.

Conclusion

In conclusion, this experimental study was performed on 30 subjects 15 subjects in each group with complaints of neck pain with intervention in the form of trigger point release and SNAG. The group treated with SNAG approach had significant improvement in ROM of cervical joint, pain and disability due to mechanical neck pain than those treated with trigger point release.

Limitations

Patients included in this study were limited to those referred to a single unit. The study was conducted on a small sample size which might affect the generalization of results. Duration of study was less. Age group was only between 18yrs and 25yrs. Samples taken were of acute patients only. All measurements were taken manually and this may introduce human error which could affect the reliability of the study. NDI are subjective assessment tool, so there might be some errors while filling the scores by patient themselves.

References


Effectiveness self snag over conventional physiotherapy management in chronic neck pain among computer professionals, Shilpi Chabra Deepthi Chabra et al. 2007-2008, 2.
