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EFFECTS OF SUSTAINED NATURAL APOPHYSEAL GLIDES WITH MUSCLE ENERGY TECHNIQUE ON MECHANICAL NECK PAIN

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ABSTRACT

Introduction: Neck pain due to mechanical factors is common among general population specially people working in offices and on desktops. Sustained natural apophyseal glides (SNAGs) and Muscle energy technique (MET) are approaches used to reduce neck pain. **Objective:** To determine the effects of Sustained natural apophyseal glides (SNAGs) augmented with Muscle energy technique (MET) on mechanical neck pain. **Study Design:** Randomized control trial. **Setting:** Physical therapy department, Kulsum International Hospital. **Period:** 6 months. **Materials and Methods:** Patients having mechanical neck pain without any systemic or traumatic history were included in the study. Initially 83 participants were screened and 60 fulfilled the eligibility criteria. Participants were randomly allocated into two groups; experimental (n=30) and control (n=30), assessed at baseline and interventions were applied. Experimental group received SNAGs and MET where control group SNAGs and inferential current for 15 minutes 3 times a week for 6 weeks. 6 participants couldn't follow up and were excluded from the study. Numeric pain rating scale (NPRS) and neck disability index (NDI) were used as outcome measures. Participants were reassessed after 6 weeks and the data was statistically analyzed by SPSS 21. **Results:** There were 14 males and 13 females in experimental group while 12 males and 15 females in control group. The significant difference was observed in NPRS scores after intervention in experimental group; 7.1± 0.86 to 2.3± 0.73 as compared to control; 7.2± 0.98 to 3.1±0.87 with p=<0.01. NDI scores have improved from 20.70±2.86 to 14.00±3.08 in experimental group while 21.33±3.57 to 17.88±3.30 in control group. Between group comparisons showed significant changes in NDI in experimental group as compared to control group with p value <0.01.

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INTRODUCTION

Neck pain is a very common problem that can affect the subject's quality of life in a negative way, and may result in medical consumption, absenteeism, and disability.[1] Neck pain is second most frequent complain after low back pain. About 67% of all individuals' suffer neck pain at some stage of their life that may resolve within 1 month. However, the prevalence of chronic neck pain (CNP) approaches 14%.[2] Neck pain is becoming one of the major disabling conditions with time and its rate of occurrence is increasing with the advancement of technology and science, majority of which lead to bad neck and body postures. Usually, neck pain results due to abnormal mechanics of the anatomical structures related to neck, especially neck muscles. This can be caused by any mechanical or physiological change that occurs in neck muscles of a healthy individual which can result in discomfort, alteration of normal function and pain in the neck region. According to anatomy of the head and neck, there are certain group of muscles, tendons, ligaments and bones that contribute to stability and mobility of the neck. Therefore, any problem in any one of these structures results in discomfort and pain during activities of daily living.[3] Neck pain may persist for a longer duration due to mechanical or age related degenerative changes.[4] Degenerative

changes in spine can cause radiculopathy leading to pain that may cause disability.[5] Evidence suggests that age related wear and tear of about 95% occurs in the people aged 45 and above. A study conducted from 2000-2001 showed higher numbers of women was registered as compared to men for the management of neck pain.[6] In 2004, a cohort study suggested higher incidence of neck pain in women that was consistent most of the time which remitted with time; however, there was insufficient evidence regarding complete recovery from neck pain.[6]

A study conducted in 2011 on undergraduate students suggested that 46% of students suffered from neck pain. The study showed that all the students who used computer with poor posture and wrong biomechanics for more than one hour complained of neck pain.[7]

Age related wear and tear results in degenerative condition known as spondylosis. In cervical spondylosis, osteophyte formation and involvement of surrounding soft tissues is evident.[8] Apart from degeneration there are certain other aspects as well for neck pain development for example prolonged sitting posture with faulty posture among office workers. Although some studies also reveal that faulty postures may not be associated with production of pain in few individuals with bad neck mechanics.[9]

There are multiple factors that can influence the progression of pain and dysfunction of cervical spine. Social and psychological factors can be taken for instance as they play important role in development of neck pain. Social anxiety is one of the major risk factor for symptoms and worsening of condition.[10]

Various manual therapy techniques are being used for treatment of neck pain, Mulligan's sustained natural apophyseal glides (SNAGs) is one of known treatment technique. There are evidences that SNAGs can reduce pain and other symptoms of cervical spine.[11] The other technique under consideration is muscle energy technique (MET); has also shown reduction in neck pain intensity.[12] Taking the account of results of both techniques it was hypothesized that combination of Sustained Natural Apophyseal Glides (SNAGs) and muscle energy technique (MET) may have more improvement in the functional capacity of subject suffering from cervical spondylosis as compared to conventional treatment given with sustained natural apophyseal glides only. The study will help to introduce new techniques for benefit of community that can affect lifestyle of subjects with cervical spondylosis. It would also alleviate heath expenses that can further be important in reducing economic burden of a society. It is believed to enhance the quality of life style, add a little effort for healthy society and promote evidence based practice in rehabilitation.

METHODS

The study was single blinded, as the only therapist was aware of experimental and control group and the subjects were unaware of the treatment group and treatment technique applied on them. It was conducted at physiotherapy department of Kulsum International Hospital Islamabad and was approved by Kulsum International Hospital. Confidentiality of the participants was maintained. Informed written consent was taken from all subjects before enrollment to assure willingness and forms were also translated in Urdu to make all patients understand.

83 participants were assessed at baseline and subjects having mechanical or degenerative causes of neck pain were included in the study, patients with any kind of trauma, systemic and autonomic involvements were excluded from the study. A total of 60 individuals fulfilling the inclusion criteria were selected in the study out of which 6 couldn't follow up later. Subjects were then randomly placed in experimental and control group by coin tossing method. The study was

conducted for the duration of 6 months (January 2017 to June 2017). Each member of both groups underwent treatment session three times a week for a period six weeks. Group A was treated with sustained natural apophyseal glide (SNAGs) along with muscle energy technique (MET) as performed on subject laying in supine, following which the subject's head was moved to comfortable barrier point of limitation and he/she was asked to push his/her head against therapist hand with a force of approximately 20% of his/her strength, mean while the therapist resist his/her movement. This position is sustained for 8–10 seconds, while maintaining that position as the subject to inhale a breath deeply and when subject exhaled his breath, therapist moved to next barrier after sustaining 8 to 10 seconds then took 2 to 3 seconds of relaxation, then repeated the same regime for 3 to7 times 3 sessions per week and single session per day. Sustained natural apophyseal glides (SNAGs) repeated for 7 to 10 times in a session with hold of 10 seconds and repeated 3 times in a week. Control group (group B) was treated with Sustained natural apophyseal glides (SNAGs) for 7 to 10 times and Interferential given at 1KHZ for 15minutes 3 times a week for treating pain. Home exercise plan was provided to all subjects enrolled in both groups.

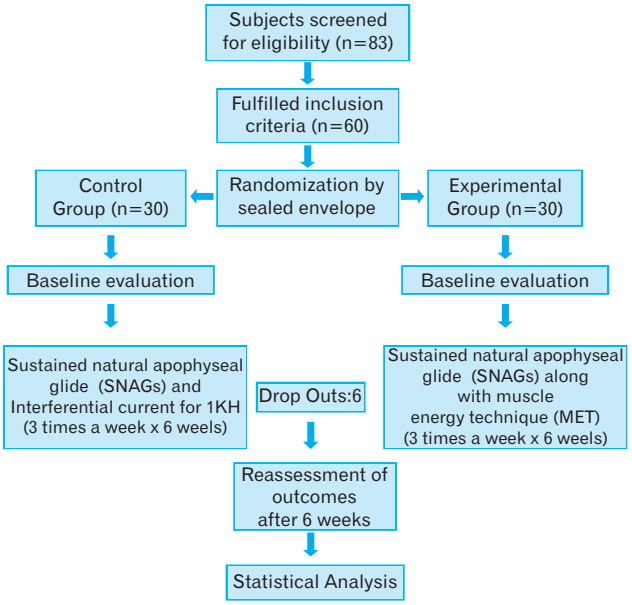

Figure 1: Consort Diagram

The Numeric Pain Rating Scale (NPRS), Neck disability Index (NDI), for assessing pain and functional disability and goniometer for range of motion (ROM) were used as outcome measures. All the subjects were assessed at baseline and at the completion of 6 weeks. Neck disability index score was measured prior and after interventions in both groups and data was analyzed using SPSS version 21. The statistical tests were applied at 95% level of significance α (0.05) to determine the difference between the two interventions. Independent and paired t-tests were applied to find out the significance of the interventions.

RESULTS

There were 14 males in experimental group and 12 in control group, while there were 13 females in experimental group and 15 in control group. Mean age of the subjects is 40.037 years; the range for study is defined as 25 to 50 years as illustrated in table 1.

Table 1: Descriptive Statistics

Variable		Group A (n=27)	Group B (n=27)	Total (n=54)
Gender	Male	14	15	29
	Female	13	12	25
Medical Conditions	Hypertension	6	10	16
	GIT	5	2	7
	Nephrotic	0	2	2
	Cardiac	2	2	4
Past Surgeries		14	9	23
Addictions	Smoking	3	6	9
	Alcohol	0	0	0

Paired sample T test and independent sample test were applied for within and between group analysis. The results showed that Group A showed significant improvement in NPRS and NDI as compared to group B with a P value of <0.01 shown in table 2.

Table 2: Paired Sample T Test for NPRS and NDI

Outcome		Pre intervention	Post Intervention	P value
NPRS	**Group A (Mean±SD)**	7.1± 0.86	2.3± 0.73	<0.01***
	Group B (Mean±SD)	7.2± 0.98	3.1±0.87	<0.01***
	P value	-	<0.01***	
NDI	**Group A (Mean±SD)**	20.70±2.86	14.00±3.08	0.004
	Group B (Mean±SD)	21.33±3.57	17.88±3.30	<0.01***
	P value	-	<0.01***	

DISCUSSION

The randomized controlled trial aimed to assess the effects of SNAGs with MET and SNAGs without MET on pain and disability status of subjects of cervical spondylosis. The study inferred that SNAGs with MET has shown more reduction in pain and improvement in functional capacity of cervical spondylosis subjects as compared to SNAGs and conventional treatment. Neck Disability Index and Goniometry were used to measure functional capacity and range of motion in subjects. Clinically and statistically Group A (experimental) showed improvements as compared to Group B (control).

Apoorva Phadke et al. conducted a randomized control trial recently in 2016 to assess the effect of Muscle Energy Technique and static stretching on pain and functional disability in subjects with mechanical neck pain. The study is conducted on the sample size of 60 and compared the muscle energy technique with static stretching. The research showed that muscle energy technique is more effective for mechanical neck pain as compared to static stretching and conventional treatment techniques. Muscle Energy Technique has gross effects in subjects of mechanical neck pain.[12] In the present study Muscle energy technique in combination with sustained natural apophyseal glides showed more improvements in pain and range of motion in subjects with cervical Spondylosis. Both the present and above mentioned study showed similar results regarding Muscle Energy Technique.

A study conducted in 2015 to assess the effect of muscle energy technique on pain and disability in subjects with nonspecific back pain by Ajay Kumar et al. The study concluded a significant reduction in pain and disability of neck after the application of muscle energy technique.[13] Similarly the current RCT also showed improvements in pain and range of motion while using muscle energy technique in combination with other manual therapy technique. A case report conducted by Sudarshan Anandkumar to check the effect of natural apophyseal glide combined with neurodynamics in the subject of cervical pain and radiculopathy for management of symptoms. This case report speculated a potentially first-time description of successful conservative management of cervical radiculopathy in a subject utilizing simultaneous combination of sustained natural apophyseal glide and neurodynamic mobilization. Immediate improvements were seen in pain, cervical range of motion and functional abilities.[8] The present RCT involved Sustained natural apophyseal glides in combination with both conventional Physiotherapy techniques and Muscle Energy Technique and reduction in pain and improvements in neck disability index were observed.

CONCLUSION

Sustained natural apophyseal glides augmented with muscle energy technique are more effective than sustained natural apophyseal glides alone in alleviating pain and improving functional capacity of participants with cervical Spondylosis.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Nasir Sultan	Substantial contributions to the conception or design of the work; or interpretation of data for the work, drafting the work or revising it critically for important intellectual content. Also did agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.	
2	Kiran Khushnood	Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work, drafting the work or revising it critically for important intellectual content. Also reviewed the final version for submission.	
3	Riafat Mehmood	Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work, drafting the work or revising it critically for important intellectual content. Also did agreement to be accountable for all aspects of the work in ensuring that questions related to the work are appropriately investigated and resolved.