

Effects of Muscle Energy Technique versus Bruegger's Relief Exercise on the Forward Head Posture among electronic gadget users – A Pilot study

ANAM DALAWAR¹, HAMNA AFZAL², IRAM DALAWAR³, AHMAD MURTAZA⁴, ABDUL GHAFOR⁵, SHAMS FIAZ⁶

^{1,3,4}Doctor of Physiotherapy, Sargodha Institute of Health Sciences (GCUF)

²Senior Lecturer Sargodha Institute of Health sciences (GCUF)

⁵Doctor of Physiotherapy, Senior Lecturer, Allama Iqbal Medical College, Lahore

⁶Doctor of Physiotherapy, Sargodha Institute of Health sciences (GCUF), 03417993864, sshamsfiaz@gmail.com, 55 S.B Sargodha

Correspondence to Dr. Hamna Afzal, Email: Hamnaafzal101@gmail.com, Cell: 03460204515,

ABSTRACT

Background: Neck pain due to Forward Head Posture (FHP) caused by prolongs flexion of head and neck while using electronic gadgets. It causes different musculoskeletal complaints particularly affecting upper limb and neck region. Muscle Energy Technique is an efficient method to reduce the tightness and improve strength of muscles. Bruegger's Relief Exercise is helpful in improving posture.

Aim: To compare the effects of Muscle Energy Technique (MET) and Bruegger's Relief Exercise on pain, range of motion and function in patients of cervicgia due to FHP.

Method: A pilot study was performed. 24 subjects were recruited according to sample selection criteria and were assigned to Group A and B. Assessment of pain, function, Cervical ROM and Craniovertebral angle was taken using NPRS, NDI, Goniometer and photogrammetry. Group A received treatment with hot pack and Muscle Energy Technique. Group B received hot pack and Bruegger's Relief Exercise. Total 20 sessions were given to each patient in 4 weeks with 5 sessions per week. Both groups were reassessed after 4 weeks of treatment. Data was analyzed by using SPSS 23.

Results: There was statistically significant changes within both groups in the NPRS, NDI, CROM and Craniovertebral angle with p-value of < 0.05 Both were effective but using Bruegger's Relief Exercise showed more improvement.

Conclusion: Both treatment strategies were effective in decreasing pain, improving movement, regaining functional status, and correcting posture but using Bruegger's Relief Exercise is more efficient for treating neck pain due to FHP.

Key words: Forward head posture, Muscle energy techniques, Bruegger's relief exercise.

INTRODUCTION

There is wide agreement that neck pain is common in different populations and that this symptom has a major impact on a person's quality of life and healthcare needs. Neck issues also account for a significant part of work-related illness and disability, putting a strain on the compensation insurance systems¹.

Smart phones are the most commonly used devices among youngsters. Head position forward FHP is a poor head posture associated to musculoskeletal discomfort over a long period² The anatomical forward positioning of the head away from the body's centre line, where lower cervical vertebrae flex and upper cervical vertebrae extend, and the weight of the head supported by the neck is enhanced, is called as forward head posture (FHP) The bending of the head puts pressure on the joints and muscles surrounding the neck spine, and also activating trigger points in the suboccipital musculature, which can cause tension headaches, neck pain, and cervical headaches, as well as limiting neck mobility³.

When the head is tilted forward 15 degrees, approximately 27 pounds of force is applied, which rises to 40 pounds at 30 degrees, 49 pounds at 45 degrees, and 60 pounds at 60 degrees⁴.

As we all know, FHP weakens the respiratory muscles, which has a great impact on respiratory function. The scalene, upper trapezius, pectoralis major (PM) and levator scapula are important auxiliary respiratory muscles involved in inhalation. Prolonged FHP will weaken these muscles, thereby reducing their respiratory function⁵.

So the purpose of our study was to compare the results of MET with Bruegger's Relief exercises on FHP in electronic gadget users.

PATIENT AND METHOD

An experimental pilot study at Rai College and Doctors Trust Teaching Hospital Sargodha from June–July 2021 after IRB permission, in which 24 young adults, male and female patients of 18-35 years age with neck pain and craniovertebral angle less

than 52°, having use of electronic gadgets >4 hours a day, having neck pain which is aggravated by sustained posture and feeling of stiffness on turning the head and neck after long usages. Score of more than 3 on NPRS and more than 10 on NDI were included via a non-probability convenient sampling after receiving the informed consent. Participants were treated for 4 weeks, 5 sessions per week, total 20 sessions.

Patients having Inflammation malignancy, neurological disorder, metabolic disorders, Neck pain radiating into arms and upper extremity, Neck pain associated with headache and facial pain, Recent surgery, Vertebrobasilar insufficiency (VBI) positive, History of recent trauma and fractures of cervical spine and Patients having any other therapeutic intervention or medical treatment were excluded from study.

Each patient in group A Before applying METs was applied Heat pack for 10-15 minutes. We applied protocol for 4 weeks 20 Sessions (5 sessions in a week) and 10 sec rest between each segment with 3-5 time's repetitions than there was 7-10 sec Isometric contraction followed by 5 sec relaxation than 30 sec hold for MET stretch. Effort and counter pressure was modest (20%). MET were applied to Upper trapezius, Levator scapulae, Scalene and the Pectoralis major muscles.

Followed the 7-10 seconds isometric contraction and complete relaxation of all elements, the stretch was maintained for 30 seconds^{6,7}. In group B before applying Bruegger's relief exercise we applied Heat pack for 10-15 minutes than Participant was in a high sitting position. An elastic resistance band was wrapped on each hand of the participant leaving the palm open and instructed to abduct and extend of thumb along with fingers, followed by wrist extension and forearm supination, the participant were instructed to perform scapular retraction with chin tucked in, shoulder external rotation, elbow extension, shoulder abduction, and extension. Intervention was started from 10 seconds hold to 30 seconds with 2 seconds increment in every session. Rest time was 30 seconds, 4 sets 12 times repetition⁸.

Measurement tools for outcome included Craniovertebral angle which was measured by photogrammetry for forward head posture⁹, for cervical range of motion (ROM) universal Goniometer was used, for pain NPRS was used and for neck disability 'Neck Disability Index' (NDI) was used. Between group and with-in group

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analysis was done using parametric tests of significance by independent sample t-test and paired t test on SPSS version 23.0. Pre-treatment and post-treatment values were taken and there was no follow up.

Mean age of the participants was 26.91±5.08 years and 26.6±4.84 years for MET group and Bruegger’s relief exercise group respectively. Pain rating, cervicovertebral angle, and neck disability (Table 1), as well as cervical range of motion (p<0.05) (See Table 2), there is significant difference was observed between and within groups.

RESULTS

Table 1: within and between group score of neck pain (NPRS), disability (NDI) and cervicovertebral angle (CVA)

Variable		Pre-treatment mean±SD	Post-treatment mean±SD	P-value
Neck pain (NPRS)	Group A Muscle Energy Technique	6.16±0.83	2.16±0.71	0.000
	Group B Bruegger’s relief exercise	6.50±1.08	1.33±0.49	0.000
	P-value	0.409	0.003	
Disability (NDI)	Group A Muscle Energy Technique	24.16±2.32	15.16±2.08	0.000
	Group B Bruegger’s relief exercise	23.75±2.52	10.16±1.46	0.000
	P-value	0.679	0.000	
Cervicovertebral angle (CVA)	Group A Muscle Energy Technique	31.45±5.77	44.02±4.81	0.000
	Group B Bruegger’s relief exercise	32.46±3.56	49.02±4.68	0.000
	P-value	0.610	0.017	

Table 2: Cervical range of motion scores within and between groups

Variable		Pre-treatment Mean±SD	Post-treatment Mean±SD	P-value
Cervical Range of Motion				
Flexion	GroupA Muscle Energy Technique	26.91±5.56	41.25±5.6	0.00
	GroupB Bruegger’s relief exercise	29.41±4.42	48.91±7	0.00
	P-value	0.236	0.008	
Extension	GroupA Muscle Energy Technique	39.33±7.34	48.83±6.9	0.00
	GroupB Bruegger’s relief exercise	45.75±3.30	62.33±3.1	0.00
	P-value	0.014	0.000	
Right Lateral Flexion	GroupA Muscle Energy Technique	30.33±3.31	39.75±8	0.00
	GroupB Bruegger’s relief exercise	30.75±5.04	47.83±5.6	0.00
	P-value	0.813	0.009	
Left Lateral Flexion	GroupA Muscle Energy Technique	29.25±4.2	42.75±8.1	0.00
	GroupB Bruegger’s relief exercise	30.70±6.41	50.83±4.4	0.00
	P-value	0.506	0.006	
Right Rotation	GroupA Muscle Energy Technique	32.50±6.54	53.25±9.2	0.00
	GroupB Bruegger’s relief exercise	32.91±5.35	72.58±6.1	0.00
	P-value	0.866	0.000	
Left Rotation	GroupA Muscle Energy Technique	35.25±9.1	52.75±8.1	0.00
	GroupB Bruegger’s relief exercise	32.08±4.96	70.33±4.7	0.00
	P-value	0.304	0.000	

DISCUSSION

This study aimed primarily to evaluate the effects Muscle Energy Technique verses Bruegger’s Relief Exercise in Forward Head Posture in terms of pain, functional disability and cervical range of motion. Results indicated significant improvement in both groups. However, mean change in values in Bruegger’s Relief Exercise group is more improved as compared to Muscle Energy Technique group. One of the most common incorrect sagittal postures of the cervicovertebral region in senior persons is Forward Head Posture (FHP)¹⁰. The use of a computer or a smart phone for more than 6 hours per day is associated with a high prevalence of forward head posture. According to the findings, the increased frequency among university students could be related to excessive computer use

and poor posture during lectures^{11,12}. Present study results for within group analysis using paired t test indicated that subjects receiving treatment with Muscle Energy Technique exercise showed statistically significant reduction in pain, improvement in functional status, cervical ranges of motion, and posture with p-value<0.05. Previous study showed that PS (Passive stretch), MASS (massage) and MET are effective methods for improving ROM, strength, and PPT (pressure pain threshold) for musculoskeletal neck pain¹³. The use of Muscle Energy Technique exercise is helpful to reduce the pain and improve posture & alignment. Current study stated that Muscle Energy Technique exercise is effective to reduce pain which is evaluated by NPRS. This supports the use of exercise Muscle Energy Technique as an effective treatment for decreasing pain. In contrast to this, in

previous study it was concluded that muscle energy technique may play a role in the management of chronic mechanical neck pain¹⁴. Current study concluded that Bruegger's postural exercise is effective to reduce pain and functional disability, similarly a study conducted recently in 2021 on effects of prenatal exercise program combined with Bruegger's postural exercise on with pregnant woman with low back pain that there is reduction in pain and functional disability¹⁵. The CV angle is significantly smaller among individuals having neck pain than that in normal subjects. Craniovertebral angle is less than 52 degrees in FHP as compared to normal healthy subjects. In previous studies People with small Craniovertebral angle have a greater forward head posture, and more disability¹⁶.

CONCLUSION

The current study concluded that the use of physiotherapy treatment for neck pain due to forward head posture, primarily muscle energy technique exercise and Bruegger's relief exercise, is effective in minimizing pain, functional disability, and enhancing cervical posture and range of motion. Bruegger's relief exercise is more effective to reduce pain, disability and improve posture and ROM.

Recommendations: Statistically calculated sample size should be conducted for randomized controlled trial, to compare the effects of energy technique exercise and Bruegger's relief exercise with conventional physical therapy management or to determine if the results are purely due to the treatment modality or whether they are due to the natural progression of the disease, a randomized controlled trial of control groups should be conducted.

Disclaimer: The current pilot study was approved by Iranian Registry of Clinical Trials with Trail Id 5803 and IRCT Id IRCT20201019049069N3. Study registered in 26-092021 with membership number 49069.

Conflict of Interest: None.

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