COMPARISON OF THE EFFECTS OF ELDOA TECHNIQUE AND SUB-OCCIPITAL MUSCLE INHIBITION TECHNIQUE ON PAIN AND DISABILITY IN PATIENTS WITH TEXT NECK SYNDROME.

Raiqa Rafique[1], Hafiza Noor[2], Muhmmad Sohaib Roomi[3], Mahnoor Shehzadi[4], Dr Muneeba Najeeb[5], Maryam Shahzadi[6], Mahrukh khan[7], Muhammad Abbas[8]

1. Raiqa Rafique, Consultant physiotherapist at Bhatti Hospital Kasur, Pakistan. Email: raiqarafique@gmail.com

2. Hafiza Noor, Consultant physiotherapist at Al-Noor Physiotherapy Clinic Faisalabad, Pakistan. Email: hafizanoor01@gmail.com

3. Muhmmad Sohaib Roomi, HOD at Khairpur Institute of Physiotherapy and Rehabilitation Science Khairpur, Pakistan. Email: sohaibroomi457@gmail.com

4. Masters in advance physiotherapy Missshehzadi30@gmail.com

5. Dr Muneeba Najeeb, Demonstrator at CMH Lahore medical college and institute of dentistry Lahore, Pakistan. Email: muneeba.najeeb2015@gmail.com

6. Maryam Shahzadi, Demonstrator at The university of Lahore, Pakistan. Email: shahzadimaryam821@gmail.com

7. Mahrukh khan, Physiotherapist at GCU Faisalabad, Pakistan. Email: dr.mahrukh58@gmail.com

8. Muhammad Abbas, Lecturer at Government College University, Faisalabad, Pakistan. Email: Muhammad.abbas9@yahoo.com (corresponding author)

Abstract

Background: The majority of adult patients who have neck pain report it as a common health issue. However, relatively recent data indicate that the prevalence of this pertinent issue is shifting from adulthood to all younger ages as a result of new technology. In fact, excessive and improper use of personal computers, especially cell phones, may contribute to the emergence of "text neck syndrome," a complicated combination of clinical symptoms (1)**Aims and Objectives**: This study aims to compare the effect of Elongation Longitudinaux Avec Decoaption Ostéo Articulaire (ELDOA) and sub-occipital muscle inhibition technique in reducing pain and disability in patients with text neck syndrome. **Material and methodology**: This is a randomized controlled trial(this trial has been registered in Iranian registry of clinical trials by the id no: IRCT20210811052138N6) with 40 sample size. Data was collected through convenient sampling technique being recruited from the students of College of Physical Therapy, Government College University Faisalabad having a certain inclusion/exclusion criterion along with a consent form being signed prior to the enrollment of subjects. Recruited participants were divided into two groups: the group 1 which consist of 20 participants on which ELDOA technique was applied along with the baseline treatment; the group 2 consist of 20 participants on which sub-occipital muscle inhibition technique was applied along with the baseline treatment. **Statistical analysis**: Data was analyzed by SPSS Version 22. **Results:** The results of pain in Group A on which ELDOA technique was performed had more significance than Group B on which sub-occipital muscle inhibition

technique was applied because the mean of group A for pain intensity dropped from 7.65 to 2.90 and that of group B dropped from7.25 to 5.25. The mean difference of pain intensity in group A was 4.75 and that in group B was 2.0 **Conclusion:** the ELDOA technique proved to be more effective exercise than the sub-occipital technique. So, the ELDOA technique when applied in text neck syndrome patients reduced the neck disability and forward head posture more than in those patients on which sub-occipital muscle inhibition technique was applied.

Keywords:, Children and adolescent health, Forward head posture, Longitudinal OsteoArticular Decoaptation Stretching (LOADS), Musculoskeletal pain, Technology addiction, Visual analogue scale

Introduction

During the last few years, a growing reporting of data is showing that the “text neck syndrome” might be considered as an emerging 21st-century syndrome. This clinical condition refers to the “onset of cervical spinal degeneration that results from the repeated stress of frequent forward head flexion while we look down at the screens of mobile devices and while we “text” for long periods of time”(2). Text neck syndrome is more common in adolescents, who, for several hours a day and for several days a year, hunch over smartphones and personal computers more frequently than in the past.(3). It is estimated that 75% of the world’s population is hunched over their handheld devices hours daily with their heads flexed forward.

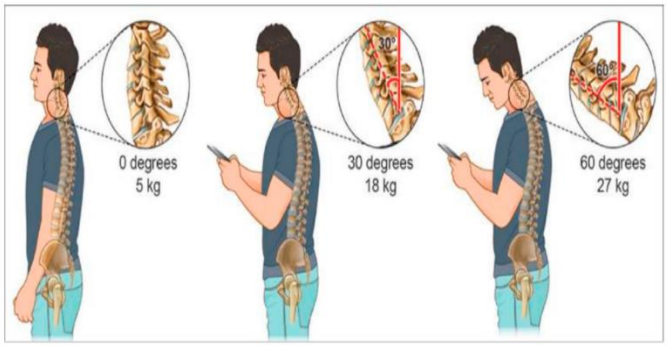

Figure 1. A chart depicting the stress and weight put on the neck and spine as a result of hunching over a smartphone and handheld devices at varying degrees. The neck flexion angle is the angle between the global vertical and the vector pointing from C7 to the occipito-cervical joint. A full-grown head weighs 5 kg in the neutral position. As the head bends forward, the weight seen by the neck increases to 18 kg at 30° and 27 kg at 60°. Reprinted with permission from ref. [(4)]. Copyright 2017 Surgical Neurology International.

Text neck refers to the degeneration of the cervical spine resulting from the repetitive stress of prolonged forward head flexion while looking down at mobile screens (5). If left insufficiently treated, the text neck can worsen over time, causing a multitude of physical health problems such as cervical curvature alteration, neck and shoulder muscle strain, impaired neck muscle perception, posterior ligamentous injury, and entrapment neuropathies (6)

Disorders associated with flexed head posture include cervicogenic headaches (7), cervicogenic dizziness and cervical radiculopathy (8). Most of these conditions manifest with clusters of painful symptoms and spine dysfunctions.

The upper cross syndrome that is present in FHP, muscular tightness is one of its common problem. The FHP is portrayed by hyperextension of the upper cervical (C1-C2) and flexion of lower C-spine (C3-C7). This abnormal position is most often kept up by patients in reaction to a wrong posture, causing a deep structural as well as functional influence on the different areas of body(9)
Conservative treatment of text neck syndrome includes medication, physiotherapy, acupuncture and local anesthetic injections (4).

Elongation Longitudinaux Avec Decoaption Osteo Articulaire (ELDOA) or Longitudinal Osteo-Articular Decoaptation Stretching (LOADS) in English, is a manual physical therapy tool and myofascial stretch technique designed to produce active decompression by creating a space in the targeted area and causes realignment of the structure by correcting fascial tension. Locally, ELDOA improves muscle tone for posture correction and generally, improves the kinetic sense of the myofascial chain and causes normalization of tension in the myofascial system (10), ELDOA facilitates local proprioception of the targeted segment which improves orientation perception, thereby enhancing the capability to self-correct any postural discrepancy. This general effect of ELDOA, person gets the awareness to self-correct abnormal posture (11).

The suboccipital muscle inhibition (SMI) technique relaxes the tension in the muscles located between the axis and occiput, which regulates the upper cervical vertebra. The suboccipital muscle inhibition technique is a manual technique that aims to relax the tension in the suboccipital muscles by decreasing the myofascial restriction in the suboccipital region (12). In SMI technique, patient lies comfortably in supine lying and can be easily administered by the therapist inducing relaxation of the fascia by applying pressure softly to the suboccipital area (13).

Therapeutic exercise, in the form of neuromuscular retraining and enhancement, is one of the most important therapeutic interventions for the treatment of neck pain(14). The evaluation of mobility is an important part of a physical examination. In order to choose effective physical therapy methods, a thorough examination of joint integrity and mobility is required. Clinicians may be able to make diagnoses, measure improvements or deteriorations in mobility, and determine functional constraints by recognizing impairments in joint mobility. As a result, in order to objectively evaluate illness development, outcomes, and mobility impairments, therapists must have accurate and valid assessment instruments. Inclinometry is a method of assessing joint mobility that uses constant gravity as a reference point (15).

Literature review

Research consisting of 44 males and females patients aged 30-40 years, with the diagnosis of forward head posture also called as text neck syndrome was conducted. The study design was quasi experimental. All the patients received three sessions per week for 4 weeks after selection through convenience sampling technique. The assessment was done at baseline, first, fourth and twelveth post treatment day. The finding revealed that ELDOA exercises were found to be effective in the correction of forward head posture.(16)

In 2016 a study was conducted to observe the effect of suboccipital muscle inhibition technique (SMI) to correct craniocervical posture. A randomized, single blinded clinical study with a sample of 24 patients that were divided into

experimental (n=12) who underwent SMI and sham group (n=12) who underwent a sham (placebo) intervention was done. The effect size is large in SMI group.(17)

Material and Methodology

Study Design: Randomized control trial, this trial has been registered in Iranian registry of clinical trials by the id no: IRCT20210811052138N6

Sample Size: 44 (16)

Sampling technique: Convenient sampling

Duration of study: 6 months

Setting: People of Faisalabad.

Selection criteria

Inclusion criteria

- Aged 24 to 40 years
- History of chronic neck pain (for at least 3 months) pain > 3NRS
- Palpable taut bands in skeletal muscles
- Reduced cervical ROMs of flexion(<80 deg), extension(<70deg), BS rotation(<90deg), lateral flexion(<20deg)
- Developing kyphosis
- Proper understanding of patient to perform test: tragus to wall test >5cm

(16)

Exclusion criteria

- Surgery of spine or any extremity
- Cervical osteoporosis
- Cervical radiculopathy
- Spinal or UE infection
- Malignancy of upper extremity or thorax
- Obesity
- Trauma or bony deformity of UE
- dizziness

(16)

Measurement tools

- Numeric Pain Rating Scale.

- Neck disability index.
- Inclinometer.
- Tragus to wall distance test.

Data collection procedure

This study is a Randomized control trial. 44 participants are randomly allocated to group A and group B which meet the selection criteria from the people of Faisalabad. Participants signed a consent form before entering the study. Data is collected through coin tossing technique. Group A (n=22) received ELDOA and baseline treatment and group B (n=22) received sub-occipital muscle inhibition and baseline treatment, the baseline treatment includes hot pack. Data is analyzed by SPSS version – 16

FITT	Group A	Group B
Frequency	3 times/ week	3 times/ week
Intensity	Hot pack: 7 min ELDOA: 4 ELDOA positions, one minute for each position	Sub-occipital Muscle inhibition technique: Apply 15 to 20 sec 3-4 reps Hot pack: 10 min TENS: 15 min Isometrics: 5 min
Time	20-25 mins/ session	30 mins/ session

Results

Demographic Data

40 Active participants were enrolled in the study. All participants filled the questionnaire and there was no drop out in this study. Subjects participated in the study fulfilled all the parameters.

Test of Normality

Tests of Normality (Shapiro-Wilk)				
Variables	**Groups**	**Statistic**	**df**	**Sig.**
Flexion	ELDOA	0.9393	20	0.055
	Sub occipital Muscle Inhibition	0.906	20	0.053
Extension	ELDOA	0.9684	20	0.0621
	Sub occipital Muscle Inhibition	0.9157	20	0.0819
Bilateral flexion	ELDOA	0.9358	20	0.6281

	Sub occipital Muscle Inhibition	0.9233	20	0.0527
Bilateral rotation	ELDOA	0.9343	20	0.1868
	Sub occipital Muscle Inhibition	0.9257	20	0.1384
VAS	ELDOA	0.9946	20	0.0719
	Sub occipital Muscle Inhibition	0.9111	20	0.066
Tragus to wall test	ELDOA	0.9392	20	0.2316
	Sub occipital Muscle Inhibition	0.9636	20	0.6173
NDI	ELDOA	0.9344	20	0.1877
	Sub occipital Muscle Inhibition	0.9305	20	0.1581

The Shapiro-Wilk test of normality was used to check the normality of data distribution. This table shows the statistics, degree of freedom and p value of the baseline variables. The table shows the p value to be more than 0.05 which indicates that the data is normally distributed. For a normally distributed data two parametric tests are used for statistical analysis. These are the independent t test for between group analysis and paired t test for between group analyses.

Independent T Test

Outcome Measure	**Treatment Groups**						**T**	**P value**
	ELDOA Group			**Sub Occipital Group**				
	N	**Mean**	**SD**	**N**	**Mean**	**SD**		
Flexion at baseline	20	47.2	±7.28	20	48.35	±10	0.398	0.7027
Flexion after Treatment	20	51.2	±6.97	20	49.7	±9.52	-0.549	0.05985
Extension at baseline	20	47.5	±15	20	40.15	±14	-1.957	0.0717
Extension after Treatment	20	50.85	±15.8	20	42.05	±14.5	-2.175	0.0474
Bilateral flexion at baseline	20	16.9	±1.67	20	16.55	±1.77	-0.678	0.5166
Bilateral flexion after Treatment	20	20.45	±2.38	20	18.05	±1.83	-4.332	0.0005
Bilateral rotation at baseline	20	57.8	±8.44	20	61.75	±8.1	1.614	0.1321
Bilateral rotation after Treatment	20	62.45	±8.07	20	63.75	±7.82	0.508	0.06264
VAS at baseline	20	7.65	±1.11	20	7.25	±1.18	-1.284	0.2258
VAS after Treatment	20	2.9	±0.77	20	5.25	±1.22	6.745	0.0000
Tragus to wall distance at baseline	20	15.96	±0.35	20	15.91	±0.37	-0.464	0.6564
Tragus to wall distance after Treatment	20	15.35	±0.26	20	15.7	±0.42	3.193	0.0057

NDI at baseline	20	35.5	±9.04	20	35.75	±8.64	0.109	0.9165
NDI after Treatment	20	19.6	±6.36	20	27.1	±7.99	3.405	0.0036

(Between Groups Analysis)

Independent t test was applied for comparison of variables between groups before and after treatment. This table shows that there were non-significant differences between variables of both groups at baseline. Independent t test has shown that ELDOA technique has produced significant improvement in cervical flexion ranges, reduction of pain and neck disability as compared to sub occipital muscle inhibition technique.

Discussion

The aim of this study was to compare the effects of ELDOA technique and Sub-occipital muscle inhibition technique on pain and disability in patients with Text Next Syndrome.The experimental group showed more decrease in pain as compared to the control group which depicts that ELDOA technique is an effective intervention for treating pain and neck disability

In adults with a forward head position, the effects of prolonged smartphone use on muscle causes fatigue and pain in the neck and shoulders and vice versa. Forward head posture can be caused by a variety of factors, including poor ergonomics, prolonged computer or smartphone use, and muscular imbalances.

The ELDOA stretch has been used to improve the posture and to manage pain over cervical and lumber spine. It has also been used to enhance flexibility and range of motion of hamstring and piriformis muscle. Literature supports its effectiveness over the above lumber areas however a systemic review is lacking on the subject of ELDOA stretch over cervical spine to treat text neck syndrome. Similarly a not much systemic meta-analysis has done using suboccipital muscle inhibition technique to treat text neck syndrome.

Taking Suboccipital muscle inhibition technique into consideration, It can provide temporary relief, addressing the underlying causes and making lifestyle changes are crucial for long-term improvement.

There has been no work carried out to compare the effects of ELDOA technique and suboccipital muscle inhibition technique. Thereby, the current study is designed to compare sub-occipital therapy with ELDOA exercises as a method of recovery for text neck syndrome.

The purpose of study was to evaluate the short and intermediate term effects of ELDOA technique and SIM technique on pain and disability associated with forward head posture.

The future scope of this study is that it can be done with long term follow up and longer treatment duration, the study can be revised involving a larger sample size, individuals of elder age group could be studied and further studies can be taken up with different intervention procedures and parameters for improving cervical curvature and muscular strength

Conclusion:

The results of pain in Group A on which ELDOA technique was performed had more significance than Group B on which sub-occipital muscle inhibition technique was applied because the mean of group A for pain intensity dropped from 7.65 to 2.90 and that of group B dropped from7.25 to 5.25. The mean difference of pain intensity in group A was 4.75 and that in group B was 2.0.This interpretation showed that the ELDOA technique proved to be more effective exercise than the sub-occipital technique. So the ELDOA technique when applied in text neck syndrome patients reduced the neck disability and forward head posture more than in those patients on which sub-occipital muscle inhibition technique was applied.

During the comparison it has been noted that no man or woman was harmed. Participants have been knowledgeable about the cause of the research. Informed consent legal guidelines have been carried out by means of the usage of the inquiry. In the study, full confidentiality of member files used to be retained and their character, person data, conversation have been guaranteed.

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Conflict of interest: None

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