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Effect of Soft Tissue Mobilization on Cervical Pain in Nursing Women

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Abstract

Introduction: *cervical pain in nursing women is aserious health problem because it certainly limits function and capacity in both work and personal life.* ***Purpose:*** *This study was performed to determine the effectiveness of soft tissue mobilization on the treatment of cervical pain in nursing women.* ***Subjects:*** *sixty breastfeeding women were selected from Fakous Hospital at El Sharqia, diagnosed with neck pain and active myofascial trigger points (MTrPs) in the upper fibres of trapezius muscle. Patients were divided randomly into two groups equal in number: group (A) received convential physical therapy (stretching exercise), group (B) received instrument assisted soft tissue mobilization (IASTM) and convential physical therapy.* ***Methods:*** *The Visual Analogue Scale (VAS) and Neck disability index scale (NDI) were assessed before the study and after four weeks.* ***Results:*** *The mean difference in VAS between groups post treatment was 1.6. There was a significant decrease in VAS of group B compared with that of group A post treatment. The mean difference in NDI between groups post treatment was 5.4%. There was a significant decrease in the NDI of group B compared with that of group A post treatment.* ***Conclusion:*** *soft tissue mobilization can be used on the treatment of cervical pain in nursing women. It has significant effect on Visual Analogue Scale and Neck disability index scale rather than convential physical therapy only.*

Keywords: *Active MTrPs, IASTM, Visual Analogue Scale, Neck disability index scale*

1. Introduction

Breastfeeding is a beneficial procedure for both physical and mental health of mothers and children. Mothers adapt a supportive position while nursing babies so that they latch on easily in addition to provide better control of breasts to allow free flow of milk **[1].**

It was showed that the most common position was cross cradle hold was associated with mechanical neck pain. By adopting this position mothers were more comfortable and this position also showed association with mechanical neck pain due to improper posture of mothers **[2].**

During breastfeeding, wrong position and placement of hands to support baby's weight cause irritation of musculatures of hand. Then the use of the same position again and again causes radiating pain in elbow and hands. Adopting different postures to compensate pain in sitting causes mechanical change in cervical, thoracic and lumbar spine that alters the correct posture of the body **[3].**

Nursing mothers reported BF position-related musculoskeletal pains across various body segments (back, neck and upper limb joints), with the neck and shoulder identified as the commonest affected body regions **[4].**

Myofascial trigger points (MTrPs) are thought to be acommon source of musculoskeletal pain and impairment. MTrPs are characterized as discrete foci, often palpable as a nodule, within taut bands of skeletal muscle that are tender upon palpation and produce characteristic referred pain and autonomic phenomena. The sub occipitalis, sternocleidomastoid, splenius capitis and upper trapezius muscles most commonly harbor the trigger points primarily responsible for neck and head pain **[5].**

MTrPs may develop from repetitive microtrauma to muscle fibres. This causes the muscle to be under continuous stress. When repetitive microtrauma is combined with predisposing factors such as bad posture, the trigger points are activated **[6].**

Treatment of this condition included pharmacotherapy and Physical therapy. Pharmacotherapy included non-steroidal anti-inflammatory drugs, botulinium toxin injections, anticonvulsants and muscle relaxants. The physical therapy program for myofascial pain and trigger points could Include stretching exercise, ultrasound, massage, kinesiology taping, trigger point release, dry needling, laser and High-power pain threshold ultrasound **[7].**

Stretching cervical muscles involved in chronic myofascial pain syndrome for 30s was optimal in achieving stretching benefits and minimizing the negative effects on the neural function of the involved nerve roots and central nervous system **[8].**

Instrument assisted soft tissue mobilization (IASTM) is a popular treatment for myofascial restriction. IASTM enhances fibroblast proliferation, increases vascular response, decreases scar tissue and adhesions and remodes the disordered collagen fiber matrix. Additionally, it had been demonstrated that the IASTM technique resulted in clinical benefits like the increased range of motion, perception of pain following treatment and strength **[9].**

Breastfeeding was the most common daily living activity that caused NSP to become worse. This pain by time has negative effect on women daily life. Early treatment and advices can alter this mechanism **[10].** This study was conducted to determine the effectiveness of soft tissue mobilization on cervical pain in nursing women.

2. Materials and Methods

This This current study was designed to determine the effectiveness of soft tissue mobilization on cervical pain in nursing women**.**

Subjects

Sixty breastfeeding women were selected from Fakous Hospital at El Sharqia. They were diagnosed with neck pain and active MTrPs in the upper fibers of trapezius muscle. The study was performed in six months from August 2022 to January 2023.

The patient's age ranged from 20 to 35 yrs. Their BMI ranged from 20 to 30 kg/m². The participants were excluded if they were with BMI higher than 30 kg/m^2, they had skin disorder, non-breastfeeding females, suffering from cervical disc hernia, advanced cervical osteoarthritis, radiculopathy or myelopathy, having arheumatologic disease or ahormonal disease or having a cardiovascular problem.

Patients were divided randomly into two groups equal in number .Group (A) Control group contained thirty participants and received convential physical therapy (stretching exercise) for four weeks. Self-stretching exercise were maintained for 30s and repeated three times with resting period lasting 30s, repeated twice a week for four weeks. Group (B) Study group contained thirty participants and received IASTM and convential physical therapy for four weeks. IASTM was applied for 3 min, repeated twice a week for four weeks .

Each woman in both groups (A&B) was assessed through assessing pain intensity using visual analogue scale and degree of neck disability using neck disability index before and after treatment program. This study was performed under the ethical committee No: P.T.REC/012/003869, Faculty of Physical Therapy, Cairo University.

Evaluation instrumentations and procedures

Informed consent form:

All women in both groups were asked for consent after a detailed explanation about aims, benefits and risks of the study and also, they had acknowledged that they could freely withdraw from the study at any time according to their will.

Data collecting sheet
Every patient was asked about (name, age, address, mobile number, occupation, parity, chief complaint, type of delivery, special habits, number of children she had, medical history, number of delivery and type of delivery) and recorded in data collecting sheet.

Visual analogue scale (VAS)
The VAS is aself-reported pain measurement, awidely utilized pain intensity assessment instrument scale in rehabilitation that had been shown to be valid and reliable. Consisting of ahorizontal or vertical line, usually 10 cm long. The extremes of the line are labelled as no pain and worst pain **[11].**

Neck disability index scale
The NDI is a ten-item condition specific functional status questionnaire filled by patients such as personal care, pain, reading, lifting, concentration, headaches, work, driving, sleeping and recreation. Each item is scored from zero (no disability) to five (total disability) with the maximum possible total score being 50 **[12].**

For each item, the woman was asked to choose one answer that best defined her neck function. Scores for each item were tallied and the total score was recorded. Atotal score of 0-4 indicates no disability, ascore of 5-14 indicates mild disability, ascore of 15-24 indicates moderate disability, ascore of 25-34 indicates severe disability and ascore of 35 or greater indicates complete disability **[13].**

Treatment instrumentations and procedures
Control group (A) convential physical therapy group that received active stretching exercise.
1.The participant set in a comfortable position.
2.Using Self stretching technique.
3.Patients were asked to sit upright on a chair and look straight ahead.
4.Patients then were asked to perform contralateral lateral bending using the opposite hand on the frontal plane horizontally. stretching positions were maintained for 30s and repeated three times **(Figure 1).**
5.A resting period lasting 30s was given in between each session **[8].**

Figure (1): Stretching exercises

Study Group (B) the study group that received IASTM and convential physical therapy.
For IASTM
1.The participant seated in acomfortable position.
2.The participant's forehead rested on her forearm on atable in front of her.

3.Alubricant (Vaseline) was applied to the skin around the neck area prior to treatment.
4.the M2T blade was cleaned with an alcohol pad.
5.First, the M2T blade was used to find the exact areas of restriction in the upper trapezius.
6.Then the M2T blade was used at an angle of 45 to apply slow strokes along the muscle without causing any discomfort or pain, from the muscle origin to its insertion (sweeping technique), for approximately 3 min. **(Figure 2,3).**
7.This procedure was repeated twice a week for four weeks **[14] [15].**

Figure (2): M2T blade.

Figure (3): M2T Blade application.

Statistical (Data) analysis
Unpaired t test was conducted for comparison of age, weight, height and BMI between groups. Mixed MANOVA was conducted to compare the effect of time (pre versus post) and the effect of treatment (between groups), as well as the interaction between time and treatment on mean values of VAS and NDI. Post-hoc tests using the Bonferroni correction were carried out for subsequent multiple comparison. The level of significance for all statistical tests was set at $p < 0.05$. Statistical analysis was performed through the statistical package for social studies (SPSS) version 25 for windows.

3. Results
General characteristics of the patients
Sixty nursing women with cervical pain participated in this study. Subjects were divided into two groups, thirty in each group. Group A: Thirty nursing women with cervical pain were included in this group. Their mean ± SD age, weight, height and BMI were 28.53 ± 3.38 years, 68 ± 5.82 kg, 161.26 ± 4.47 cm and 26.15 ± 2.07 kg/m². Group B: Thirty nursing women with cervical pain were included in this group. Their mean ± SD age, weight, height and BMI were 27.76 ± 3.43 years, 68.16 ± 6.29 kg, 161.63 ± 4.56 cm and 26.08 ± 2.06 kg/m² respectively.

Table (1) showed the subject characteristics of group A and B. There was no significant difference between groups in age, weight, height and BMI ($p > 0.05$).

Table 1. Comparison of subject characteristics between group A and B:

	Group A	Group B			
	Mean ±SD	**Mean ±SD**	**MD**	**t- value**	**p-value**
Age (years)	28.53 ± 3.38	27.76 ± 3.43	0.77	0.87	0.38
Weight (kg)	68 ± 5.82	68.16 ± 6.29	-0.16	-0.11	0.91
Height (cm)	161.26 ± 4.47	161.63 ± 4.56	-0.37	-0.31	0.75
BMI (kg/m²)	26.15 ± 2.07	26.08 ± 2.06	0.07	0.12	0.9

SD, Standard deviation; MD, Mean difference; p value, Probability value

Effect of treatment on VAS:

Within group comparison

Group A

The mean ± SD value of VAS pretreatment of group A was 6.43 ± 1.04 and that post treatment was 4.03 ± 1.52. The mean difference between pre and post treatment was 2.4 and the percent of change was 37.33%. There was a significant decrease in VAS of group A post treatment compared with pretreatment (p = 0.001).

Group B

The mean ± SD value of VAS pretreatment of group B was 6.66 ± 1.06 and that post treatment was 2.43 ± 1.41. The mean difference between pre and post treatment was 4.23 and the percent of change was 63.51%. There was a significant decrease in VAS of group B post treatment compared with pretreatment (p = 0.001).

Comparison between groups

Pretreatment

The mean difference in VAS between groups pretreatment was -0.23. There was no significant difference in VAS between group A and B pretreatment (p = 0.39). **Table (2)**

Post treatment

The mean difference in VAS between groups post treatment was 1.6. There was a significant decrease in VAS of group B compared with that of group A post treatment (p = 0.001). **Table (2).**

Table 2. *Mean VAS pre and post treatment of group A and B.*

VAS (ms)	Pre-treatment	Post treatment	MD	% of change	P-value	Sig
	$\bar{X}$ **±SD**	$\bar{X}$ **±SD**				
Group A	6.43 ± 1.04	4.03 ± 1.52	2.4	37.33	0.001	**S**
Group B	6.66 ± 1.06	2.43 ± 1.41	4.23	63.51	0.001	**S**
MD	-0.23	1.6				
P-value	0.39	0.001				
Sig	**NS**	**S**				

$\bar{X}$ **: Mean**	**SD: Standard deviation**	**MD: Mean difference**
p value: Probability value	**S: Significant**	**NS: Non-significant**

Effect of treatment on NDI:

Within group comparison

Group A

The mean ± SD value of NDI pretreatment of group A was 23.73 ± 5.83% and that post treatment was 18.5 ± 5.74%. The mean difference between pre and post treatment was 5.23% and the percent of change was 22.04%. There was a significant decrease in NDI of group A post treatment compared with pretreatment (p = 0.001).

Group B

The mean ± SD value of NDI pretreatment of group B was 24.53 ± 4.93% and that post treatment was 13.1 ± 4.35%. The mean difference between pre and post treatment was 11.43% and the percent of change was 46.6%. There was a significant decrease in NDI of group B post treatment compared with pretreatment (p = 0.001).

Comparison between groups

Pretreatment

The mean difference in NDI between groups pretreatment was -0.8%. There was no significant difference in NDI between group A and B pretreatment (p = 0.56) **Table (3).**

Post treatment

The mean difference in NDI between groups post treatment was 5.4%. There was a significant decrease in the NDI of group B compared with that of group A post treatment (p = 0.001). **Table (3).**

Table 3. *Mean NDI pre and post treatment of group A and B.*

NDI (%)	Pre-treatment $\overline{X}$ ±SD	Post treatment $\overline{X}$ ±SD	MD	% of change	P-value	Sig
Group A	23.73 ± 5.83	18.5 ± 5.74	5.23	22.04	0.001	**S**
Group B	24.53 ± 4.93	13.1 ± 4.35	11.43	46.60	0.001	**S**
MD	-0.8	5.4				
P-value	0.56	0.001				
Sig	**NS**	**S**				

$\overline{X}$ **: Mean**	**SD: Standard deviation**	**MD: Mean difference**
p value: Probability value	**S: Significant**	**NS: Non significant**

Effect of treatment on VAS and NDI:

Mixed MANOVA revealed a significant interaction effect of treatment and time (F = 32.68, p = 0.001). There was a significant main effect of treatment (F = 3.36, p = 0.04). There was a significant main effect time (F = 273.38, p = 0.001).

Within group comparison

There was a significant decrease in VAS and NDI post treatment in both groups compared with that pretreatment ($p < 0.001$). The percent of change in VAS and NDI of group A was 37.33 and 22.04% respectively and that in group B was 63.51 and 46.6% respectively **(Table 4).**

Between group comparison

There was no significant difference between groups pretreatment ($p > 0.05$). Comparison between groups post treatment revealed a significant decrease in VAS and NDI of group B compared with that of group A ($p < 0.001$) **(Table 4, figure 4).**

Table 4. Mean VAS and NDI pre and post treatment of group A and B:

	Pre-treatment Mean ±SD	Post treatment Mean ±SD	MD	% of change	p value
VAS					
Group A	6.43 ± 1.04	4.03 ± 1.52	2.4	37.33	0.001
Group B	6.66 ± 1.06	2.43 ± 1.41	4.23	63.51	0.001
MD	-0.23	1.6			
	p = 0.39	***p = 0.001***			
NDI (%)					
Group A	23.73 ± 5.83	18.5 ± 5.74	5.23	22.04	0.001
Group B	24.53 ± 4.93	13.1 ± 4.35	11.43	46.60	0.001
MD	-0.8	5.4			
	p = 0.56	***p = 0.001***			

SD, Standard deviation; MD, Mean difference; p value, Probability value

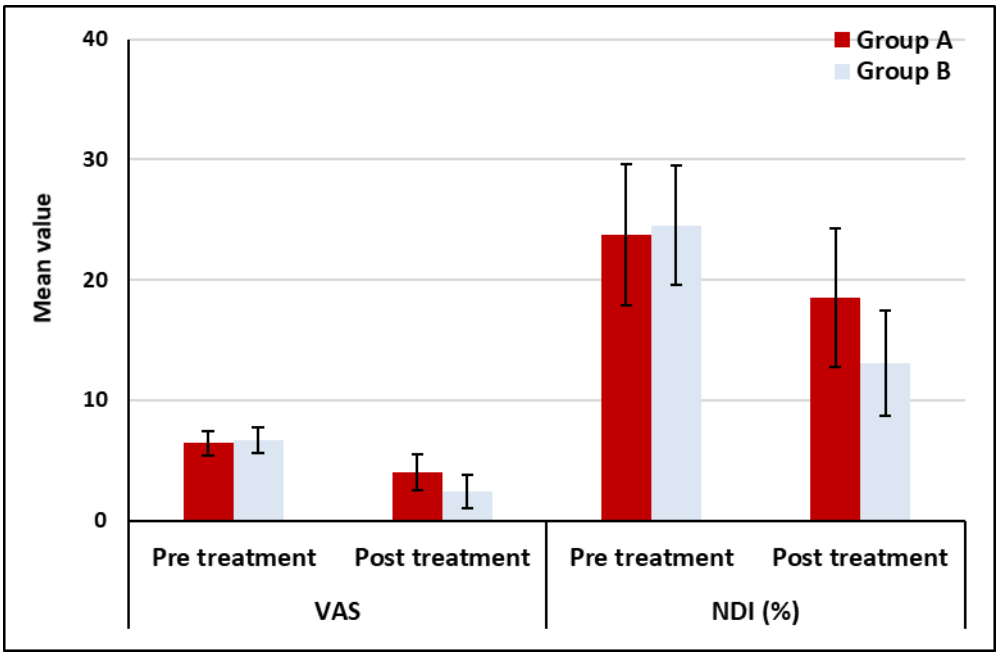

Figure (4). Mean VAS and NDI pre and post treatment of group A and B

4. DISCUSSION

Limited solutions are available to relieve neck pain in nursing women. Position-related neck pain had been identified as the commonest disorder in more recent studies. The biomechanical implications of the commonly utilized BF positions relative to the incidence of BFRNP and other musculoskeletal disorders are very important. Such knowledge will guide BF practices among nursing mothers as well as recommendations for BF position modifications in clinical settings **Rani et al., 2019 [1].** Therefore, the current study was performed to determine the effectiveness of soft tissue mobilization on the treatment of cervical pain in nursing women. Sixty breastfeeding women were selected from Fakous Hospital at El Sharqia. Their age ranged from 20-35 years old. They were diagnosed with neck pain and active MTrPs in the upper fibers of trapezius muscle.

Patients were divided randomly into two groups equal in number: Group (A) control group contained thirty participants and received convential physical therapy (stretching exercise). Group (B) study group contained thirty participants and received IASTM and convential physical therapy. The Visual Analogue Scale and Neck disability index scale were assessed before the study and after four weeks of treatment.

The results of the study revealed that soft tissue mobilization had significant effect on Visual Analogue Scale and Neck disability index scale on the treatment of cervical pain in nursing women. Using soft tissue mobilization with convential physical therapy had more significant effect rather than convential physical therapy only.

The results of the current study were supported by study done by **Dalal P. and Kage, 2020 [16]** who said that both upper trapezius stretching methods in MTP and LTP were effective for increasing the reduced ROM for neck rotation in patients with neck pain.

The results of the study were agreed with **Fousekis et al., 2016 [17]** who confirmed that IASTM technique resulted in clinical benefits like the increased range of motion, perception of pain following treatment and strength. The results of the study were agreed with **Gulick, 2018 [15]** who found that IASTM using shown favourable results with improving posterior shoulder range of motion, hip and knee ROM and ankle ROM.

Abdelhamid et al., 2020 [18] confirmed that IASTM using M2t blade and TPR were effective in treating patients with mechanical neck pain and UT MTrPs. The results of the study were agreed with

OLIVEIRA et al., 2013 [19] who confirmed that IASTM using M2t blade showed significant effects in decreasing pain level, increasing functional level, PPT and range of motion.

The results of the current study were supported by study done by **El-hafez et al., 2020 [14]** that IASTM and SM are effective methods for improving pain and function in patients with upper trapezius trigger points. In agreement with **Gehlsen et al., 1999 [20]** who proved that IASTM resulted in the regional inflammatory process and increased the release of fibroblast. The fibroblast migration increased collagen synthesis and tissues regeneration that speed up the healing process.

Baker et al., 2013 [21] confirmed that IASTM could decrease pain as it increases tissue temperature and blood flow due to friction between tool and tissue might contribute to improve tissue oxygenation and removal of local waste metabolites. These results were in line with **Motimath et al., 2017 [22]** who concluded that IASTM technique by using M2T blade is auseful tool that can decrease pain immediately in subjects with upper trapezius spasm.

Bulbuli et al., 2017 [23] proved that M2T blade found reduction in pain level and increased activity level and they explained that M2T blade can be used to soften tight fascia by applying rhythmic strokes over the fascia till the adhesions and cross-linkages are broken and the release of the fascia occurred. In agreement with **Naik et al., 2016 [24]** who applied M2T on subjects with shoulder pain and they found significant pain reduction post-treatment.

In agreement with **Markovic et al., 2015 [25]** who proved that the IASTM group maintained more joint ROM and favourable outcomes were found. The result of the current study was supported by study done by **Naik et al., 2017 [26]** that the blade was very effective on reducing pain. applying M2T lead to stretch the restricted fascia so, removing compression on pain nerve fibers and increasing joint mobility.

In agreement with **Weerapong et al., 2004 [27]** who found that Stretching exercise also can relax the spasmed muscle. The stretching exercise worked on viscoelastic properties of muscle fibers and inducing relaxation. As when applying constant external load slowly on shortened muscle, this leads to deformation and increasing flexibility of the target muscle. The result of the study was contradicted with **Cheatham et al., 2019 [28]** who had demonstrated that IASTM had no significant effects on muscle performance. The result of the study was contradicted with **Vardiman et al., 2015 [29]** who proved that using IASTM is a subjective measure as pain and ability to perform activities of daily living decreased immediately following IATSM.

The result of the study was not supported by **Cheatham et al., 2016 [30]** who found that the efficacy of IASTM for treating certain musculoskeletal pathologys. The current evidence seems to lack the methodological rigours necessary to validate the efficacy of IASTM itself or any of the IASTM protocols.

5. Conclusion

Accordingly, it can be concluded that Soft tissue mobilization has significant effect on Visual Analogue Scale and Neck disability index scale in the treatment of cervical pain in nursing women. using soft tissue mobilization with convential physical therapy has more significant effect rather than convential physical therapy only.

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