

Effects of Kinesiotax Taping Over Posterior Neck Muscles on Pain and Functional Disability in patients with Mechanical Neck Pain

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ABSTRACT

Objective: To determine the effects of kinesiotax taping over posterior neck muscles on pain, functional disability and range of motion in patients with mechanical neck pain

Methodology: A quasi experimental study was conducted on population aged between 30 to 40 years and 36 people were selected via Consecutive sampling technique. Study was conducted in Physiotherapy OPD, Services hospital, Lahore. Numeric Pain Rating Scale (NPRS) and Neck Disability Index (NDI) were used as outcome measure.

Results: There was significant improvement in pain alleviation as pretreatment mean of NPRS was 6.55±0.33 and post treatment mean at 4 weeks was 3.88±0.21 while pretreatment mean of NDI was 42.33±2.92 and post treatment mean at 4 weeks was 15.05±1.56 in experimental group.

Conclusion: The study concluded that kinesiotaping combined with stretching exercise program is more effective in decreasing pain and disability than stretching exercises alone in patients with mechanical neck pain.

Key words: Kinesio tape, Neck pain, Disability

INTRODUCTION

Mechanical neck pain is localized pain over cervical, occipital and scapular area that does not spread to the shoulders(1). Mostly it is idiopathic in origin(2) but also caused by prolonged neck postures during computer use, overuse injuries and trauma. Prevalence of mechanical neck pain range is 16.7%-75.1%(3). Females are more affected by neck pain. Mechanical neck pain results in decreased neck movement, functional impairment, decrease in muscle strength and overall decline in quality of life that leads to the work related absence(4). Manual therapy includes mobilization, relaxation exercises, and therapeutic exercises, found very effective in improving pain and returning back to work. Combined treatment including postural training, manual therapy and routine treatment, were very effective in decreasing pain, increasing neck mobility and enhancing patient satisfaction by returning back to work(5).

Kinesiotax taping (KT) is a kind of kinesthetic tape usually used in clinical practice which seems to have the thickness and resilience of the skin. Kinesiotax taping is a new treatment intervention that is used as an adjunct to the conventional exercise program. Dr kenzo kase, inventor of kinesiotax tape presented the effects of tape as: improved muscle function, increase blood and lymph circulation, giving positional stimulus to skin, muscle and fascia, decrease local edema(6).

Kinesiotax taping is used for many conditions such as shoulder pain, sports injuries, plantar fasciitis, low back pain and neck pain. Many researchers have confirmed the use of kinesiotax taping in reducing pain, improving neck range of motion and muscle function(7). Kinesiotax taping is beneficial in restoring positional effect in the skin, it produces space between skin and interstitial space that increases the blood and lymphatic flow and facilitate and inhibit movement(8, 9).

Some studies showed the effect of kinesiotax taping on forward head posture (FHP) and deep neck flexors(10, 11). Researchers have shown that combined treatment is more useful in neck pain than conventional exercises alone. Kinesiotax taping is also an effective treatment to enhance muscle strength without restricting range of motion by decreasing undesired tension on muscle and fascia thus reducing pain and correcting muscle function(12, 13).

Kinesiotax taping is new technique in the treatment of musculoskeletal pain. More research is needed to investigate the effects such as positional effect, facilitatory and inhibitory effect on movement, edema control and improve blood flow in

patients of mechanical neck pain(14). So, the rationale of this research is to find the additive effects of kinesiotax taping regarding site, tension, duration of application with conventional exercise program on pain, functional disability and range of motion in patients with mechanical neck pain.

METHODOLOGY

A Quasi-experimental trial was carried out in Outpatient Department of Physical Therapy, services hospital, Lahore. Sample size was 36, calculated by online EPITOOL sample size calculator. Both males and females with age range of 30-40 years having pain anywhere in cervical spine from superior nuchal line to the first thoracic spinous process for duration of less than one month, Patients presented with complaint of mechanical neck pain for no less than one month duration and neck pain without radicular symptoms i.e. radiating to head, chin and upper limbs were included. While patients with history of whiplash injury, previous cervical spine surgery, cervical myelopathy, Contraindication to neck manipulation (e.g., fracture, osteoporosis, positive extension- rotation test, any symptom of vertebrobasilar insufficiency) and allergy to Kinesio tape applications were excluded. Numeric pain rating scale (NPRS) and Neck disability index (NDI) tools were used as outcome measure. During 1st visit of the patients a complete physical examination, History and thoroughly assessment were done by researcher using NPRS and NDI as subjective measurements. Treatment was then continued to the selected subject according to their allocation group. The recruited patients were divided into two groups; Experimental Group (KT along with stretching exercises) and Control Group (Stretching exercises alone). The experimental group received stretching exercises of Levator scapulae, Upper trapezius, sternocleidomastoid and scalene muscles along with KT. Each muscle was stretched for 30s followed by 30s relaxation with 3 repetitions. The control group received stretching exercises alone. All the patients in both groups received ultrasound therapy directly over posterior aspect of neck encompassing mainly upper trapezius muscle with continuous mode for 10 mins per session with intensity of 1.2W/cm² and frequency 1MHz and moist heat therapy for the duration of 15 minutes as standard baseline treatment. The Kinesio tape that was used in this study was waterproof, porous and adhesive with 5cm width and 0.5 cm thickness. The subjects were asked to sit for tape application. Posterior aspect of neck was cleaned and exposed. The first strip was 15cm Y- shaped strip apply on the posterior aspect of neck

from base of neck to upper cervical region with 12-25% stretch. Y shaped strip was applied with the subject's neck in opposite side bending and rotation. Second I shaped 10 cm strip was applied at right angle to the Y strip at the level of C3-C6. The tape was replaced after 3 days. Three session of treatment per week were given to the patients for the period of four weeks. Three readings were taken; first pretreatment reading, second post treatment reading after two weeks and last reading after four weeks post treatment. At the end of each session post treatment evaluation through NPRS and NDI was done. Data was analyzed on SPSS 21. Frequency tables were used to show summary of group measurements measured over time. Repeated Measure ANOVA was used to show change of subjective as well as objective measurement over time. Difference between groups was assessed by Mix model ANOVA.

RESULTS

Total 36 patients were recruited for this study. 18 participants were allocated to experimental and control group each. There were 27.8% (n=5) males in experimental group and females were 72.2% (n=13). In control group, males were 55.6% (n=10) and females were 44.4% (n=8). Mean age of patients in experimental group was 34.72±4.02 while mean age of patients in control group was 35.83±3.76. Mean BMI was 24.94±5.18 kg/m² vs. 27.03±5.05 kg/m² for experimental vs. control group as shown in Table-I.

Table-II and III showed that there was statistically

significant difference between two groups in NPRS score (p value<0.05). NPRS value decreased in experimental group with mean value 3.88±0.21 in contrast to control group with mean 5.27±0.17. Likewise mean NDI score of experimental group decreased from 42.33 to 15.05 while in control group the score decreased from 38.72 to 32.55. Across the group comparison for NPRS was 4.58±0.13. Repeated measure ANOVA was applied to find the statistical significance of Neck disability Index at pretreatment and post treatment 2 and 4 weeks. There was greater reduction in Neck disability Index value 15.05±1.56 in experimental group as compared to control group 32.55±3.05 (pvalue<0.05).

Table-I: Demographic characteristics of participants

Variable	Experimental group (KT along with Stretching exercises)	Control group (Stretching exercises alone)
Gender	N (%)	N (%)
Male	5 (27.8%)	10 (55.6%)
Female	13 (72.2%)	8 (44.4%)
Total	18 (100%)	18 (100%)
Mean±S.D		
Age (year)	34.72 ±4.02	35.83±3.76
Height (Meter)	1.67±0.09	1.67±0.09
Weight (Kg)	69.11±10.91	74.72±9.76
BMI (kg/m ²)	24.94±5.18	27.03±5.05

Table-II: Within group comparison of NPRS and NDI

NPRS	Experimental group (KT along with Stretching exercises)		Control group (Stretching exercises alone)	
Pretreatment NPRS	6.55		6.55	
Post treatment-I NPRS (at 2 weeks)	5.05		5.61	
Post treatment-II NPRS (at 4 weeks)	3.88		5.27	
	Mean (I-J) difference	P value	Mean (I-J) difference	P value
Pretreatment NPRS – Post treatment-I NPRS (at 2 weeks)	1.50	<0.05	0.94	<0.05
Post treatment I NPRS (at 2 weeks)- Post treatment II NPRS (at 4 weeks)	1.16	<0.05	0.33	<0.05
Post treatment IINPRS (at 4weeks)- Pretreatment NPRS	2.66	<0.05	1.27	<0.05
NDI				
Pretreatment NDI	42.33		38.72	
Post treatment 1 NDI (at 2 weeks)	25.94		34.33	
Post treatment II NDI (at 4 weeks)	15.05		32.55	
	Mean (I-J) difference	P value	Mean (I-J) difference	P value
Pretreatment NDI – Post treatment 1 NDI (at 2 weeks)	16.38	<0.05	4.38	<0.05
Post treatment 1 NDI(at 2 weeks)- Post treatment II NDI (at 4 weeks)	10.88	<0.05	1.77	<0.05
Post treatment II NDI (at 4 weeks) - Pretreatment NDI	27.27	<0.05	6.16	<0.05

Table-III: Across group comparison of NPRS and NDI

NPRS	Estimated Marginal Mean	Standard Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Pretreatment NPRS	6.55	0.20	6.14	6.96
Post treatment 1 NPRS (at 2 weeks)	5.33	0.20	4.92	5.74
Post treatment II NPRS (at 4 weeks)	4.58	0.13	4.30	4.86
	Mean (I-J) difference		P value	
Pretreatment NPRS – Post treatment 1 NPRS (at 2 weeks)	1.22		<0.05	
Post treatment 1 NPRS(at 2 weeks)- Post treatment II NPRS (at 4 weeks)	0.75		<0.05	
Post treatment II NPRS (at 4 weeks)-Pretreatment NPRS	1.97		<0.05	
NDI	Estimated Marginal Mean	Standard Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Pretreatment NDI	40.52	2.34	35.77	45.28
Post treatment 1 NDI (at 2 weeks)	30.13	1.96	26.14	34.13
Post treatment II NDI(at 4 weeks)	23.80	1.71	20.31	27.29
	Mean (I-J) difference		P value	
Pretreatment NDI – Post treatment 1 NDI (at 2 weeks)	10.38		<0.05	
Post treatment 1 NDI (at 2 weeks)- Post treatment II NDI (at 4 weeks)	6.33		<0.05	
Post treatment II NDI (at 4 weeks) - Pretreatment NDI	16.72		<0.05	

DISCUSSION

Mechanical neck pain is the most usual type in neck-pain disorders. Many studies have described different behavior of neck muscles in patients. Mechanical neck pain is characterized by intermittent pain, restriction of cervical range of motion, decrease in muscle

strength and decline in overall quality of life. It may be caused by trauma, postural dysfunction, overuse injuries and may be of insidious onset. Physical therapy and patient education are considered non-medical treatment of mechanical neck dysfunction. Current study was conducted to determine whether

kinesiotaping along with stretching exercises creates any effect to reduce mechanical neck pain or not.

The current study included total number of 36 patients divided into 2 groups experimental and control group. Patients in experimental group were treated with kinesiotaping along with stretching exercises to treat neck pain. Out of 36 patients, 15 were males whereas 21 were females. 3 sessions were given to each patient for 4 weeks in both groups. Baseline readings of NPRS and NDI were recorded as pre treatment while post treatment readings were recorded after 2 weeks and 4 weeks. Pain and disability were outcome measures of the study. Results of this study had shown that patients with mechanical neck pain confronted statistically remarkable recovery in both groups in pain and functional level. But experimental group revealed appreciable improvement in pain and disability after two and four weeks of kinesiotaping application in contrast to control group.

Existing research findings were supported by a research carried out by Emira M. El Gandy et al on effects of kinesiotaping combined with exercises on pain, functional disability, and cervical range of motion (CROM) for patients with mechanical neck pain in 2019. Sixty patients were included in 2 equal groups. Control group received infrared, stretching and strengthening exercises whereas experimental group received same treatment in addition to kinesiotaping. There was significant decrease in pain with kinesiotaping combined with exercise program after 6 weeks whereas current study exhibited significant results in 4 weeks(4). Mean of NDI at the end of treatment was 15.05 ± 1.56 for the current study as compared to the other study in which it was 19.1 ± 13.13 . According to results, functional status was more improved in this study.

A study emphasized the combined effect of kinesiotaping with exercise supporting the current study. It was conducted to study the effects of cervical kinesiotaping versus cervical traction on mechanical neck dysfunction in 2013. 44 subjects were recruited in 3 groups. One group received kinesiotaping with exercise, second group received cervical traction with exercise and third group received only exercise. Subjects who received kinesiotaping with exercise program and traction with exercise program were effective in reducing pain, disability and range of motion than exercise alone(3). This study supports the current study as both have same sessions and follow up duration (three sessions per week for four weeks) to support combined effects of kinesiotaping with other interventions.

Another study supported the current study conducted by Mohammad F.Ali et al on the effect of kinesiotaping in patients with mechanical neck dysfunction. Two categories were made by 30 patients. Experimental group treated with kinesiotaping with exercise program. Control group received same exercise only. Kinesiotaping along with exercise was beneficial than exercise alone in mechanical neck dysfunction(10). The results of current study are in agreement with this study.

A study was inconsistent with the current study conducted on efficacy of different physiotherapy methods on neck pain. 3 groups were made with 20 subjects in each. One group was treated with exercise only, one with exercise combined with

mobilization and third group was treated with exercise and kinesiotaping. 15 sessions were given to the patients while current study gave significant results in 12 sessions. Equal decrease in pain and disability in all groups ($p > 0.05$) was observed that was against the current study(15).

CONCLUSION

The study concluded that kinesiotaping combined with stretching exercise program is more effective in decreasing pain and disability than stretching exercises alone in patients of mechanical with mechanical neck pain.

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