Research Article

Comparison of Sustained Natural Apophyseal Glides and Maitland Manual Therapy in Non-Specific Neck Pain on Numeric Pain Rating Scale and Neck Disability Index

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Abstract | Incidence of neck pain is increasing day by day due to changed, sedentary, non-ergonomic environment and life style. This becomes the reason of an increased load of human resource and cost. To shed this load of resources and cost, it's essential to sort out means which give real relief to this increasingly significant problem. To compare outcomes of sustained natural apophyseal glides (SNAGs) versus Maitland manual therapy in improving non-specific neck pain. It was a quasi-experimental study design. The study was conducted in Chaudhary Muhammad Akram, Teaching & Research Hospital, Lahore and Suriya Azeem Teaching Hospital, Lahore within six months from June 2015 to December 2015. A total of 75 subjects with non-specific neck pain using non-probability convenience sampling technique who fulfilled the specific inclusion and exclusion criteria were randomly allocated to three groups; group 1 received SNAGs, group 2 Maitland mobilization and group 3 conventional treatment. Baseline, post-intervention and follow up readings were taken through numeric pain rating scale (NPRS) for pain intensity, neck disability index (NDI) for functional status,goniometer for range of motion and manual muscle testing for muscle strength of neck. The subject in each group were given twelve sessions, with three sessions a week. Data were analyzed through statistical package of social sciences (SPSS) 21. The results of each group showed pre-treatment pain intensity for group 1 was 7.04±1.338 that changed to 3.52±0.714 and for group 2 it was changed from 7.52±0.872 to 5.16±0.850 and 7.16±0.943 to 5.12±0.781 for group 3. The NDI score for group 1, 2 and 3 were 31.56±5.560, 25.040±7.086 and 25.560±5.477 that were changed to 13.120±2.759, 16.360±2.899 and 12.600±2.020 respectively. The one way ANOVA test compared mean of three groups and p-value for pain intensity after treatment was p=0.000 and for functional status p=0.000. The study showed that SNAGs mobilization was more effective in the management of non-specific neck pain and also conventional treatment improved functional status of neck than Maitland mobilization.

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Keywords | Sustained apophyseal glide, Neck disability index, Physical therapy, Neck pain

Introduction

Neck pain (NP) is an unpleasant sensory and emotional experience in the neck region connected with genuine or potential tissue harm.[1] Neck pain is one of the common problem in general population. Its prevalence ranges from 10-15% internationally. There is no finding of neck pain prevalence in Pakistan according to present literature. The most common age of neck pain is around 50 years. Women are more affected with neck pain then men. Neck pain is very disabling condition and is a reason of large amount of cost loss. Exact clinical course is not known, but limited range of motion and patient feeling of stiffness may be started with neck pain.[2],[3]

Neck pain is a pain symptom (or syndrome) – not a clinical sign – that covers a variety of neck disorders, for example spinal tumors, spinal infections and fractures.[4][5] Studies regarding interventions of physical and manual therapies show that they mostly comprises of combination of both active and passive components. Firm conclusions haven't been drawn yet although exercises in combination have been effective for the treatment of neck pain. This is because enough studies haven't been conducted and quality of methodology of most trials is rather low. Promising results were found regarding neck pain when a randomized control trial was conducted.[6],[7]

To treat cervicogenic dizziness Mulligan and Maitland techniques are used but little evidence is present to support their use. The randomized controlled trials were conducted to compare the effective, cost placebo effects of these two methods.[8] So, for reduction of pain and increasing productivity SNAGs should be used.[3],[8],[9] The rationale of this study was to find out the comparative efficacy of Mulligan mobilization (SNAGs) and Maitland mobilization for non-specific neck pain.

Methods

It was a quasi-experimental study. It was conducted in the Chaudhary Muhammad Akram, Teaching & Research Hospital, Lahore and Suriya Azeem Teaching Hospital, Lahore. The study was completed within six months after the approval of synopsis from June 2015 to December 2015. The seventy-five patients were included through non-probability convenience sampling using Rao software, an online sample size calculator, keeping confidence level 95%, confidence interval 5% and population size infinite. The patients were invited through word of mouth; pamphlets explaining signs and symptoms of neck pain were circulated nearby offices and placement people at risk for non-specific neck pain. The inclusion criteria were: age between 20 to 40 years independent of gender, initial telephonic or in person screening for confirmation of primary symptoms, pain equal or more than 3 on numeric pain rating scale, decrease range of motion of neck region. the exclusion criteria were: age below 20 or above 40 years, history of surgical procedure of neck, history of other medical diseases, traumatic neck pain or with complaints of radiculopathy.

The patient visited the physical therapy department either by self or referred from orthopedic surgeon. All potential participants of study were screened for following information before random selection such as age, level of pain on numeric pain rating scale, pain location, trigger point and medical history through physical assessment method by an assessor, radiographic measures and physical diagnostic tests like foraminal compression test (spurling's test) (specificity=92%, sensitivity=77%), distraction test (specificity=100%, sensitivity=43%)[10],[15], vertebral artery test (inter-rater reliability=0.90) [16], craniocervical flexion test (sensitivity, specificity unknown).[17],[19]

An informed consent was taken from patient. Each participant underwent through following procedures at baseline measurements: a questionnaire regarding demographic information, numeric pain rating scale for pain measurement, neck disability index for functional disability, goniometer for range of motion (local company) and manual muscle testing (Florence Kendall method)[20] for muscle strength for neck region were employed. The subjects were equally distributed to three groups with use of dice roll method of randomization. The group 1 was provided by sustained natural apophyseal glide (SNAGs) that are another technique with a combination of a sustained facet glide along with active motion, followed by overpressure. The experienced physiotherapist provided the sustained glide while the patients meanwhile perform active movement on command of physiotherapist with 3 sets of 10 repetitions for 20 minutes.[21] The group 2 was provided with Maitland mobilization technique that consisted of posteroanterior (PA) glide at grade I or II applied where pain occurred before the motion barrier and grades III and IV where motion

barrier was encountered before pain. This oscillatory mobilization was performed at a rate of 2-3 oscillations per second and a frequency of 3-4 mobilization of the joint lasting approximately 30 second each. The rest time between each mobilization was one minute.[22] And the group 3 was provided conventional treatment protocols that include stabilization exercises, stretching excercises and posture training.[23] However, this baseline treatment was provided to other two groups, as well.

Table 1: *Baseline demographic and clinical characteristics.*

	Group 1 (n=25)	Group 2 (n=25)	Group 3 (n=25)
Age (years)	26.08 (5.477)	27.12 (5.540)	27.96 (4.1880)
Gender			
Male	13 (52%)	15 (60%)	13 (52%)
Female	12 (48%)	10 (40%)	12 (48%)
Pain intensity before treatment (numeric pain rating scale)	7.04 (1.338)	7.52 (0.871)	7.16 (0.943)
Functional status of neck before treatment (neck disability index)	31.56 (5.561)	25.04 (7.086)	25.56 (5.478)

The data were entered and analyzed using SPSS version 21. The data were presented in the form of mean ±SD. Pre and post assessed parameters for pain intensity and functional status were compared by using paired sample t-test for intra group comparison and one way ANOVA was used for among group comparison. P-value ≤0.05 was taken as significant.

The study was proved from the ethical committee of the research institution with reference number. RCRS-RE-MS-OMPT/fall15/004.

Results and Discussion

The results showed that average age were 26±5.477 for SNAGs group, 27.17±5.54 for Maitland group and 27±4.188 for conservative group. In group 1, 52% male and 48% female, group 2, 60% male, 40% female and in group 3, 52% male and 48% female were included (Table 1).

The results showed pre-treatment pain intensity for group 1 was 7.04±1.338 that changed to 3.52±0.714 and for group 2 it was changed from 7.52±0.872 to 5.16±0.850 and 7.16±0.943 to 5.12±0.781 for group 3. NDI score for group 1, 2 and 3 were 31.56±5.560, 25.040±7.086 and 25.560±5.477 that were changed to 13.120±2.759, 16.360±2.899 and 12.600±2.020 respectively (Table 2).

The one way ANOVA test compared mean of three groups and p-value after treatment was p=0.000 and for functional status p=0.000.

Figure 1 and 2 showed the pain intensity and functional status of neck in line graphs.

The purpose of this study was to determine "comparative efficacy of manual therapy outcomes of SNAGs and Maitland manual therapy in non-specific neck pain on numeric pain rating scale and neck disability index". In a general notion results depicted that subjects in all three groups performed well. The pre and post values of the SNAGs group, the Maitland group and the conventional group were improved at all levels of assessment on both sides. According to this study, non-specific neck pain was more common in males (55%) than females (45%). The patients included in the study belong to age group of 20-39 years.

The baseline pain intensity mean±SD was 7.04±1.338 for group 1, 7.52±0.871 for group 2 and 7.16±0.943 for group 3 that were changed to 3.52±0.714, 5.16±0.850 and 5.12±0.781 after four week treatment, respectively. The difference among pain intensity showed more improvement in group 1 received SNAGs (3.52) than group 2 received Maitland mobilization (2.36) and group 3 received conventional treatment (2.04).

Table 2: *Summary result for each study group.*

	Group 1 (n=25)		Group 2 (n=25)		Group 3 (n=25)	
	Baseline mean(SD)	After 4 weeks mean(SD)	Baseline mean(SD)	After 4 weeks mean(SD)	Baseline mean(SD)	After 4 weeks mean(SD)
Pain Intensity (NPRS)	7.04±1.338	3.52±0.714	7.52±0.871	5.16±0.850	7.16±0.943	5.12±0.781
Functional status of neck (NDI)	31.56±5.561	13.12±2.759	25.04±7.086	16.36±2.800	25.56±5.478	12.60±2.020

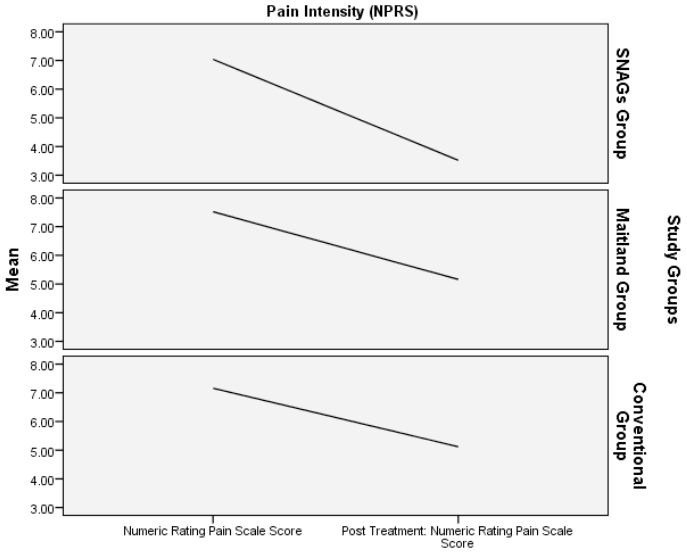

Figure 1: *Pain intensity (NPRS).*

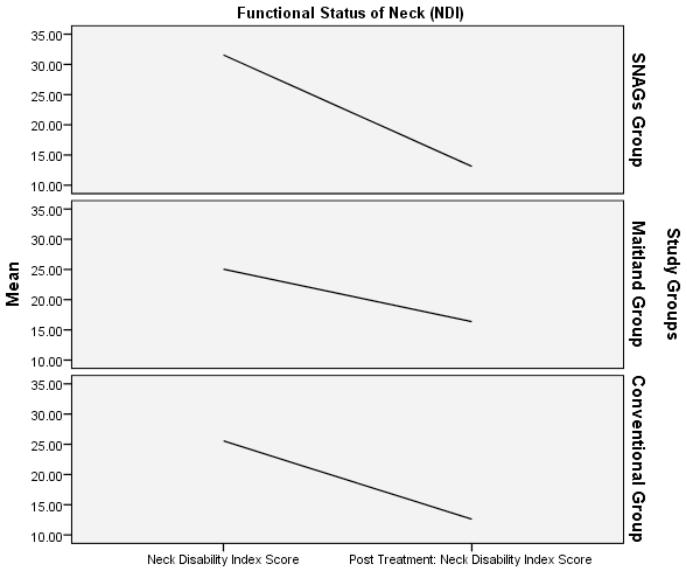

Figure 2: *Functional status of neck (NDI).*

The change in pain intensity was significant for group 1 but not for group 2 and 3. The past study depicted decrease in pain intensity of neck with mean difference 3.58 for Maitland mobilization group, 3.2 for Mulligan mobilization group and 3.50 for conservative group after three weeks treatment.[21]

The NDI score (mean±SD) was 31.56±5.561 for group 1, 25.04±7.086 for group 2 and 25.56±5.478 for group 3 that were changed to 13.12±2.759, 16.36±2.800 and 12.60±2.020 following four week treatment individually. The distinction among NDI score indicated more change in group 3 got conventional treatment (12.96) than group 1 (18.44) and group 2 (8.68). The improvement in functional status of neck was noteworthy for group 3 then for group 2 and group 1, respectively. The previous study delineated decline in NDI score with mean distinction 6.6 for Maitland mobilization group, 5.7 for Mulligan mobilization group and 4.9 for conservative group following three weeks treatment.[21]

Maitland and control technique has got space in modern literature as an effective maneuver but its comparative effectiveness is still under study and controversial. This technique carries advantages of being simple, more focused and carrying fewer side effects in terms of undue. Also that it is comprehensive in application and associated more with targeted improvement in terms of range and length of muscles. One study stated the efficacy of Mulligan NAGs in neck pain. The results demonstrated that NAGs are effective mobilization techniques for reduction of pain and improvement of cervical rangeof motion for neck pain patients.[23]

Rajesh Gautam et al. conducted study to compare Maitland and Mulligan mobilization techniques for neck pain and ROM. It found that Mulligan mobilization was more effective than Maitland in improving neck pain, functional status of neck and ROM.[25]

However, no one treatment is perfect to decrease pain and improve functional status of neck. But combination of manual therapy and conventional treatment options yield outstanding outcomes. Future research on large number of patients and long follow up is required to generalize the results of this study.

Conclusion

The SNAGs mobilization is more effective in the management of non-specific neck pain and conventional treatment improved functional status of neck than Maitland mobilization.

Author's Contribution

Fahad Tanveer: Conceived and designed the research
Adnan Afzal: Reviewed the manuscript
Muhammad Adeel: Statistical analysis and edited the manuscript.
Sana Shahid: Data collection
Maham Masood: Wrote the manuscript

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