

Original Article

COMPARISON OF MAITLAND AND MULLIGAN MOBILIZATION IN IMPROVING NECK PAIN, ROM AND DISABILITY

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ABSTRACT

Neck pain is a common problem with point prevalence of 13 % (Bovim G et al 1994)¹. Two-third of the population having neck pain at some point in their lives (Binder AL 2007)². Neck pain is increasing in both intensity, frequency and severity of episodes as people are increasingly sedentary. Different types of mobilization are employed to treat neck pain, but limited studies are done to compare their effectiveness of two different mobilization techniques in treatment of neck pain. Total of 30 subjects were taken and divided randomly into three groups: Group A, group B, group C (each group with 10 subjects). Group A was under conventional therapy. Group B under Maitland mobilization techniques and group C under Mulligan mobilization technique. Treatment was given 4 times a week for total of 30 days. Pain, disability and ROM were assessed by numerical pain radiating scale, NDI and universal goniometer. Assessment was done at 0, 15th and 30th day of treatment. Anova and Paired t-test were used. Statistical significance was set at 5% level. This study showed that mulligan mobilization is more effective in improving pain, ROM and disability. Although both experimental groups showed decrease in pain, disability and improved ROM but Mulligan mobilization was found to be more effective in improving pain, ROM and disability.

KEYWORDS: Maitland mobilization, Mulligan mobilization, Neck pain, Range of motion, Disability, NDI (neck disability index)

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INTRODUCTION

The neck pain is a public health problem and a common source of disability in the general population (Pierre et al 2003)³. Neck Pain is a common problem with point prevalence of 13% (Bovim G, 1994)⁴ and life time prevalence of 50 % (Hultz L, 1954)⁵. Neck pain is a common problem in our society and, at any given time, affects about 10% of the general population (Donald R. Gore 1998)⁶. Estimates of the prevalence of chronic neck pain vary. In a Swedish population (Guez et al, 2002)⁷ 18.5% of females and 13.2% of males had neck pain for longer than 6 months; however, when continuous chronicity was rated, these figures

were reduced to 10% and 7%, respectively. A Finnish study (Makela et al, 1991)⁸ reported chronic neck pain in 13.5% of females and 9.5% of males.

The best and most widely accepted method of classification for pain is diagnostic triage, where patients are categorized as falling into one of three groups (Waddell G, 1998)⁹: serious spinal pathology; neurological involvement; and non-specific pain.

Each year, 27% to 48% of workers suffer NSNP (Peter Rothfels et al 2010)¹⁰. Non specific neck pain usually resolves within days or week, but can reoccur or become chronic. The systemic

review found evidence that in patients with chronic pain treated in secondary care or an occupational setting, 20%-78% of patients remained symptomatic, irrespective of therapy given (Borghouts et al, 1998)¹¹.

Maitland's techniques involve the application of passive and accessory oscillatory movements to spinal and vertebral joints to treat pain and stiffness. Grade I is a small amplitude movement performed below the range of resistance and is suitable for treating highly irritable conditions. Use of Grade I enable the slack in collagen to be taken up when connective tissue is not under load and can relieve pain by working on neural structures (Threlkeld 1992)¹². A Grade II mobilization is wider in amplitude but still below resistance. Use of Grade I and II are appropriate when palpation elicits pain before restriction of movement. Grade III and IV are used when resistance to movement is encountered before pain. A Grade III is a large amplitude movement performed within resistance and generally used to improve range of motion. Grade IV is a small amplitude movement performed within resistance used for chronic aches of low irritability. Grade V is a high velocity thrust used in manipulation. Maitland also prescribes stretching techniques to deal with muscle spasm (Maitland, 2002, 1998)^{13 14}.

When the patient is capable of 60% of normal range of movement unencumbered by pain then physiological mobilizations should be employed in pursuing the eventual establishment of normal range of movement (Maitland 1998)¹⁴.

Maitland argues that the comparable pain response "is nearly always found with the unphysiological movement rather than the physiological movement". Conversely, Mulligan applies movement in sympathy with physiological movement. Mulligan's principle techniques are NAGS, SNAGS and MWMs (Mulligan 1993)¹⁵. NAGS are natural apophyseal accessory glides applied to the cervical spine with the patient passive. SNAGS are sustained natural apophyseal accessory glides whereby the patient attempts to actively move a painful or stiff joint through its range of motion whilst the therapist overlays an accessory glide parallel with the treatment plane. MWMs are mobilizations with movement and are applied

to the peripheral joints.

The underlying principle to MWMs is derived from Kaltenborn (Exelby 1995)¹⁶ who argued that joint surfaces are not fully congruent, physiological movements are a combination of rotation and glide, and glide is essential to pain free movement.

An agitated central nervous system may cause soft tissue pain even after the tissues have recovered from strain. Mechanoreceptors over react to sudden stretching of connective tissue in an acute injury and continue to fire for longer than the protective mechanism warrants. The alterations in muscle tone then misalign the joint that, in turn, transmits proprioceptive stimuli to the already excited central nervous system thereby perpetuating its own malfunction. Manual therapy may re-establish a normal lower level of proprioceptive stimulation or 'mobilisation induced analgesia' (Zusman 1985)¹⁷

The objectives of the study:

- To find out the effectiveness of Maitland mobilization in improving neck pain.ROM and disability.
- To find out effectiveness of mulligan mobilization in improving neck pain, ROM and disability
- To compare the effectiveness of two different techniques of mobilization in improving pain, ROM and disability

METHOD

Study design: Experimental controlled design. Study setting: Patient were included in this preliminary, randomized, multicentered trial after obtaining their informed consent Population and sampling: 30 subjects with mechanical non specific neck pain of either sex in age group of 20-45 years were selected and were divided into three groups.

Criteria for sample selection

Inclusion criteria

- Age group between 20-45 years.
- Patient with primary complaint of non specific neck pain.
- Pain of sufficient intensity (greater than 2 out of 10 on numerical pain scale) to permit clinically worthwhile effect to be demonstrated.
- Pain and stiffness for at least 2 weeks

- Pain aggravated by movement
- Willingness to adhere to treatment and measurement regimes.

Exclusion criteria

- Osteoporosis.
- Weight loss, fever, history of malignancy.
- Inflammatory arthritis (AS).
- Structural abnormality effecting neck.
- Patient taking anticoagulants.
- Neck pain due to trauma
- Previous fracture

Independent Variables:

1. Maitland mobilization
2. mulligan mobilization
3. moist heat packs
4. active exercises
5. Isometric exercises.

Dependent Variables:

1. Pain.
2. Range of motion.
3. Disability.

Instruments and tools-Universal Goniometer, Towels, Pillows, Cervical moist hot packs, Neck disability index, Numerical pain rating scale

Technique of data collection

During the initial session, a history, subjective and objective examination and thorough orthopedic examination were performed. On 0th day cervical range of motion was measured using universal goniometer. Disability was assessed by using Neck disability index and pain on numerical pain rating scale.

PROCEDURE

All the eligible subjects were divided into three groups.

Group A was the control group and received conventional physiotherapy which includes

- 1 Active exercises-10 repetitions in all direction in pain free range
- 2 Isometrics-5-10 seconds brief but maximum contraction each held for 5-16 seconds for flexors, extensors, side flexors and rotators.
- 3 Moist hot packs sitting position for 15 minutes on cervical region in with head resting on table

with a pillow.

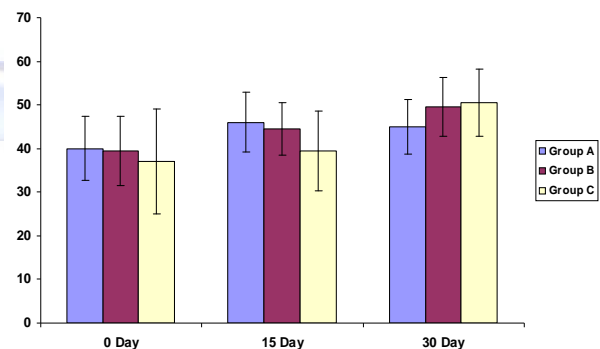
Group B received conventional therapy plus Maitland grade 2 oscillatory movements for 60 seconds with 2-3 hertz. Starting with grade 2, repetitions were subsequently increased in progressive

Group C received conventional therapy plus mulligan mobilization (NAGS, SNAGS) NAGS were given with 2-3 hertz (for less than 6 repetition) and SNAGS for 6 repetition in 3 sets. The mobilization was repeated for less than 6 times and then movement was reassessed. Treatment was given 4 times a week for total of 30 days. Pain, Range of motion and disability were assessed by Numerical pain rating scale, Universal goniometer and Neck disability index on 15th and 30th day of treatment

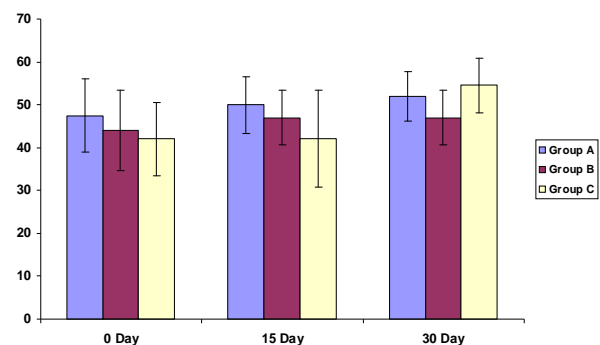
Statistics were performed by using SPSS 11. Results were calculated by using a 0.05 level of significance. Using statistical formula for the mean and standard deviation for a given number of subjects, mean of different variables was calculated. ANOVA and paired t test were used.

Data analysis and interpretation

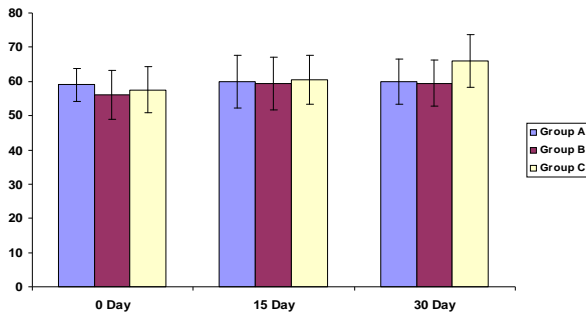
Comparison of mean values of Flexion at 0, 15 and 30 days between Group A, Group B and Group C



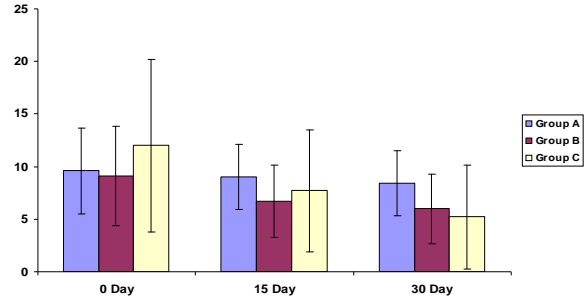
Comparison of mean values of Extension at 0, 15 and 30 days between Group A, Group B and Group C



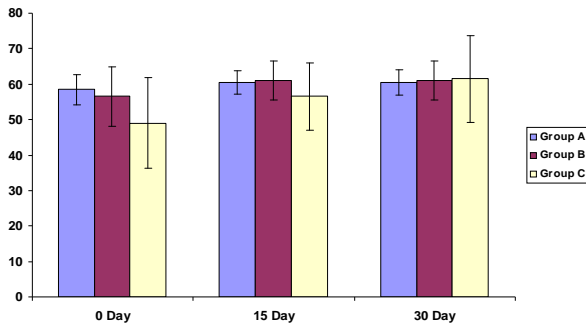
Comparison of mean values of R. Rotation at 0, 15 and 30 days between Group A, Group B and Group C



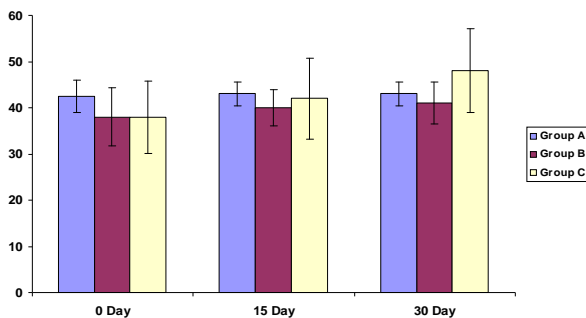
Comparison of mean values of NDI at 0, 15 and 30 days between Group A, Group B and Group C



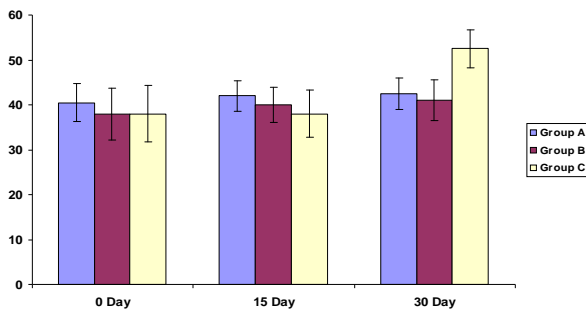
Comparison of mean values of L. Rotation at 0, 15 and 30 days between Group A, Group B and Group C



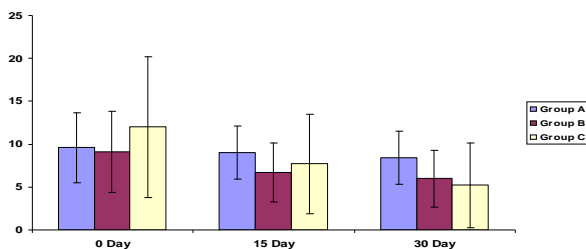
Comparison of mean values of R. Side Flexion at 0, 15 and 30 days between Group A, Group B and Group C



Comparison of mean values of L. Side Flexion at 0, 15 and 30 days between Group A, Group B and Group C



Comparison of mean values of NDI at 0, 15 and 30 days between Group A, Group B and Group C



RESULTS AND DISCUSSION

Variables within group A which show significant improvement (**p<.05 is significant**)

Flexion between 0 to 15 day (p=.03) Extension between 0 to 30 day (p=.019), Extension between 15 to 30(p=.037), left rotation between 0 to15 (p=.037), NPRS between 0 to 30(p=.013).

Variables within group B which show significant improvement:

Flexion between 0 to 30 day(p=.000),flexion between 15 to 30 day(p=.008), rt. rotation between 0 to 30 day(p=.010), rt. rotation between 15 to 30 day(p=.010), lt. rotation between 0 to 30 day(p=.024), lt. side flexion between 0 to 15(p=.024), lt. side flexion between 15 to 30(p=.003), NDI between 0 to 15(p=.003), NDI between 15 to 30(p=.007), NPRS between 0 to 15(p=.001).Variables within group C which show significant results:

Flexion between 0 to 30(p=.000), flexion between 15 to 30(p=.000),extension between 0 to 30(p=.000),extension between 15 to 30(p=.002), rt. Rotation between 15 to 30(p=.003),rt. Rotation between 0 to 30(p=.000),lt. Rotation between 0 to 30(p=.001), rt side flexion between 0 to 15(p=.008),rt. Side flexion between 0 to 30(p=.003),lt. Side flexion between 0 to 15(p=.000),lt. Side flexion between 0 to 30(p=.003),NDI between 0 to 15(p=.000),NDI between 0 to 30(p=.000),NDI between 15 to 30(p=.012),NPRS between 0 to 15(p=.004),NPRS between 0 to 30(p=.013),NPRS between 15 to 30 day(p=.011)

This study showed that mulligan mobilization is more effective in improving Pain, ROM and Disability although both experimental groups (group B and C) showed decrease in pain and disability but group C showed significant decrease in pain and disability and improves

ROM.

Similar study was done by Varsha et al (2007)¹⁸ in which they compared Maitland and mulligan mobilization in patients with colle's fracture, conclude that mulligan mobilization could be used effectively when pain predominates while Maitland mobilization could be effectively used to restore mobility when pain is not the major concern.

Edmonston and Singer (1997)¹⁹ stated "The SNAG's technique described by Mulligan is of particular importance in the context of painful movement dysfunction associated with degenerative changes. These techniques facilitate pain free movement throughout the available range and since movement is under control of patient, reduce the potential problems associated with end range passive movements in degenerative motion segments.

Exelby (1995)²⁰ argues that the zygoapophyseal joints guide the spine and so improving their glide by applying NAGs and SNAGs will improve the range of spinal movement.

A Randomized controlled trial conducted by Paungmali(2003)²¹ examining mulligan movement with mobilization for lateral epicondylagia reported significant improvement in pain free grip force as well as thermal pain and pressure pain threshold ,when compared to pre treatment baseline scores.

Further to support the effect of mulligan mobilization research by Paungmali(2004)²² demonstrate additional evidence of mulligan's movement with mobilization technique to produce centrally mediated hypoalgesia by failure of intravenous injection of Naloxone, a recognized opium inhibitor, to inhibit the effect of technique .The failure of technique to demonstrate tolerance to repeated application yet again points to non-mechanical, non-opioid mechanism of hypoalgesia.

CONCLUSION

Thirty patients of both sexes with mechanical non specific neck pain in age group of 20-45 were investigated to find out the comparison of maitland and mulligan mobilization in improving Pain,ROM and disability over a period of 30 days. The results showed significant improvement in patients treated with mulligan mobilization as

compared to maitland treated group..

Therefore from the literature available and the statistical analysis of data obtained following the treatment concludes that, "**Mulligan mobilization is better than maitland mobilization in improving Pain,ROM and disability**"

Conflicts of interest: None

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