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EFFECT OF SNAGS ON MECHANICAL NECK PAIN

Abstract :
Background : Neck pain is a rampant problem which is definitely on the increase especially during the pandemic. This pandemic has resulted in many professionals using the computers/laptops. One of the reasons of neck pain has been postural malalignment. Traditionally, there have been methods to treat the pain. There have been studies with traditional physical therapy agents.
Aim: This study is to understand the effect of SNAGS in people working from home and having neck pain.
Methods : a comparative study was done using Mulligan SNAGS versus traditional methods on 30 subjects. 15 were put into each group. Outcome measures used were VAS, Neck disability index and range of motion.
Results : SNAGS and postural advice showed better improvement than only the postural advice.
Conclusion : statistical analysis showed that SNAGS and postural advice (group B) showed better improvement in terms of reduction of pain and NDI scores and improvement in ROM as compared to postural advice group.
Keywords: Mulligan Self Mobilization, Mulligan SNAG, Joint Reposition Error, Neck Disability Index, Visual Analogue Scale

INTRODUCTION

The use of the computer is improving the quality of health care systems as well as the efficiency of the workers on one hand but on the other hand, as one uses computers for many hours continuously, he or she may notice increasing aches and pains in some parts of the body, usually, musculoskeletal in nature. COVID-19 pandemic has definitely brought the workforce home. The ergonomics used at home are mostly not in the correct alignment.

Pain in the neck has become one of the leading problems nowadays. Neck flexion, forward head posture, scapular retraction, forward stoop posture are some of the faulty postural alignment, resulting in neck pain due

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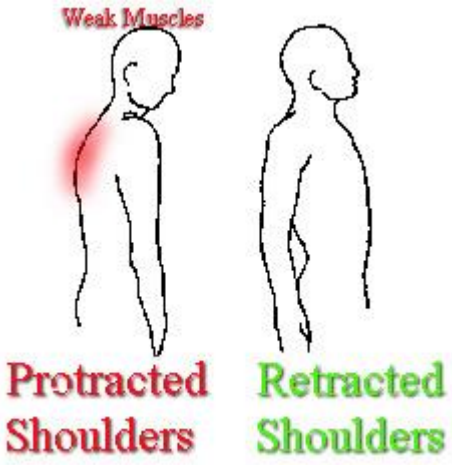
to increased cervical muscle activity to support head in forward position and results in increase in fatigue. Neck pain leads to not only reduction in their working ability but also hampers other recreational activity. The posture they assume may be related to working at an incorrect height or in poor lighting. The other reason could be people with chronic pain compensate by thrusting their head forward to move away from the pain.[1]



This postural deviation puts abnormal stress on soft tissues and changes the weight bearing surfaces of the vertebrae. Forward head posture causes muscle length adaptation, which results in altered biomechanics such that normal motions produce abnormal strain. The muscles commonly affected are levator scapulae, upper trapezius, sternocleidomastoid, scalene and sub occipital muscles.

Over the months, the assumed posture becomes comfortable and accepted as normal[3]. The proprioceptive stimuli of this assumed posture have no impact upon the cortical interpretation. Thus, the forward head posture is accepted, and the muscular tone needed to support this posture is also accepted. The person perceives no need to correct the assumed posture because there is no discomfort or fatigue initially. The fact is that the posture holding the head forward of the center of gravity is ignored, although it demands excessive muscle action.

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Sustained muscle tension of the neck accumulates excessive muscular metabolites which become irritants and cause resultant muscular contraction. The contracted muscle literally constricts the intrinsic blood vessels so that while there is excessive muscular contraction requiring blood supply, there is diminished blood flow. Ischemia results and there is venous lymphatic compression, which prevents washing out of the accumulated metabolites. Thus, causing neck pain.[3]

Neck pain may originate from various tissues in cervical spine. Pain may be produced by numerous mechanisms through various pathways. The tissue reaction causing the production of nociceptive agents that affect the end organs of sensory nerves with resultant pain is becoming more evident. These nociceptive agents are anterior longitudinal ligament, outer annulus, dura, posterior longitudinal ligament, facet capsule, muscles and ligaments.[3]

Therapeutically electrophysiological agents have traditionally been the treatment of choice. One such modality would be applications of cold using ice packs or a cryo-stimulation device. Heat can be applied using short wave diathermy (for dry heat), hydro collator packs (for moist heat) or a heating pad. Ultrasound uses sound waves to create a deep heating effect. Electrical muscle stimulation (EMS) is used to exercise and strengthen specific muscle groups, while TENS (transcutaneous electrical nerve stimulation) units provide therapeutic nerve stimulation to reduce neck pain.

Along with the modalities that reduce the neck pain, postural correction has remained a mainstay in the treatment of neck pain. An emphasis on patient responsibility with monitoring postures and habits recruits the patients as an active participant in their treatment. Modern manual therapy includes Maitland, Mulligan and Mc Kenzie concepts of mobilizations. Mulligan further has its techniques on peripheral joints and on spine. Passive oscillatory mobilizations called 'NAGs' (natural apophyseal glides) and sustained mobilizations with active movement.
'SNAGS' (sustained natural apophyseal glides) are the mainstay of this concept's spinal treatment.

SNAGS are sustained natural apophyseal accessory glides whereby the patient attempts to actively move a painful or stiff joint through its range

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of motion whilst the therapist overlays an accessory glide parallel with the treatment plane. The facilitatory glide must result in full range pain free movement. Sustained end range holds or overpressure can be applied to the physiological movement. SNAGS are most successful when symptoms are provoked by a movement. They are not the treatment of choice in conditions that are highly irritable.[2]

The response of the patient to treatment must be continually monitored. Once correct pain free gliding has been established it must be maintained in functional activity.

Through this study we would like to study the additional effect of SNAGS and postural advice on neck pain.

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To study the effect of snags and postural advice and only postural advice on neck pain in people using computers.

OBJECTIVES

To study the effect of

1) SNAGS and postural advice on neck pain.
2) SNAGS and postural advice on neck ROM.
3) SNAGS and postural advice on neck disability index.

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LITERATURE REVIEW

- TITLE: The effectiveness of self snags over conventional physiotherapy management in chronic neck pain among computer professionals Vol 2, No. 3 (2008-07 - 2008-09**)**
- AUTHOR: Shilpi Chhabra, Deepti Chhabra, Jatinder Sachdeva, Amit Chaudhary
- CONCLUSION: This study depicted that group receiving self SNAGS showed better carry over effect during treatment phase and more during follow up phase as compared to group receiving conventional physiotherapy alone.

- TITLE: The efficacy of physiotherapy: A literature review with reference to the Maitland and Mulligan paradigms in the mobilization of a joint.
- AUTHOR: David Tierney
- CONCLUSION: Both Maitland and Mulligan provide apparently effective mobilization techniques but the literature is uncertain about why they work. The techniques are complementary and may be used in conjunction with one another or separately.

- TITLE: The Mulligan concept: Its application in the management of spinal conditions
- AUTHOR: L. Exelby
- CONCLUSION: The strength and enduring capabilities of this concept lie in the founder's philosophy of encouraging integration of mulligan techniques into the individual therapist's clinical practice.

  Manual Therapy (2002) 7(2), 64–70

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- TITLE: The Cultural Adaptation, Reliability and Validity of Neck Disability Index in Patients With Neck Pain
- AUTHOR: Aslan, Emine PT, PhD; Karaduman, Ayse PT
- CONCLUSION: NDI in the Turkish format was realized to be a valid and reliable method for measuring and evaluating disability of the neck. It is easier to understand and doesn't take long to be applied.

- Title: **Neck Disability Index:** A study of reliability and validity.

- Author : Vernon, H., & Mior, S.
- Conclusion: this study demonstrated that the NDI achieved a high degree of reliability and internal consistency.

- TITLE: Active Neck Motion Measurements with a Tape Measure
- AUTHOR : CHANG YU HSIEH
- CONCLUSION : The intratester reliability coefficients, determined by correlation analysis, ranged from 0.80 to 0.95 for the experienced tester and 0.78 to 0.91 for the inexperienced tester.

HYPOTHESIS

Alternate hypothesis:

There will be a difference in VAS, ROM and Neck disability index after SNAGS mobilization and postural advice.

Null hypothesis

There will be no difference in VAS, ROM and Neck disability index after SNAGS mobilization and postural advice.

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METHODOLOGY AND STUDY DESIGN

Study design:

Type of study: Interventional
Sample size: 30

Inclusion criteria:

- male or female population
- 25 – 35 years of age
- Working on computers for at least 7-8hours
- Not on any kind of medications

Exclusion criteria:

- persons with rheumatoid arthritis, ankylosing spondylitis, tumors, vertebro basilar insufficiency symptoms
- cervical vertebral fracture
- Cervical headache

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Materials required:

- Visual analogue scale
- Measuring tape

Outcome measures:

Pain- on visual analogue scale
ROM- tape method
Functional outcome- neck disability index

Procedure:

Thirty subjects with neck pain for more than a month were recruited in the study after taking their informed verbal consent. They were evaluated with the following outcome measures prior to the intervention.

VISUAL ANALOGUE SCALE

Pain was measured on VAS pre and post treatment immediately. A scale of 0 to 10 was given. The subjects had to circle the pain score on the scale. It was taken daily for 6 days. A follow up was done after 2 weeks.

RANGE OF MOTION

The range was measured with a tape. The flexion, extension, lateral flexion and rotation ranges were measured pre treatment and daily for 6 days. A follow up was done after 2 weeks.
Flexion: from the tip of the chin to the sternal notch at the end of flexion.
Extension: from the tip of the chin to the sternal notch at the end of extension range.
Lateral flexion: between the mastoid process and the lateral tip of acromial process at the end of lateral flexion.
Rotation: from the tip of chin to the acromial process.

NECK DISABILITY INDEX

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For the cervical spine, assessment tool called the Neck Disability Index that is the most frequently used functional outcome tool for cervical related disabilities. This outcome assessment tool was created by modifying the Oswestry Disability Index and is extremely reliable.

The score was taken pre treatment on first day and post treatment on 6th day. A follow up was done after 2 weeks.

The nature of the study was explained to all the subjects and the importance of measuring the neck disability score pre and post intervention was revealed.
Most of the subjects came under the mild disability group.

Raw Score	Level of Disability:
0-4	No Disability
5 – 14	Mild Disability
15 – 24	Moderate Disability
25 – 35	Severe Disability

The subjects were divided into two groups of 15 each. 15 subjects were given SNAGS with postural advice while the other 15 were given only postural advice.

Group A:

The 15 subjects were given postural advice only. This includes:

- Keeping the spine straight while sitting on chair during work hours by resting their backs.
- Keep shoulders straight and braced.
- Take frequent breaks between work hours.

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Group B:
Position of the subject: sitting (weight bearing)
Position of the therapist: standing behind the subject with the medial border of one thumb's distal phalanx placed on the tip of the spinous process. The other thumb reinforces it. The border of the thumb is used because the spinous processes are very small and the pulpy terminal pad would not be selective enough as it is too wide.
Flexion:

- The medial border of the thumb was placed on the spinous process hooking it. The other thumb reinforced it gently in the supero anterior direction at a 45 degree angle.
- While this glide is being maintained, the subject performed flexion with an overpressure over the head at the end range.
- The glide is sustained for several seconds at the end range before returning to the neutral position.
- 10 repetitions were done and the flexion range reassessed.

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Extension:

- The medial border of the thumb was placed on the spinous process hooking it. The other thumb reinforced it gently in the supero anterior direction at a 45 degree angle.
- While this glide is being maintained, the subject performed extension with an overpressure on the chin at the end range.
- The glide is sustained for several seconds at the end range before returning to the neutral position.
- 10 repetitions were done and the extension range was reassessed.

Lateral flexion:

- The medial border of the thumb was placed on the spinous process hooking it. The other thumb reinforced it gently in the supero anterior direction at a 45 degree angle.
- While this glide is being maintained, the subject performed lateral flexion with an overpressure on the head towards the side of movement at the end range.
- As the subject lateral flexes, the therapist's hands are tilted to ensure that the mobilization is taking place with the movement.
- The glide is sustained for several seconds at the end range before returning to the midline.
- 10 repetitions were done and the lateral flexion range was reassessed.

Rotation:

- The medial border of the thumb was placed on the spinous process hooking it. The other thumb reinforced it gently in the supero anterior direction at a 45 degree angle.
- While this glide is being maintained, the subject performed rotation with an overpressure on the chin towards the right or left.
- As the head is rotated, the therapist follows with hands to ensure that the mobilization is taking place with the movement.
- The glide is sustained for several seconds at the end range before returning to the midline.
- 10 repetitions were done and the rotation range was reassessed.

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- Along with the mobilization the subjects were given postural advice as well.
- A follow up was done after 2weeks.

RESULTS AND ANALYSIS

As the data was of parametric criteria, paired t test was done within the group.
To compare data between two groups, unpaired t test was done.
As Neck Disability Index is an ordinal scale, Wilcoxon test was done within group and Mann Whitney between the groups.
To compare the data over 2 weeks repeated measures ANOVA was done.

Paired t test:

di= post value - pre value
d'= average of individual differences = $\sum di/n$ n=30
Standard deviation (SD) = square root of $[\sum(d'-di)^2/(n-1)]$
Standard error=standard deviation\square root of n
t=d'/Standard error

$$s_{\bar{D}} = \sqrt{\frac{\Sigma D^2 - \frac{(\Sigma D)^2}{n}}{n(n-1)}}$$

Formula for the standard error of difference

$$t = \frac{\bar{D}}{\sqrt{\frac{\Sigma D^2 - \frac{(\Sigma D)^2}{n}}{n(n-1)}}}$$

Calculation formula for the dependent t test

P value < 0.05 was considered significant

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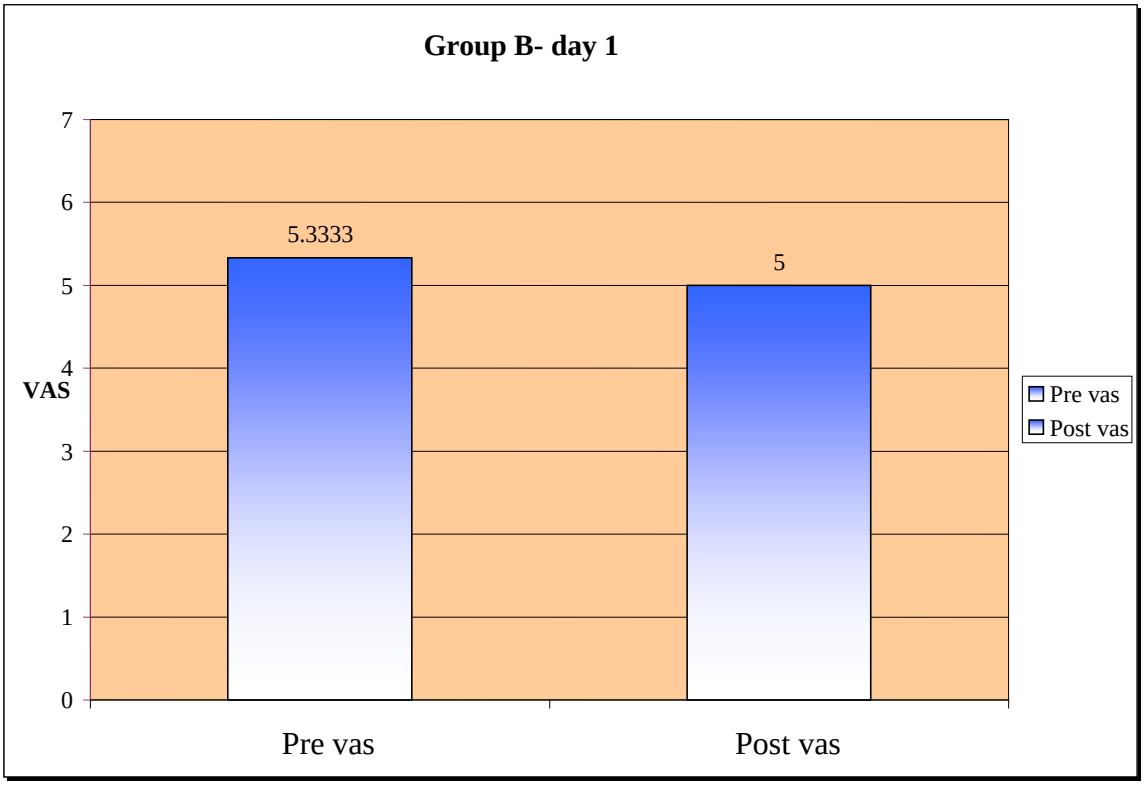
GRAPHS

GRAPH 1



	Mean	Standard Deviation	t Value	P value
Pre	5.533	1.060	3.228	0.0061
Post	5.000	1.069		

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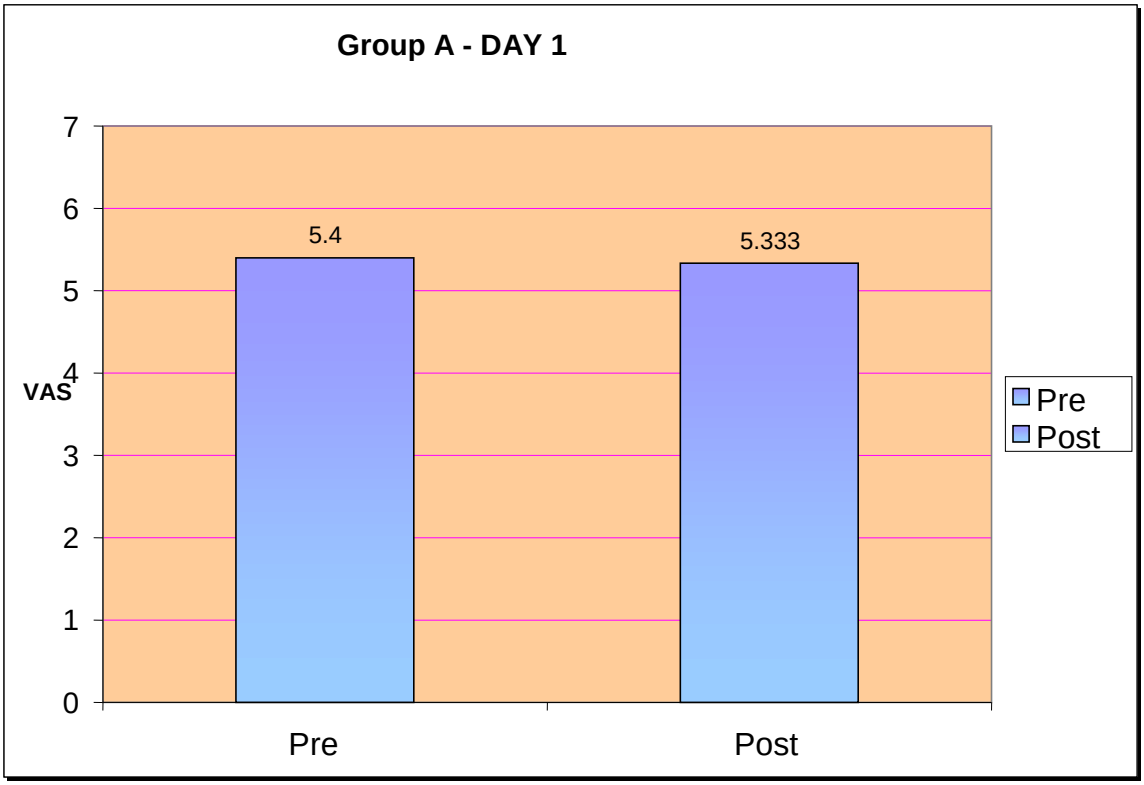
It is seen from the above graph that there is reduction in pain in group B (SNAGS and postural advice) on day 1 which is statistically significant when compared by paired t test.

GRAPH 2



	Mean	Standard Deviation	t Value	P value
Pre	5.400	0.9856		

Post	1.683	0.9759	1	0.3343

It is seen from the above graph that there is no significant difference in neck pain in group A (postural advice only) on day 1 when compared by paired t-test.

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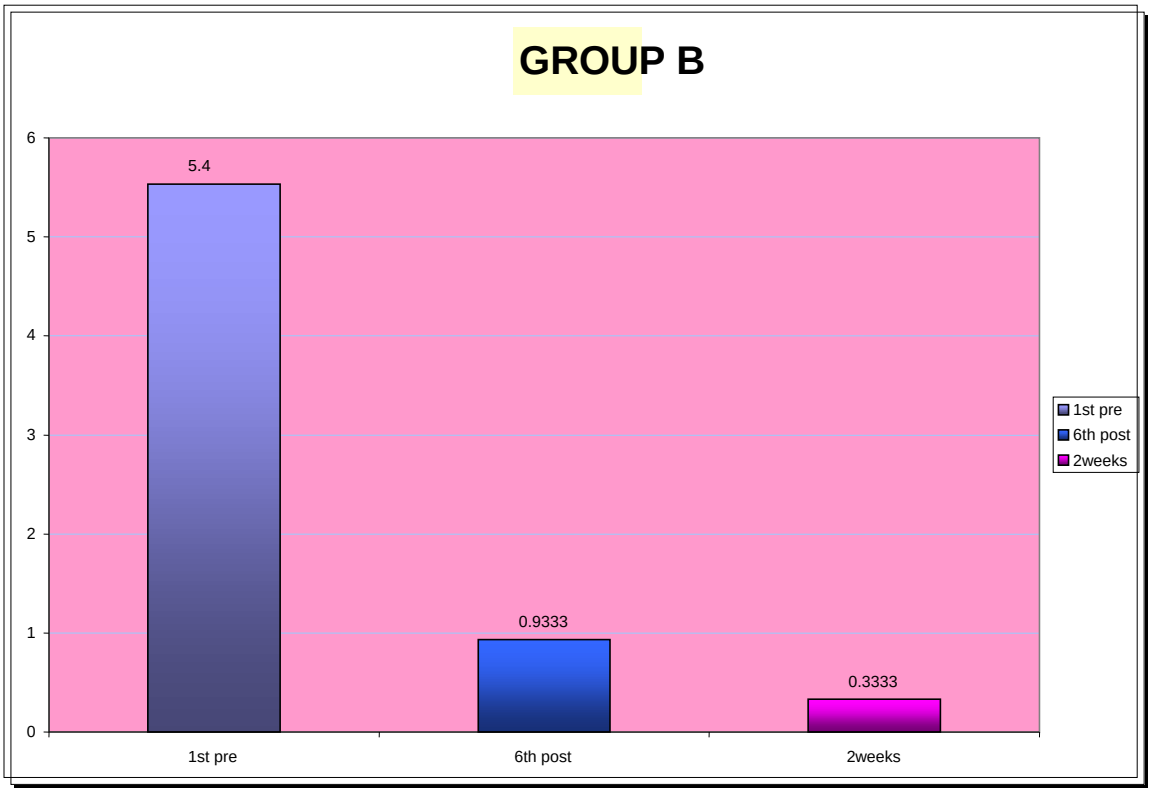
GRAPH 3
Repeated ANOVA measures



	Mean	Standard Deviation	Standard error of mean	median
Pre	5.4	1.060	0.2737	6.000
6th Post	0.9333	0.7988	0.2063	1.000
2 weeks	0.3333	0.4880	0.1260	0.000

It is seen from the above graph that there is reduction in pain in group B (SNAGS and postural advice) over 2 weeks which is statistically significant when compared by repeated measures ANOVA.

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GRAPH 4

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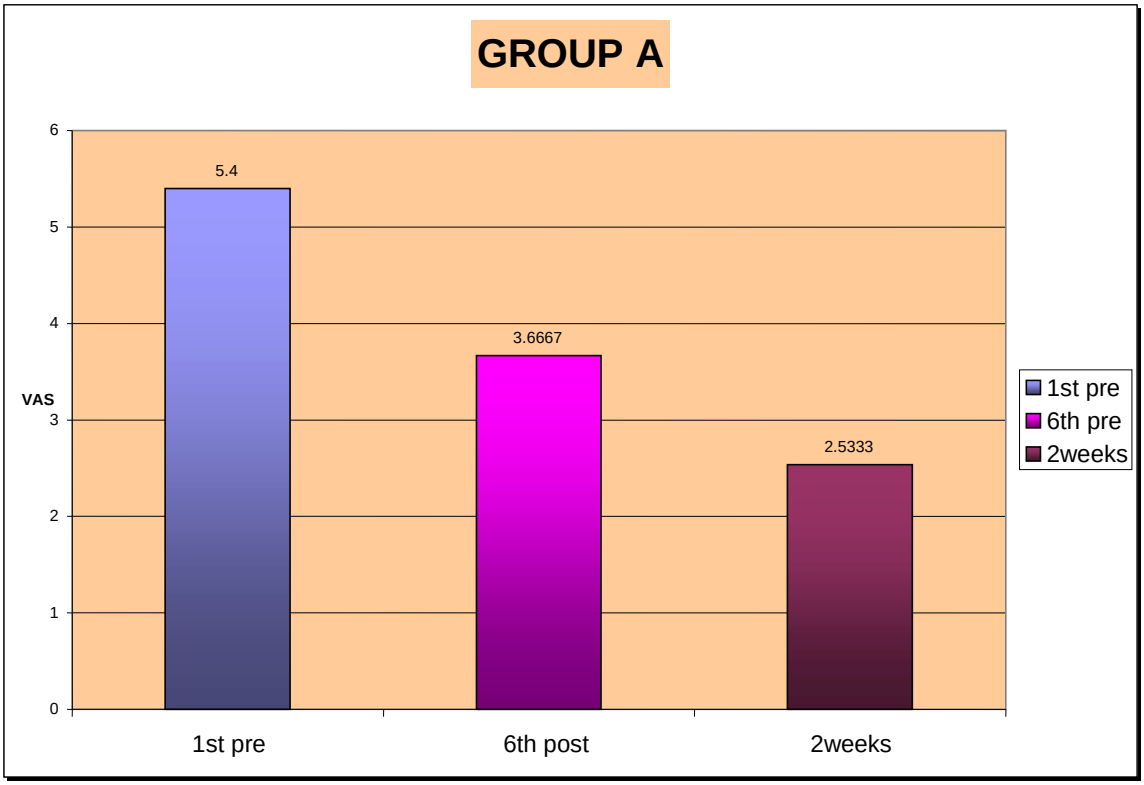

	Mean	Standard Deviation	Standard error of mean	median
Pre	5.4	0.9759	0.2520	5.000
6th Post	3.667	0.9759	0.2520	4.000
2 weeks	2.533	0.6399	0.1652	2.000

It is seen from the above graph that there is reduction in pain in group B (SNAGS and postural advice) over 2 weeks which is statistically significant when compared by repeated measures ANOVA.

GRAPH 5

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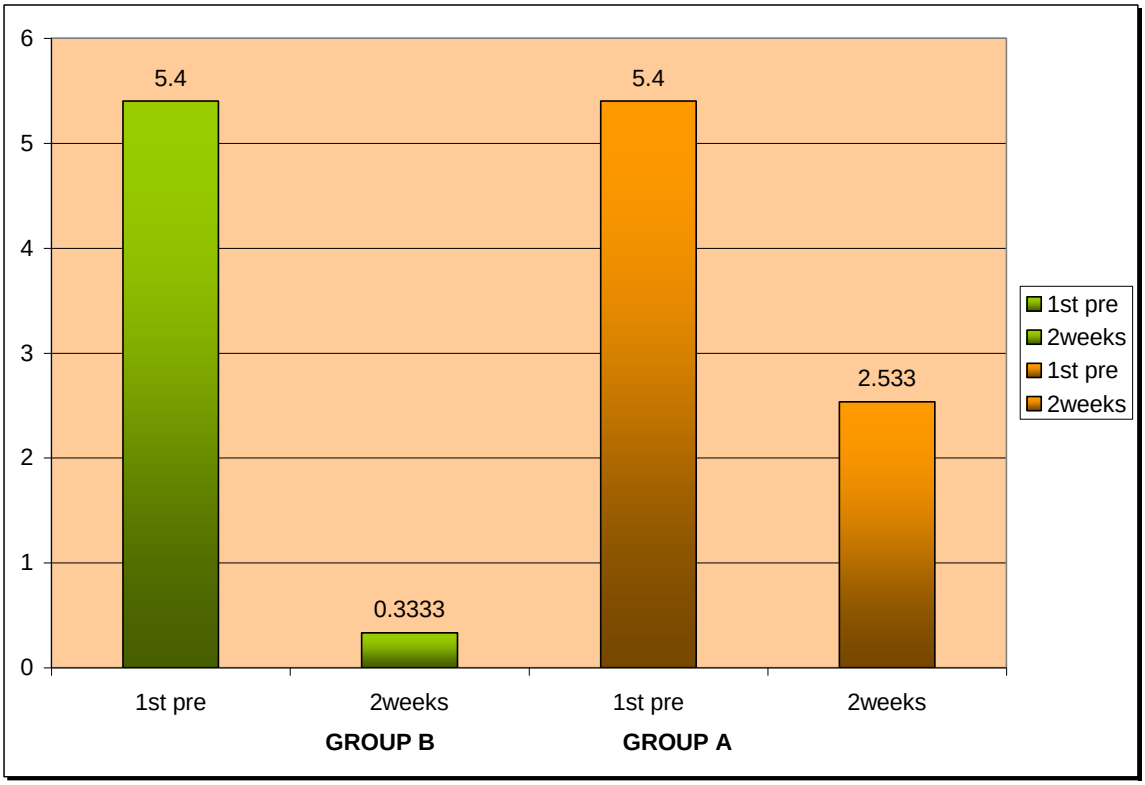

	Mean	Standard Deviation	T value	P value
Group B Pre	5.4	1.060	26.000	<0.0001
Group B 2 WEEKS	0.3333	0.4880	26.000	
Group A pre	5.4	0.9759	13.315	<0.0001
Group A 2 WEEKS	2.533	0.6399	13.315	<0.0001

When compared between the groups by unpaired t test, both showed significance, but group B (SNAGS and postural advice) showed better results than group A (Postural advice). 16

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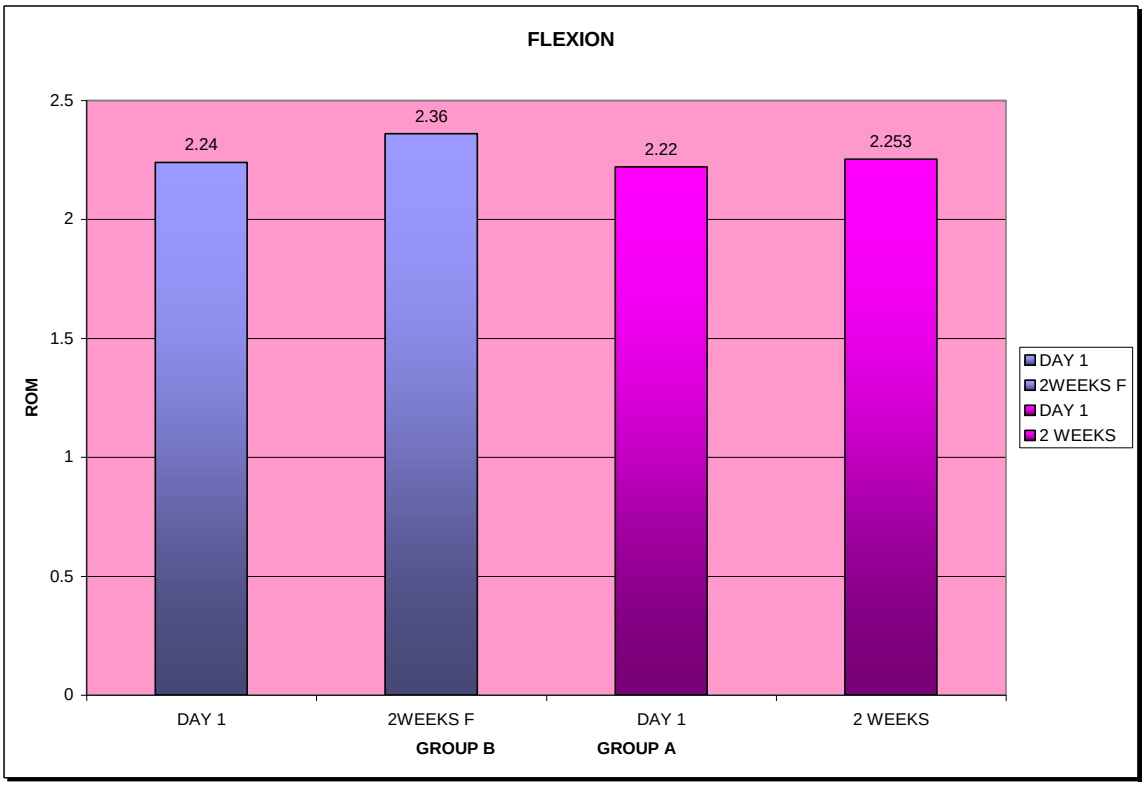
GRAPH 6



	Mean	Standard Deviation	t Value	P value
GROUP B Day 1 flexion	2.24	0.1724	5.392	<0.0001
GROUP B 2weeks	2.360	0.1121		
GROUP A Day1	2.22	0.1506	3.055	0.0086
GROUP A 2 weeks	2.253	0.1407	3.055	0.0086

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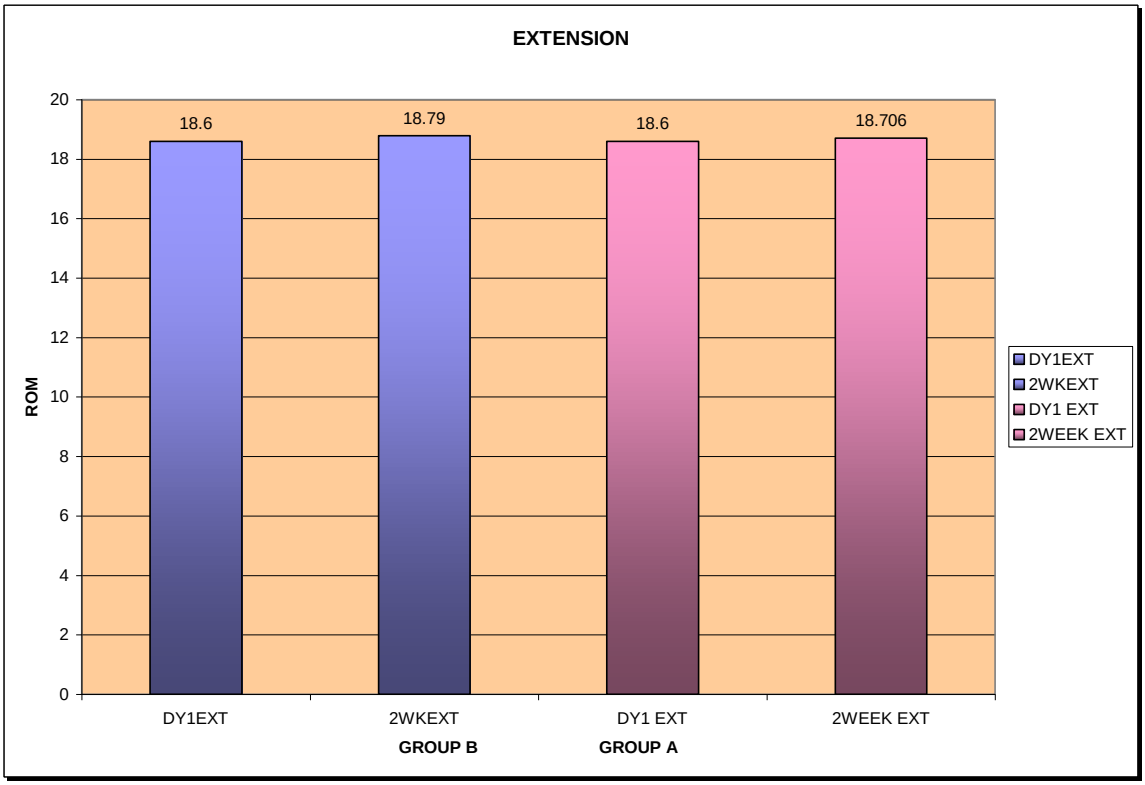
When compared between the groups by unpaired t test, both showed significance, but group B (SNAGS and postural advice) showed better flexion ROM results than group A (Postural advice).

GRAPH 7



	Mean	Standard Deviation	t Value	P value
GROUP B Day 1	18.6	0.5278	6.123	<0.0001
GROUP B 2 weeks	18.79	0.4935		
GROUP A day1	18.6	0.5866	3.761	0.0021
GROUP A 2 weeks	18.706	0.5788		

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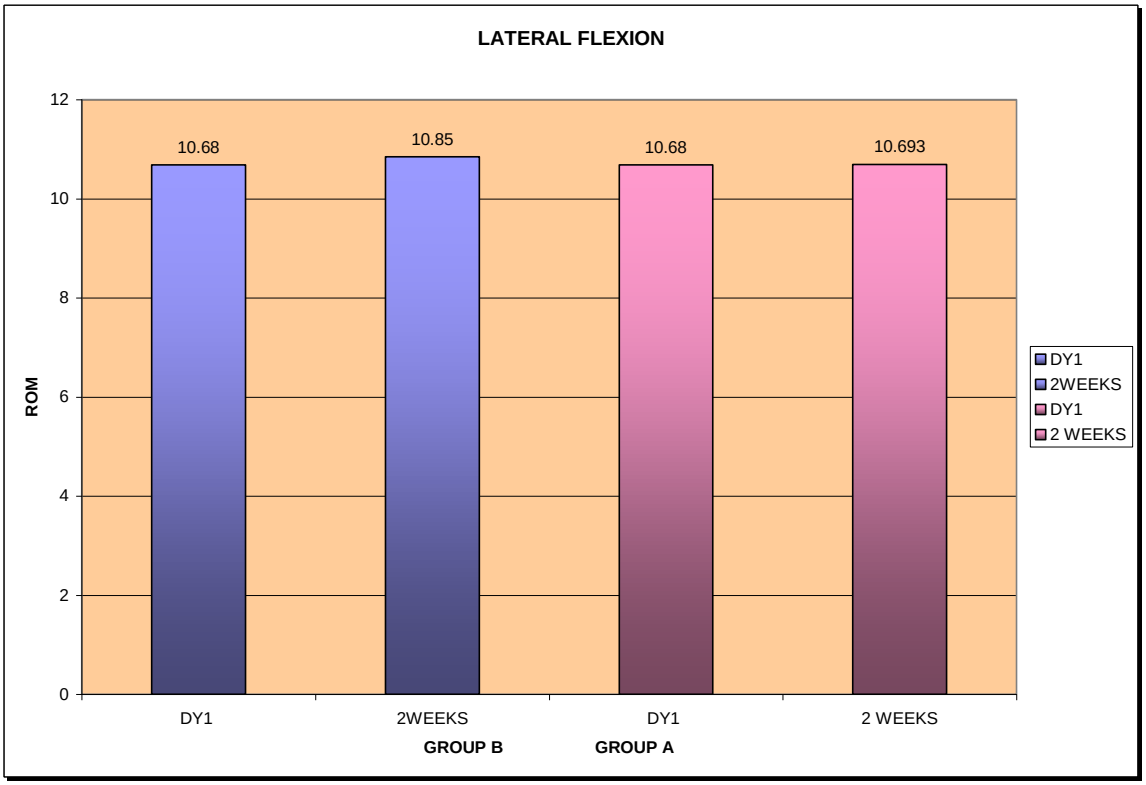
When compared between the groups by unpaired t test, both showed significance, but group B (SNAGS and postural advice) showed better extension ROM results than group A (Postural advice).

GRAPH 8



	Mean	Standard Deviation	t Value	P value
GROUP B Day 1	10.68	0.3314	5	0.0002
GROUP B 2 weeks	10.85	0.2669		
GROUP A day1	10.68	0.2875	3.595	0.0029
GROUP	10.693	0.2840		

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A 2 weeks				

When compared between the groups by unpaired t test, both showed significance, but group B (SNAGS and postural advice) showed better lateral flexion ROM results than group A (Postural advice).
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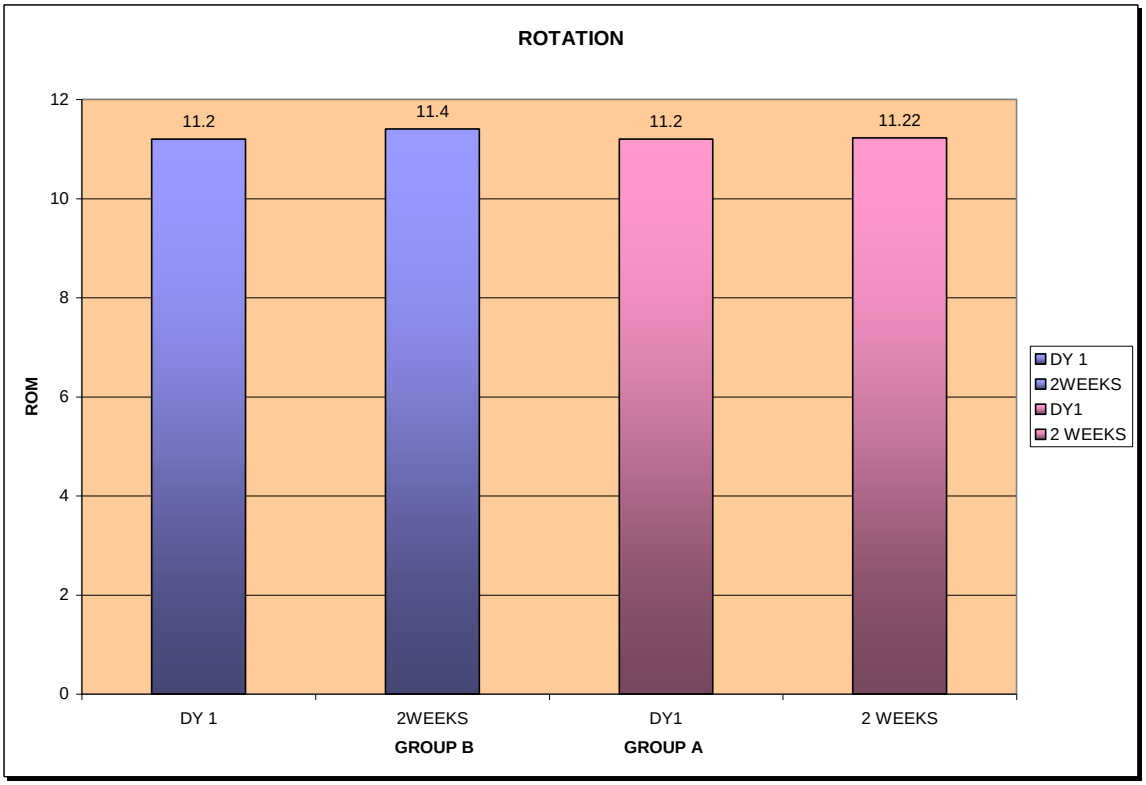
GRAPH 9



	Mean	Standard Deviation	t Value	P value
GROUP B Day 1	11.2	0.1426	6.481	<0.0001
GROUP B	11.4	0.1447		

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2 weeks				
GROUP A day1	11.2	0.1246	2.256	0.0406
GROUP A 2 weeks	11.22	0.1060		

When compared between the groups by unpaired t test, both showed significance, but group B (SNAGS and postural advice) showed better rotation ROM results than group A (Postural advice).

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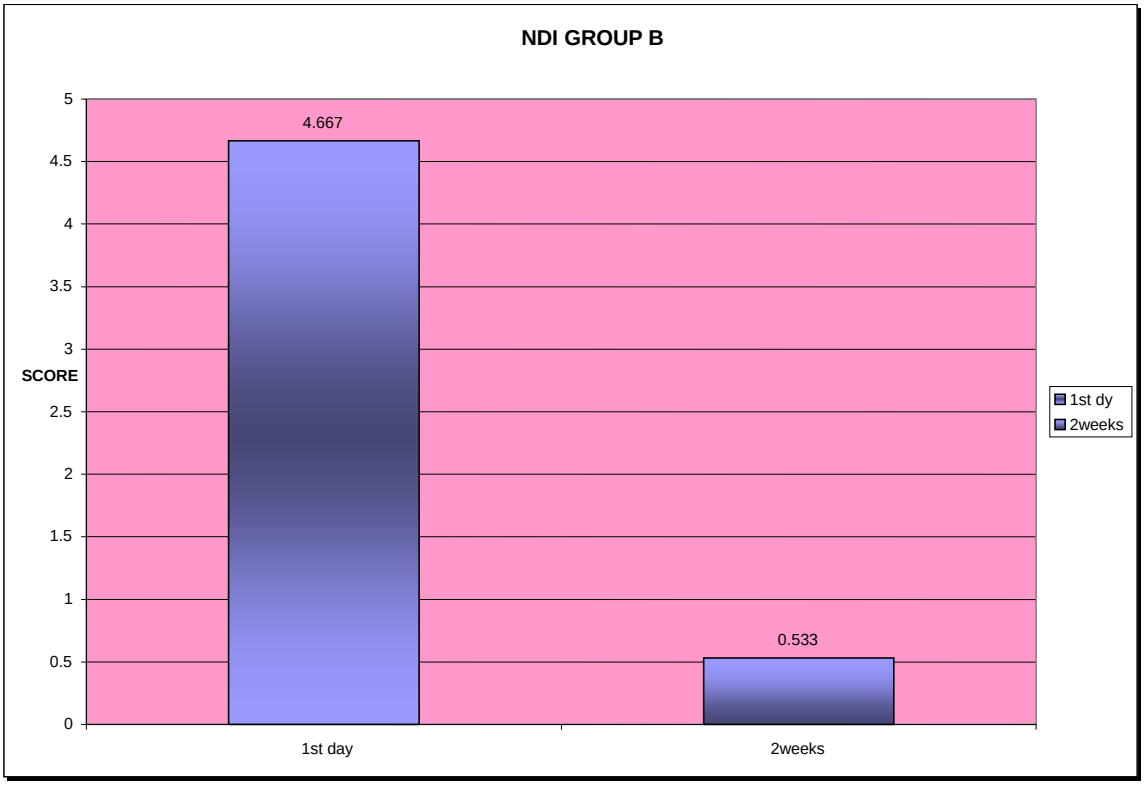
GRAPH 10



	Mean	**Standard Deviation**	**Standard error of**	**P value**

			mean	
Day 1	4.667	0.9759	0.2520	<0.0001
2 weeks	0.9333	0.533	0.1333	

It is seen from the above graph that there is reduction in Neck Disability Index score in group B (SNAGS and postural advice) over 2 weeks which is statistically significant when compared by Wilcoxon matched-pairs signed-ranks test

Calculation details
Sum of all signed ranks (W) = 120.00
Sum of positive ranks (T+) = 120.00
Sum of negative ranks (T-) = 0.000
Number of pairs = 15

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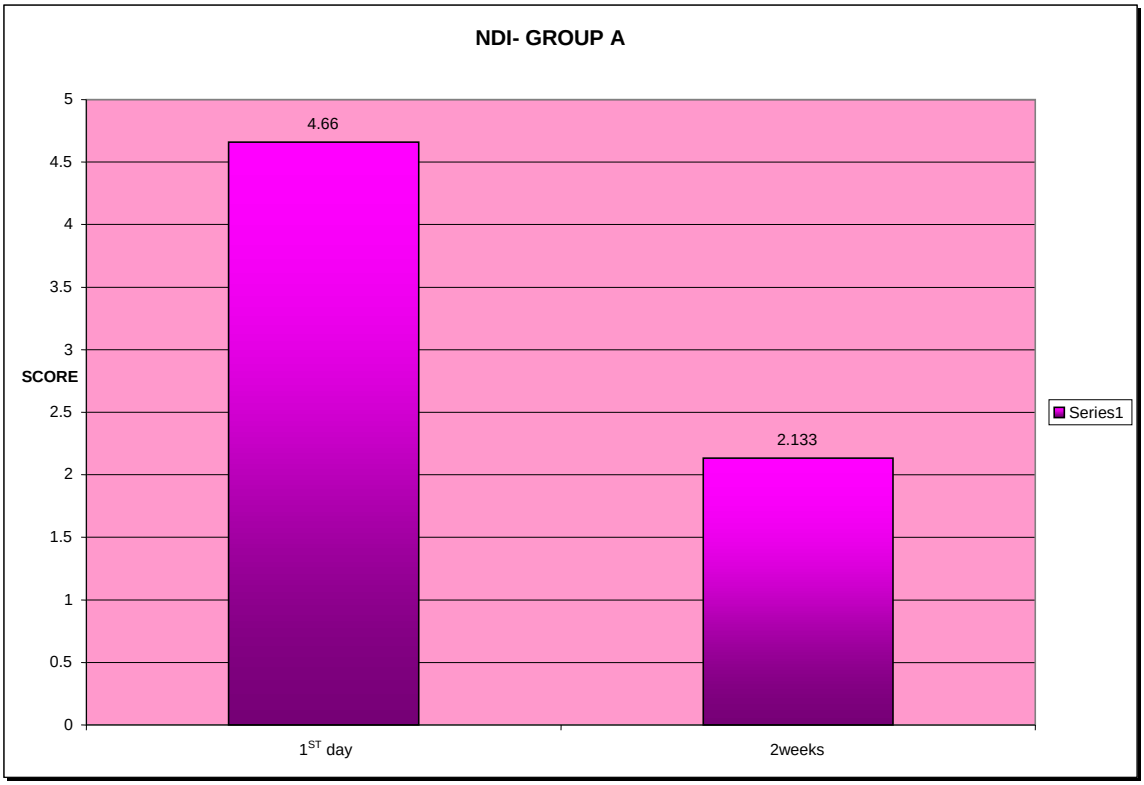
GRAPH 11



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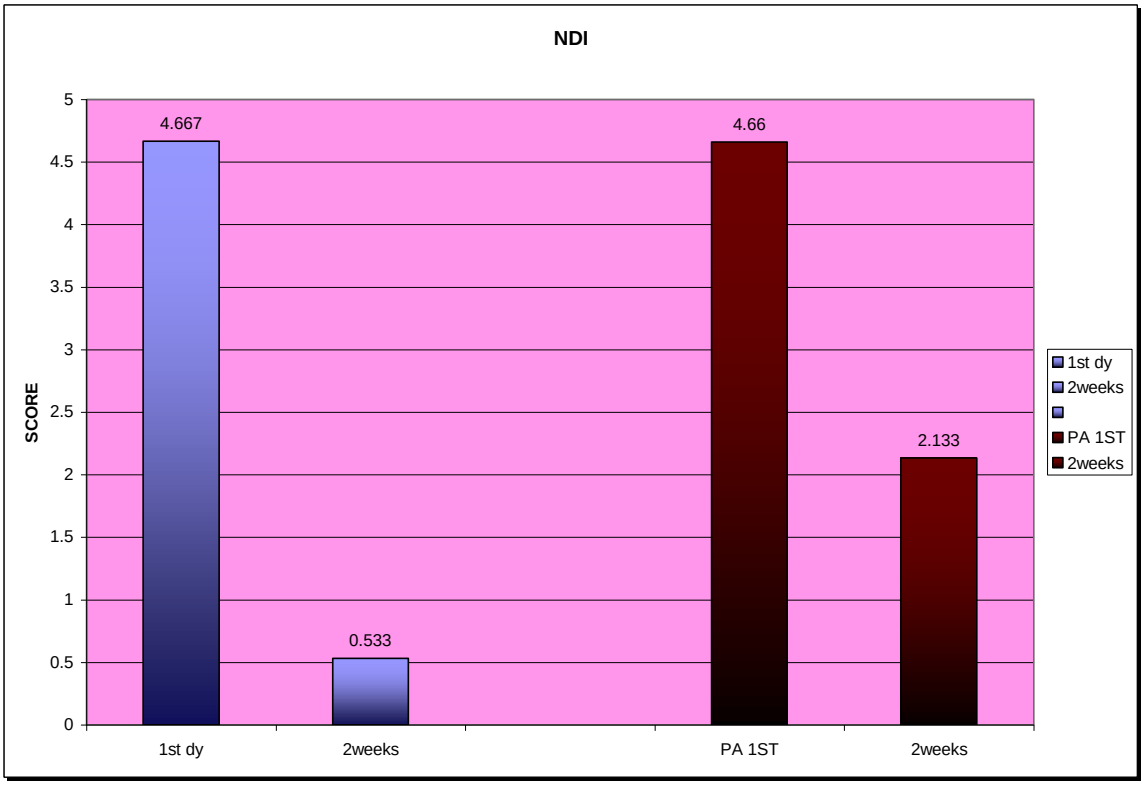
	Mean	Standard Deviation	Standard error of mean	P value
Day 1	4.66	0.9856	0.2545	<0.0001
2 weeks	2.133	0.5164	0.1333	

It is seen from the above graph that there is reduction in Neck Disability Index score in group A (postural advice) over 2 weeks which is statistically significant when compared by Wilcoxon matched-pairs signed-ranks test

Calculation details
Sum of all signed ranks (W) = 120.00
Sum of positive ranks (T+) = 120.00
Sum of negative ranks (T-) = 0.000
Number of pairs = 15

22

GRAPH 12



	Mean	Standard Deviation	Standard error of mean	P value
GROUP B Day 1	4.667	0.9759	0.2520	<0.0001
GROUP B 2 weeks	0.533	0.533	0.1333	
GROUP A DAY 1	4.66	0.9856	0.2545	<0.0001
GROUP A 2 WEEKS	2.133	0.5164	0.1333	<0.0001

When compared between the groups by Mann Whitney test, both showed significance, but group B (SNAGS and postural advice) showed better NDI score than group A (Postural advice).

Calculation details

Mann-Whitney U-statistic = 20.500

U' = 204.50

Sum of ranks in group b difference= 324.50. Sum of ranks in group a difference = 140.50.

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DISCUSSION

As seen from the graphs, there was improvement in both the groups, but group B(SNAGS and postural advice) was better in terms of reduction of pain, improvement in ROM and reduction in NDI scores when compared with Group A(postural advice).

- The probable reasons for the improvement in Group B could be the following :
  - The rationale behind Mulligan's techniques is that joints have evolved in a manner that facilitates free but controlled movement whilst minimizing compressive forces generated by movement. This balance is maintained by normal proprioceptive feedback.
  - It is postulated that these techniques "sedate an agitated, facilitated nervous system, particularly the dorsal horn, by bombarding it with the painless normality it has always been patterned to receive. Normal afferent discharge provokes a reciprocal normal efferent discharge to the structures controlling joint movement".
  - Mechano- receptors over react to sudden stretching of connective tissue 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.
  - This improvement possibly may be attributed to the fact that the accessory glide component of a cervical SNAG could ameliorate any of these problems either by separating the facet surfaces and releasing the entrapped meniscoid, or by allowing the entrapped meniscoid to return to its intra articular position, or perhaps by stretching adhesions.

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- Once the pain relieved along with the restriction there is increase in spinal movement. 24
- Application of accessory glide component of cervical SNAG may therefore reposition the superior facet superioanteriorly allowing a greater range of pain free movement.
- When a two week follow up was done, the improvement was maintained. This could be attributed to the fact that the technique was done in sitting.
- The techniques are therefore performed with the patient weight bearing - sitting if symptoms are reproduced sitting, or standing. This is because successful remedial biomechanical action done with the patient lying down is likely to be reversed when the patient stands.
- The subjects thus showed a decrease in the VAS, while their ROM improved. Thus their NDI scores were reduced, improving their functional ability.

The postural advice group also showed improvement in the outcome measures. The probable reasons could be the following:

- When erect posture is assumed, there is essentially minimal or no muscle activity needed to support the head thus lengthening the muscles.[1]
- Good posture is that body attitude which facilitates maximum efficiency of a specific activity in terms of effectiveness and energy cost without causing much damage to the body.
- Sitting in alignment reduces the strain on joints and reduces the tension on neck muscles.
- The sensory fibers from the GTO are stimulated by the tension within the tendon caused by lengthening of the

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muscle. These sensory fibers synapse with the motor neurons and transmit inhibitory impulses.[1]

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- Pain reduction could be attributed to the reflex mechanism in which the stretch of the tendinous Golgi apparatus has been found to inhibit muscular contraction.
- The Golgi reflex unloads the spindle system of the muscle. Once unloaded and relaxed, the muscle no longer produces metabolic by products of contraction, the mechanical ischemia (sustained contraction) is diminished.[1]
- There is greater venous flow as a result increasing oxygenated blood to the muscle, in turn relieving pain.
- Once the pain reduced, the neck ranges also improved though not as significantly as the group B.
- The NDI scores also improved though not so significantly as Group B.

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CONCLUSION

It is evident from the above results and the statistical analysis that SNAGS and postural advice (group B) showed better improvement in terms of reduction of pain and NDI scores and improvement in ROM as compared to postural advice group (Group A).

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LIMITATIONS

- Small sample size

SUGGESTIONS

- Study should be conducted on larger sample**.**
- Study can be conducted for longer duration i.e. the carry over effect should be studied.
- Study could be compared with other manual therapy techniques.

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SUMMARY

Aims and Objectives:

To study the effect of snags and postural advice and only postural advice on neck pain in people using computers.

Methodology:

Thirty subjects with neck pain for more than a month were recruited in the study after taking their informed verbal consent. They were evaluated with the following outcome measures prior to the intervention.
The subjects were divided into two groups of 15 each. 15 subjects were given SNAGS with postural advice while the other 15 were given only postural advice.

Group A: subjects in this group were given only postural advice.

Group B: Subjects in this group were given SNAGS and postural advice.

The outcome measures used were pain taken on a VAS scale, ROM by a measuring tape and functional outcome by NDI scale.

Results:

- When compared between the groups by unpaired t test, both showed significance, but group B (SNAGS and postural advice)

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($p<0.0001$) showed better results in VAS than group A (Postural advice).

- When compared between the groups by unpaired t test, both showed significance, but group B (SNAGS and postural advice) ($p<0.0001$) showed better ROM results than group A (Postural advice).

- When compared between the groups by Mann Whitney test, both showed significance, but group B (SNAGS and postural advice) [$p<0.0001$] showed better results than group A (Postural advice).

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Conclusion:

It is evident from the above results and the statistical analysis that SNAGS and postural advice (group B) showed better improvement in terms of reduction of pain and NDI scores and improvement in ROM as compared to postural advice group (Group A).

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MASTER CHART

GROUP B					GROUP A				
pre vas	post	6th day pre	6th post	2weeks	pre	pa post	6th pa pre	6th pa post	2pa weeks
7	6	2	1	1	6	6	4	4	4
6	6	1	0	0	4	4	2	2	2
6	5	1	0	0	5	5	4	2	2
4	4	0	0	0	4	4	2	2	2
5	5	0	0	0	6	6	5	5	3

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6	6	1	0	1	4	4	3	3	2
4	4	1	0	0	5	5	3	3	2
5	5	0	0	0	6	6	4	4	2
7	7	2	2	1	5	5	4	4	3
6	6	2	1	1	7	7	5	5	3
5	4	0	0	0	6	6	4	4	3
4	3	1	0	0	5	5	4	4	3
6	5	1	0	0	7	7	5	5	3
5	4	0	0	0	5	5	3	3	2
7	5	2	1	1	6	5	3	3	2

NDI

GROUP B GROUP A

Dy1	Dy6	2weeks	Pa dy1	Pa dy6	Pa 2weeks	snags diff	pa diff
6	1	1	4	3	3	5	1
4	1	1	5	3	2	3	3
4	1	1	4	3	2	3	2
5	1	1	5	3	2	4	3
4	0	0	6	4	3	4	3
5	1	1	3	2	1	4	2
4	1	0	4	2	2	4	2
5	0	0	5	3	2	5	3
6	2	1	4	2	2	5	2
5	1	1	6	3	2	4	4
3	1	0	5	3	2	3	3
5	1	0	4	2	2	5	2
5	1	0	6	3	3	5	3
3	0	0	5	3	2	3	3
6	2	1	3	2	2	5	1

ROM GROUP B

day 1 flex	1ext	lst day LF	1stday R	day6flex	day 6 E	day 6 LF	day 6 R	2weeks F	2w ext	2w lf	2w rot
2.2	19	10	11.1	2.4	19.1	10.6	11.3	2.4	19.1	10.6	11.3
2.3	18.6	10.5	11.2	2.4	18.7	10.6	11.5	2.4	18.7	10.6	11.5
2.4	18	10.8	11.1	2.5	18.1	10.9	11.3	2.5	18.1	10.9	11.3
2.2	19	10.7	11.3	2.3	19.2	10.8	11.4	2.3	19.2	10.8	11.4
2.5	19	11	11.4	2.5	19.1	11.2	11.5	2.5	19.1	11.2	11.5
2	19	10.5	11.1	2.2	19.3	10.7	11.6	2.2	19.3	10.7	11.6
2.2	19	11	11.2	2.3	19.2	11.2	11.3	2.3	19.2	11.2	11.3
2.3	18.9	11	11.4	2.4	19	11.1	11.4	2.4	19	11.1	11.4
2.1	17.3	11	11.3	2.2	17.5	11.1	11.4	2.2	17.5	11.1	11.4
2.1	18.6	10	11.4	2.2	18.8	10.2	11.6	2.2	18.8	10.2	11.6
2	19	10.8	11.5	2.3	19.2	10.9	11.7	2.3	19.2	10.9	11.7
2.5	18.8	10.8	11.3	2.5	18.9	10.9	11.6	2.5	18.9	10.9	11.6
2.1	18	10.8	11.1	2.3	18.5	10.9	11.4	2.3	18.5	10.9	11.4
2.2	18	10.9	11	2.4	18.4	11	11.2	2.4	18.4	11	11.2
2.5	18.8	10.5	11.1	2.5	18.9	10.7	11.3	2.5	18.9	10.7	11.3

GROUP A

1st flex	1st ext	1ST day	1st rot	6th flex	6th ext	6th lat	6th rot	2w	2we	2we	2we

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		LF				flex		eeksF	eksE	eksIf	eksR
2.3	18	10.8	11	2.4	18.1	10.9	11.1	2.4	18.1	10.9	11.1
2.2	18.8	10.6	11.2	2.3	18.8	10.8	11.2	2.3	18.8	10.8	11.2
2.4	18.9	10.8	11.1	2.4	18.9	10.9	11.2	2.4	18.9	10.9	11.2
2.2	18.8	10.7	11.3	2.2	18.8	10.7	11.3	2.2	18.8	10.7	11.3
2.1	18.7	10.2	11.2	2.2	19	10.3	11.2	2.2	19	10.3	11.2
2.3	18.9	10.8	11.1	2.3	19.1	10.8	11.1	2.3	19.1	10.8	11.1
2.4	19	11	11	2.4	19	11	11.1	2.4	19	11	11.1
2.1	19	11	11.2	2.1	19.1	11.1	11.2	2.1	19.1	11.1	11.2
2.5	18.5	10.6	11.1	2.5	18.7	10.7	11.1	2.5	18.7	10.7	11.1
2.1	18.6	10.2	11.4	2.1	18.8	10.2	11.4	2.1	18.8	10.2	11.4
2	18.8	10	11.3	2.1	18.8	10.1	11.3	2.1	18.8	10.1	11.3
2.1	18.7	10.7	11.2	2.2	18.8	10.7	11.3	2.2	18.8	10.7	11.3
2	16.7	10.5	11.2	2	16.8	10.8	11.2	2	16.8	10.8	11.2
2.2	18.8	10.7	11.1	2.3	18.9	10.7	11.1	2.3	18.9	10.7	11.1
2.3	19	10.6	11.4	2.3	19	10.7	11.4	2.3	19	10.7	11.4

Pa: postural advice
Flex: flexion
Ext :extension
Lf: lateral flexion
Rot: rotation
Dy: day