Journal of Advances and Scholarly Researches in Allied Education
Vol. XV, Issue No. 6, August-2018, ISSN 2230-7540

Effectiveness of Snags Mobilization in Chronic Mechanical Low Back Pain

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Abstract –

Objectives: To determine effectiveness of SNAGS Mobilization in Chronic Mechanical Low Back Pain.

Design: Randomized Control Trial

Methodology: A total of 40 patients were included as per inclusion criteria and randomly assigned into two groups each having 20 patients. Group A was given SNAG consisted of stretching and strengthening exercises while Group B was given Ultrasound consisted of stretching and strengthening exercises for 4 weeks, 3 sessions per week one session per day. The patient's outcome measures were assessed by visual analog scale, ODI and Goniometry of Lumbar Range of Motion. Measurements were recorded before and after the end of the treatment period.

Results: Results revealed that means and S.D of both group were significant (p=.000) statically but clinically the Group of patients treated with SNAGS along with stretching and strengthening exercises managed pain (pre=7.61±1.26, post=0.45±0.47), ODI(pre= 40±20.57 ,post= 9±4.69) and range of motion (flexion pre=31±6.01,post=52±10.12,extension pre=16±2.23,post=30±5.17 Rt side flexion pre=11±2.17,post=20±4.21 and lt. side flexion pre=10±2.85, post=21±4.33, Rt side rotation pre= 9±1.97,post=18±2.15) lt. side rotation pre=9±2.01,post=18±2.47 better than group of patient treated with Ultrasound along with stretching and strengthening exercises in terms of pain(pre=6.67±1.51,post=2.83±1.17), ODI (pre=43±21.62,post=25±12.8) and range of motion (flexion pre=25±5.95,post=37±10.56, extension pre=14±2.13,post=21±5.41, Rt side flexion pre=10± 2.15 post=15±2.28, lt Side flexion pre=12±2.75, post=18±2.96, Rt side rotation pre=9±1.90 post=15.±2.71, lt Side rotation pre=8±1.85, post=16±3.17.

Conclusion: The result of study suggests that both SNAG and Ultrasound improves the symptoms of chronic Mechanical back pain. Better improvement was shown by SNAG group than Ultrasound group. Based on these results SNAG and Exercise should be the treatment of choice for chronic Mechanical Low back pain rather than Ultrasound with Exercise.

Key Words: SNAGS, Chronic Mechanical Low Back Pain, Ultrasound, Exercise.

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INTRODUCTION

Low back pain (LBP) is a major health problem because of its high prevalence worldwide[1].

It affects almost every adult person at least once throughout his or her life span[2]. Low back pain is considered a multidimensional medical problem having multiple risk and causative factors[3,4].

Pain in region between bottom of ribs and buttock crease is referred as low back pain (LBP). Low back pain is umbrella of conditions .80% of adults estimated to experience LBP at some point during their life[5]. More than 60% of consultation in private physiotherapy clinics is because of low back pain[6]. Male and female individuals are affected equally[7] It is a major problem that causes activity restriction, work absence and financial burden on families, communities, industries and government. Diagnostic triage is use to differentiate between non spinal or

serious spinal disorder and those with pain of musculoskeletal cause by means of history and examination with special emphasis on red flags[8].

Clinical presentation can differ but majority of patients will complain pain that either centralizes or radiates to lower extremities[9].

Mechanical low back pain is a general term used to refer pain that does not have any specific cause or that is not related to any serious spinal pathology[10]. 90% of patients presenting to primary care are sufferers of mechanical low back pain and these are the majority of the individuals that present to physiotherapy. Common symptom is the pain that gets worse with activity and relieved by rest.

A wide range of managements are available, with different treatments specifically targeted toward different causes. A balanced approach, which deals with patient psychosocial factors and includes multidisciplinary care, increases the probability of success from back pain interventions[11]. Medication, physical therapy, and surgery are most commonly used managements of mechanical low back pain.

Posture involvement is evident in back pain. rule of thumb is that pain leads to bad postures and bad postures further aggravates pain[12]. When bad posture is fixed it decreases pain significantly.

Usually LBP treatment strategies focus on pain area and neglect proximal or distal areas to pain. But according to emerging concept of Regional Interdependence it is necessary to treat proximal and distal area too for better outcomes[13].

Involvement of thoracic spine posture in chronic low back pain is proved from literature but rare evidence is present on treatment of posture correction to low back pain. This study is conducted to add to literature the effects of posture correction on low back pain Effects of lumbar Mulligan sustained natural apophyseal glides on patients with nonspecific low back pain is evident in literature[14]. SNAG involves application of accessory passive glide to lumbar vertebrae by physiotherapist while patient will simultaneously perform an active movement. Glide given is in the direction of plane of facet joints and technique is usually performed in weight bearing position like standing, sitting[8,15].

METHODS:

The study was designed as Randomized Control Trial and has two groups Group A was given SNAG consisted of stretching and strengthening exercises while Group B was given US consisted of stretching and strengthening exercises. It was conducted at Physical Therapy Department of Prince Sultan Military Medical City- Riyadh Saudi Arabia.

Inclusion criteria:

- 3 months of continuous or intermittent LBP symptoms.
- Ability to perform at least 40° of trunk flexion.
- Aged 17 to 50 years.

Exclusion criteria:

- Females less than 20 and more than 60 years.
- Experiencing pain less than 03 months
- Radicular pain
- Chronic pathological pain or any surgical history of lumbar spine.
- Pregnant
- Obese
- Any contraindication to physiotherapy and manual therapy.

A total of 40 patients were included as per inclusion criteria. Patient was randomly assignment into two groups A and B with 20 patients in each group. Baseline assessment using Visual analog Scale (VAS), Oswestry Disability Index (ODI) and Goniometry was done respectively for Pain, Function and Lumbar range of motion for both groups.

SNAGS were applied in flexion, extension and rotation. SNAGS were applied for few seconds with 3 repetitions on first day and 10 repetitions from next visit. Study also included active as well as therapist facilitated stretches. Stretches were maintained for 15 -20 seconds with 10 repetitions of each stretch per session. Ultrasound is given for 8 minutes for groups B. Sessions were given 4 weeks, 3 sessions per week one session per day to both groups.

Home plan consisted of exercise therapy i.e. knee to chest, bridging, back extension exercises for both groups for 3 times a day with 10 repetitions of each exercise every day.

SNAGS Technique:

SNAG technique was applied from a sitting position on the edge of the table while both feet were on a foot rest. A specialized Mulligan belt was used around the patient's waist and therapist's hips. The mobilizing force was applied parallel to the facet joint plane (cephalic direction) and over the spinous processes of the respective symptomatic spinal levels (Fig.1). The patients were asked to lean forward as much as possible during application of the mobilizing force and then return to the starting

position while the therapist maintained his mobilizing force until the end. The symptomatic level was determined clinically by using the standardized objective examination combining active trunk movements and posteroanterior mobilization of the lumbar vertebrae. The SNAG dose for each level was SNAGS were applied in flexion, extension and rotation. SNAGS were applied for few seconds with 3 repetitions on first day and 10 repetitions from next visit 3 times per week for 4 weeks. Study also included active as well as therapist facilitated stretches. Stretches were maintained for 15 -20 seconds with 10 repetitions of each stretch per session. It was performed before the conventional program[16].

Figure 1-Start and end positions for lumbar sustained natural apophyseal glide (SNAG).

Ultrasound treatment procedure and technique

Before starting treatment a consent form was given to patients and benefits and risks of procedure including sensations expected during procedure were explained to them. They were positioned (lying) with additional pillow support comfortably and assessed thoroughly. Time and intensity was kept at '0' before switching on power. Patients were also instructed to report any excess heat or pain. Gel is applied to skin and surface of transducer. US head is moved in overlapping circles, rate of transducer movement is slow, maximum 3-4cmsq. Dose of US was 1w/cm^2 with frequency of 1MHz in continuous mode, 1MHz was chosen due to its increased penetration depth. Treatment lasted eight minutes over the paravertebral low back region[17].

Exercise therapy:

Exercise therapy appears to be slightly effective for decreasing pain and improving function in adults with chronic LBP. The intervention included 12 stretching exercises (i.e., gastrocnemius, soleus, quadriceps, posterior and inferior shoulder, upper trapezius, hip flexor, back extension, back rotation, hamstrings, hip external rotators, back flexion), plus 3 additional stretches (hip internal rotators, hip adductors and hip flexors). Each stretching exercise was held for approximately 60 seconds and repeated once. In addition to a complete set (15) of full-body stretches, the class began with five minute warm-up period consisting of basic aerobics steps (i.e., one minute each of walking in place, marching, lateral shuffling, turning and reaching, and box step) and also included four exercises to strengthen back, abdomen and hips (i.e., squats, crunches, oblique crunches, back extensions)[17] .

Data Analysis:

Data was analyzed with SPSS 20. Outcome measures were calculated as mean and standard deviation and compared by using paired and independent sample t-test. P-value of less than 0.05 was taken as significant. The study was approved by PSMMC Ethical Review Committee and Physical Therapy Department of PSMMC. Informed consent was taken from all patients before enrollment in the study to assure willingness, confidentiality of information and to aware the patients about all procedure and interventions.

RESULTS:

In this study 40 patients participated with a mean age of 46.35±14.31 in group A and 45.55±15.30 in Group B ranging from 17 to 50 years (Table 1).

	Group A (N=20) Mean±SD	Group B (N=20) Mean±SD
Age (Yrs)	46.35±14.31	45.55±15.30

Table 1: Mean and SD of age between group A and B

Mean reduction in VAS

Both groups had significant difference in pre R_x to Post R_X values as t and p values for group A and B were t=18.96, p=0.000 and t=12.17,p=0.000 respectively (table 4).

Groups	Pre R_X	Post R_X	Pre R_x to Post R_X		
			Mean±SD	Paired t value	p value
Group A (N=20) Mean±SD	7.61±1.26	0.45±0.47	6.51±1.28	18.96	0.000
Group B (N=20) Mean±SD	6.67±1.51	2.83±1.17	2.97±0.89	12.17	0.000

Table 2: Mean reduction in VAS values between group A and B. Mean and standard deviation at pre R_X, Post R_X and pre R_X to Post R_X with t and p values.

Mean reduction in ODI

Groups	Pre R_X	Post R_X	P Value
Group A (N=20) Mean±SD	40±20.57	9±4.69	0.000
Group B (N=20) Mean±SD	43±21.62	25±12.8	0.000

Both groups had significant difference in pre R_x to Post R_X p=0.000 respectively

Groups	Pre R_X	Post R_X	P Value
Group A (N=20) Mean±SD	40±20.57	9±4.69	0.000
Group B (N=20) Mean±SD	43±21.62	25±12.8	0.000

Table 3: Mean reduction in ODI values between group A and B. Mean and standard deviation at pre R_X, Post R_X and pre R_X to Post R_X with p values.

Mean reduction in ROM

Both groups had significant difference in pre R_x to Post R_X p=0.000 respectively

ROM	Group A (N=20) (Mean±S.D)		Group B (N=20) (Mean±S.D)		p-value (<0.05)
	Pre R_X	Post R_X	Pre R_X	Post R_X	
Flexion	31±6.01	52±10.12	25±5.95	37±10.56	.001
Extension	16±2.23	30±5.17	14±2.13	21±5.41	.000
Rt. Side flexion	11±2.17	20±4.21	10±2.15	15±2.28	.001
Lt. Side flexion	10±2.85	21±4.33	12±2.75	18±2.96	.000
Rt. Rotation	9±1.97	18±2.15	9±1.90	15±2.71	.000
Lt. Rotation	9±2.01	18±2.47	8±1.85	16±3.17	.000

Table 4: Mean reduction in ROM values between group A and B. Mean and standard deviation at pre R_X, Post R_X and pre R_X to Post R_X with p values.

DISSCUSION:

A study was done to investigate effects of SNAGs mobilization consisted of stretching and strengthening exercises to lumbar stabilization exercises in patients of chronic low back pain. 40 subjects with chronic low back were recruited. Balance, stabilization and pain were assessed. Results of this study concluded that there are greater effects on SNAGs of lumbar region, pain relief and improvement of function consisted of stretching and strengthening exercises combined with thoracic mobilization were given to patients of CLBP. Results of this study favors this study results of decrease of pain levels and increase in functional levels when SNAGs mobilization consisted of stretching and strengthening exercises was given for back pain[18].

Another study conducted to find out effects of thoracic manipulation and mobilization on function and mental state of patients of CLBP. Thirty-six

subjects were randomly divided into mobilization group, manipulation group and control group. Outcome of study showed that mobilization or manipulation to thoracic lumbar vertebrae has a positive effect on function, mental state, and ROM in patients with lower back pain. Conclusion of this study also supports current study that ROM and functional level increases when thoracic intervention was given for LBP[19].

The results on RE agreed with previous a previous recommendations.This study investigated the effects of another manual technique (Gong's mobilization) on RE. The comparison between both studies was not accurate because the Gong study was performed on healthy participants, whereas the present study was conducted on chronic nonspecific LBP patients.[20]

Lumbar degenerative kyphosis (LDK) is condition in which there is kyphosis or marked loss of lumbar lordosis. It is common in middle aged and elderly population due to degenerative conditions. A retrospective study was done to establish post-surgical co relation between thoracic and lumbar sagittal curves in LDK. Reciprocal relationship was found between lumbar lordosis and thoracic kyphosis. Surgical correction of lumbar lordosis in LDK shows significant improvement in thoracic kyphosis[21].

Exercise therapy is one promising treatment option, but there is still no consensus upon which kind is the most effective [22].

Therapeutic Ultrasound as one of the most popular and commonly used modalities in the field of physiotherapy for LBP patients[17].

Several studies have supported that effectiveness of therapeutic US, a widely used physiotherapeutic agent, in the management of musculoskeletal diseases either alone or in combination or in comparison with other physiotherapeutic agents[23,24].

Briefly it can be summarized that there exist evidence on SNAGs consist of stretching and strengthening exercises involvement in low back pain.so if SNAGs along with stretching and strengthening exercises treatment for low back pain is given it will lead to better outcome measures. This study favors same conclusion that when SNAGS consist of stretching and strengthening exercises were given better results were obtained in terms of pain reduction, improved function and increased ranges of lumbar spine.

CONCLUSION:

This study provides evidence that adding lumbar SNAG to a conventional LBP program consisting of stretching and strengthening exercises is more effective in the treatment of mechanical LBP in terms of RE, pain, and functional level.

LIMITATIONS:

However there were few limitations that hinderd more accurate results such as the sample size was small consisting of only females. Similarly duration of study was short which leads to investigate short term effects only.

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