STRAIN COUNTER-STRAIN VS DRY NEEDLING ON PAIN AND RANGE OF MOTION IN FROZEN SHOULDER: A RANDOMISED CLINICAL TRIAL

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MASTER OF PHYSIOTHERAPY (M.P.T)

In

ORTHOPEDICS

Under the guidance of

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2021-2023

DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled **STRAIN COUNTER-STRAIN VS DRY NEEDLING ON PAIN AND RANGE OF MOTION IN FROZEN SHOULDER: A RANDOMISED CLINICAL TRIAL** is a bonafide and genuine research work carried out by me under the guidance of **Prof. ASIFUZZAMAN SHAHRIYAR AHMED**, Abhinav Bindra Sports Medicine and Research Institute, Odisha.

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LIST OF ABBREVIATIONS

1. **ABSMARI -** Abhinav Bindra Sports Medicine and Research Institute
2. **ABD –** Abduction
3. **DN –** Dry Needling
4. **ER –** External Rotation
5. **FS -** Frozen Shoulder
6. **ROM –** Range of Motion
7. **SCS –** Strain Counter-strain
8. **SD –** Standard Deviation
9. **SPSS –** Statistical Package for Social Science
10. **TrPs –** Trigger Points

LIST OF TABLES AND GRAPHS

TABLE OF CONTENTS

ABSTRACT

Strain counter strain vs Dry needling on pain and range of motion in frozen shoulder – A randomized clinical trial

Background: The aim of this study is to treat the muscle trigger points with strain counter strain technique and dry needling i.e., using both invasive and noninvasive techniques.

Objectives: To compare the effects of subscapularis muscle trigger point dry needling (DN) versus Strain counter-strain technique (SCS).

Study Design: Randomized clinical Trial.

Method: 20 study subjects with frozen shoulder and trigger points over subscapularis muscle were assigned to 2 groups and received 3 weeks of treatment of DN (n=9) and SCS (n=11). Pain response and range of motion were measured at baseline, post intervention and after 2 weeks follow up.

Results: The statistical analysis showed a significant improvement in pain in both the groups ($p < 0.000$). There is also significant improvement in abduction ($p < 0.000$) and external rotation ($p < 0.000$) within both the groups. Between group analysis shows no difference in pain ($p > 0.302$), abduction ($p > 0.084$) and external rotation ($p > 0.739$).

Interpretation and Conclusions: There were no difference between the SCS and DN group in any of the outcome measures. SCS shows clinically better improvements in abduction range of motion.

INTRODUCTION

Frozen shoulder (FS) is a very common condition of the shoulder joint which limits the function. It is characterized by pain and gradual loss of range of motion (ROM). This painful and disabling condition can lasts for several weeks [1,2,3]. The prevalence of FS has been reported to range from 2% to 5% in general population and women are more affected than men [2]. FS could be primary or secondary in types. Primary FS is said to be occurred when there is no underlying etiology is found, whereas secondary FS is associated with any known underlying etiology such as previous injury to the shoulder or prolonged rest. Frozen shoulder occurred in 3 different stages: freezing, frozen and thawing. The first freezing stage is painful and characterized by an acute synovitis of the glenohumeral (GH) joint which lasts between 3 to 9 months. There is an increased night pain in this stage. The second frozen stage is referred to as the stiffness stage is accompanied by a decrease in shoulder ROM and decrease in pain. This stage lasts between 4 to 12 months. The capsular pattern is reduced external rotation (ER) followed by abduction (Abd) followed by internal rotation. The third stage is when there is a gradual improvement in shoulder ROM and minimal pain. This thawing stage lasts from 12 to 42 months [2,3].

In FS, initially there is inflammatory processes which can be due to response to any injury or an infectious agent or an autoimmune reaction. This inflammatory process acts as a precursor for capsular fibrosis and contracture which is seen in later stage. Capsular fibrosis can cause thickening of long head

of biceps, coraco-humeral ligament and the axillary recess resulting in capsule volume reduction [4].

The FS is a muscular dysfunction model rather than an adhesion model (Tavell and Simons, 1999). Among all the shoulder girdle muscles, it has been shown that if the subscapularis muscle was shortened because of myofascial dysfunction, it could show the features of frozen shoulder. If there will be any poor length tension relationship due to various causes such as scapular malalignment, trauma, prolonged immobilization of shoulder joint, muscle over use can lead to muscle imbalance or dysfunction causing trigger points (TrPs). According to Travell and Simons, TrPs in muscles like latissimus dorsi, pectoralis major and minor, anterior deltoid and teres minor could limit the external rotation (ER) or abduction (ABD), but not as severe as the subscapularis. Hence there is an strong association between the subscapularis muscle trigger point and frozen shoulder (M.V. Arjun, S. Rajasekhar, 2021). [4,5]

Trigger points are defined as focal, hyperirritable spots in a taut band of a skeletal muscle. Palpation of TrPs causes referred pain and local twitch response. Trigger points are either active or latent. Active TrPs can cause pain at rest and present a referred pain pattern on palpation whereas latent TrPs only produces pain when palpated or pressure is applied. Both the TrPs can gives raise to muscle imbalances, inhibition, increased motor irritability and altered muscle recruitment. [4,6]

Treatment includes pharmacological and nonpharmacological managements. Pharmacological treatment includes analgesics and nonsteroidal anti-

inflammatory drugs (NSAIDs) to reduce pain. Nonpharmacological methods of treatment are dry needling (DN), trigger point injection, osteopathic manual techniques, massage, application of heat or cold, transcutaneous electrical nerve stimulation, ethyl chloride spray, stretch techniques. [6]

Among all these treatment methods there is strong evidence of DN to have a positive effect on pain intensity and moderate evidence present for improving ROM [7,10]. There are evidence suggests a superior effect of DN in decreasing pain when applied in TrPs [8].

Strain counter strain (SCS) technique is one of the commonly used osteopathic manipulative technique, also known as positional release, have been shown to have good effects in reducing muscle pain [9]. SCS can be helpful in deactivation of muscle TrPs and improvement in pain [11].

Need of the study:

DN and SCS techniques has been shown to have significant effects on relieving muscle pain related to trigger point. Research shows there is an immediate improvement of pain by using both the techniques but there is less evidence for long term effects of DN as well as SCS techniques.

There has been lack of evidence on comparison between these two techniques on muscle TrPs.

There has been lack of evidence for long term effects of both SCS and DN while applied on muscle trigger points.

Aim of the study:

- Aim of this study is to compare the SCS and DN in improving pain and ROM (ER and ABD) while applying on subscapularis TrPs in patients with frozen shoulder.

OBJECTIVES

- To compare the effects of SCS and DN in improving pain by using visual analogue scale (VAS).
- To compare the effects of SCS and DN in improving ROM by using mobile inclinometer.

Hypotheses:

- **Null Hypothesis**

There will be no significant improvement between the base line data and short term and long-term data while applying DN.

There will be no significant improvement between the base line data and short term and long-term data while applying SCS.

There will be no significant difference between the SCS and DN groups.

- **Alternate Hypothesis**

There will be significant improvement between the base line data and short term and long-term data while applying DN.

There will be significant improvement between the base line data and short term and long-term data while applying SCS.

There will be significant difference between the SCS and DN groups.

REVIEW OF LITERATURE

- **M V Arjun and S Rajasekar (2021),** in journal of bodywork and movement therapies conducted a study on Association between subscapularis trigger point and frozen shoulder: A cross sectional study with 143 subjects and concluded that there appears to be a strong association between subscapularis trigger point and frozen shoulder.

- **E Segura-Orti et, al (2016),** in journal of sage conducted a study on Trigger point dry needling versus strain counter strain technique for upper trapezius myofascial trigger points, with 34 subject and with outcomes of VAS, neck disability index and concluded that there is no significant difference between SCS, Sham SCS and Dry needling. Future studies are required to confirm where there are difference between the techniques studied.

- **Pinakin Godse, Seema Sharma and Tushar J. Palekar (2012) in Indian Journal of Physiotherapy & Occupational Therapy** conducted a study on Effect of Strain-Counterstain Technique on Upper Trapezius Trigger Points with 24 subjects with VAS and Neck disability index and concluded that Strain- Counter-strain technique is useful in relieving the pain and improving functional abilities in patients with active myofascial trigger points in upper trapezius.

- **Ismail Oguz dayanir et al, (2020), in the journal of alternative and complementary medicine,** conducted a study on Comparison of three manual therapy techniques as trigger point therapy for chronic nonspecific low back pain with 48 subjects with outcomes of VAS, muscle trigger point examination, pressure pain threshold, lumbar active range of motion and concluded that SCS shown better improvement in pain during activity, deactivation of trigger points, and disability related to pain in chronic nonspecific LBP .

- **Barbara Cagnie et al (2015);** Conducted a systematic review to describe the effects of ischemic compression and dry needling on trigger points in upper trapezius muscle in patients with neck pain and to compare these two interventions and found that there is moderate evidence of ischemic compression and strong evidence for dry needling to have a positive effect on pain intensity.

- **Lynn H Gerber et al (2015);** Conducted a study to determine whether dry needling of an active myofascial trigger point reduces pain and alters the status of trigger point or not. They found that it reduces pain and changes trigger point status.

- **Brian C Werner et al (2014) in journal of shoulder and elbow surgery** conducted a study on validation of an innovative method of shoulder range-of-motion measurement using a smartphone clinometer application with 24 subject and comparing the clinometer with goniometry and the ICC value with 0.98. This study concluded that the smartphone clinometer has excellent agreement with a goniometry-based gold standard for measurement of shoulder ROM in both healthy and symptomatic subjects.

- **Ahmad H Alghadir et al (2018) in journal of pain research** conducted a study on Test–retest reliability, validity, and minimum detectable change of visual analog, numerical rating, and verbal rating scales for measurement of osteoarthritic knee pain with 121 subject with test retest reliability of VAS, NRS and VRS was assessed during two consecutive visits in a 24 hours interval and find out the ICC value of VAS is 0.97, NRS is 0.95 and VRS is 0.93. This study concluded that the VAS is most reliable in the measurement of OA knee pain.

METHODOLOGY

Study design - Randomized clinical trail

Study population - Patients with Adhesive capsulitis

Study sample - Purposive sample

Sample size - 30

Study setting - Private clinics, Bhubaneswar

Study duration - 6 months

Selection criteria

- **Inclusion criteria:**
  - Age group - more than 35 years
  - Gender - Both males and females
  - Patient with adhesive capsulitis with VAS score above 4
  - Patient with adhesive capsulitis with range of motion below 90 of abduction and less than 30 of external rotation
  - Patients with adhesive capsulitis who are giving consent.
- **Exclusion criteria:**
  - Recent musculoskeletal injury such as fracture of humerus, clavicle, ribs and muscle tear around shoulder, shoulder dislocation.
  - Paresthesia around shoulder due to any neurological condition
  - If there is any communicable disease present.
  - Patient with trypanophobia (fear of needle).

Study materials

- Dry needles
- Mobile Inclinometer
- Mobile holding strap

Outcome measure

- Primary outcome: - Visual Analog Scale (VAS) [15]
- ICC value – 0.97
- Secondary outcome: - Mobile Inclinometer [16]
- ICC value- 0.98

Sample Selection And Randomization

The institutional ethical committee evaluated and approved the current study. A total of 29 samples were screened by using purposive sampling. 22 participants were selected based on inclusion and exclusion criteria and 7 subjects were excluded. They were chosen for this study based on certain criteria, such as having VAS score above 4cm and range of motion below 90 of abduction and less than 30 of external rotation. Everyone who participated in the study was informed of the protocol and their informed consent were taken.

Groups allocation was done by using block randomization.

11 subjects were placed in group A (SCS)

11 subjects were placed in group B (DN)

Procedure:

Baseline assessment was taken which includes VAS and ROM (Abduction and External rotation).

Pain was measured by using visual analogue scale, in which there is a 10 cm or 100 mm line drawn on a paper with mentioned only the 0 and 10. Participants were informed that 0 is no pain and 10 is unbearable pain and were asked to mark on the line according to their pain perception. Then the marked point was measured using a scale and was noted.

Range of motion (abduction and external rotation of shoulder joint) were measured using a mobile clinometer app. The mobile phone was wrapped on

the movable arm and the participants were asked to actively do the motion and the mentioned range in the inclinometer was noted.

All the groups did some range of motion exercises such as finger ladder exercise, Codman's exercise, scapular elevation and retraction, active flexion, abduction, internal and external rotation of both the arms prior to the intervention.

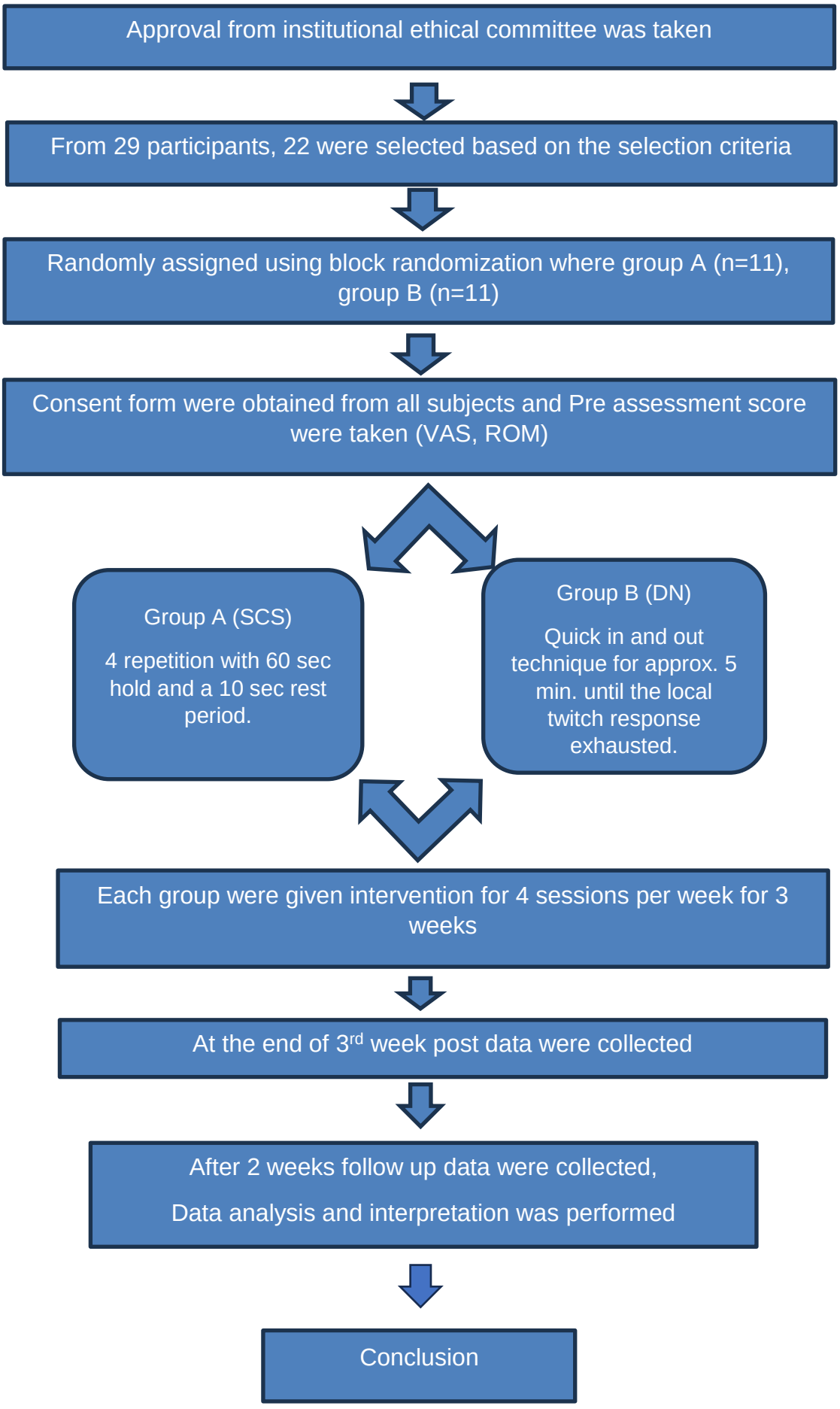
Both the groups took their respective interventions. Group A undergone with SCS and group B undergone with dry needling.

Group A subjects took intervention 4 sessions per week for 3 weeks. The investigator palpates the trigger point on subscapularis muscle under the arm pit, then compress the trigger point with his thumb and then placed the muscle in a shortened position that is in adducted and internally rotated position for 90 seconds. 4 repetition of 60 seconds hold with 10 second rest was conducted in each session of treatment.

Group B subjects took intervention 4 sessions per week for 3 weeks. For dry needling, stainless steel acupuncture needles (0.22 mm diameter, 25 mm length. Tian Xie acupuncture needles) were used. A quick "in and out" technique was preferred to ensure a subscapularis local twitch response and to promote effectiveness. Needling at the specific trigger point was continued until the local twitch response was exhausted. [12]

Both the groups continued their respective interventions for 3 weeks. After completion of the 3 weeks, post-intervention data were assessed. Then after a period of 2 weeks the follow-up data were assessed.

For both the groups data were analyzed. The difference between baseline and post intervention, post intervention and follow-up data within the group was assessed using repeated measured ANOVA. The difference between the two groups was assessed by independent t- test.


Approval from institutional ethical committee was taken
From 29 participants, 22 were selected based on the selection criteria
Randomly assigned using block randomization where group A (n=11), group B (n=11)
Consent form were obtained from all subjects and Pre assessment score were taken (VAS, ROM)
Group A (SCS)
4 repetition with 60 sec hold and a 10 sec rest period.
Group B (DN)
Quick in and out technique for approx. 5 min. until the local twitch response exhausted.
Each group were given intervention for 4 sessions per week for 3 weeks
At the end of 3rd week post data were collected
After 2 weeks follow up data were collected,
Data analysis and interpretation was performed
Conclusion

SAMPLE SIZE ESTIMATION

Sample size calculation was done by using the formula for experimental studies.

(Outcome – Modified T test)

$n = 2k\ SD^2 / d^2$

where,

n = Number of samples

k = Power

SD = Standard Deviation

d = MCID value

So, $2k\ SD^2/d^2$

$= 2 \times 10.5 \times (0.92)^2/ (1.8)^2$

$= 21 \times 0.63$

$= 13$

2 Dropout added, hence 15 in each group.

Total sample size = 30

RESULTS

Statistical Analysis

Data was analyzed using statistical package SPSS 29.0 (SPSSInc, Chicago, IL) and level of significance was set at $p<0.05$ Descriptive statistics was performed to assess the mean and standard deviation of specific groups. Normality of the data was assessed using Shapiro-Wilk test. Interferential statistics to find out the difference within groups was done using repeated measure ANOVA. Analysis between two groups using Independent T-test.

Table 1.1 Demographics and base line Characteristics (Mean & SD)

	Group A (SCS)	Group B (DN)
Age	52.5 ± 6.7	54.8 ± 7.4
M/F	5/6	2/7
VAS	59.0 ± 11.7	60.89 ± 8.4
Abduction (ABD)	69.6 ± 10.8	75.0 ± 5.8
External Rotation (ER)	19.8 ± 6.1	21.8 ± 3.3

Table 1.2 Within and Between Group analysis for Outcome measure 1 (VAS)

	Baseline	Post intervention	Follow-up	P value	Mean Difference	P value
Group A	**49.90**	**17.36**	**9.45**	**0.000**	**4.879**	**0.302**
Group B	**60.89**	**22.22**	**16.22**	**0.000**		

Graph 1.1 (VAS)

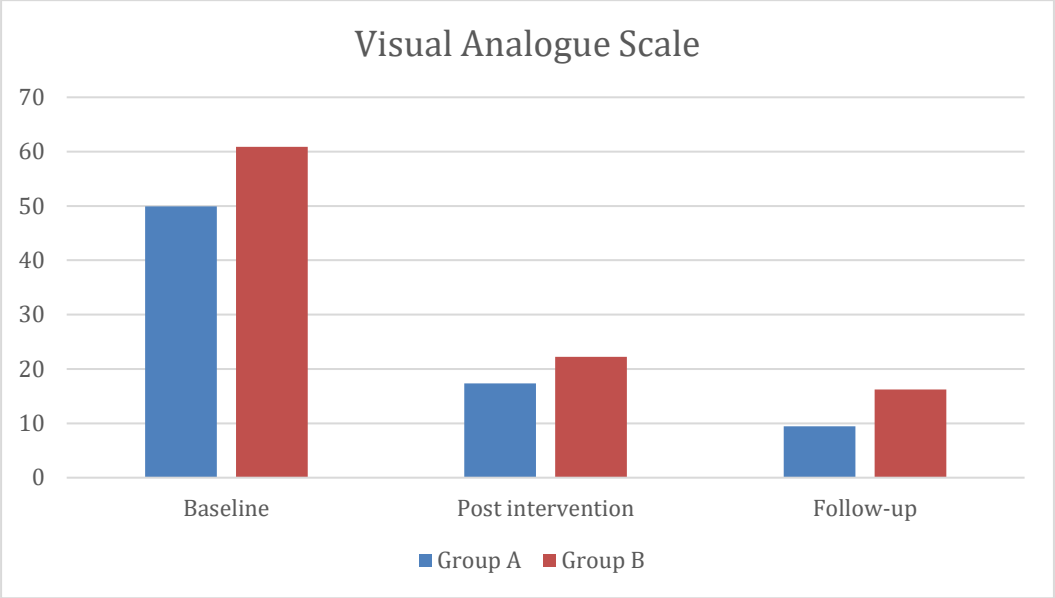


Table 1.3 Within and Between Group analysis for Abduction (ROM)

		Baseline	Post intervention	Follow-up	P value	Mean Difference	P value
Group A	ABD	69.63	151.36	157.28	0.000	11.868	0.084
Group B	ABD	75.00	147.56	150.78	0.000		

Graph 1.2 (Abduction)

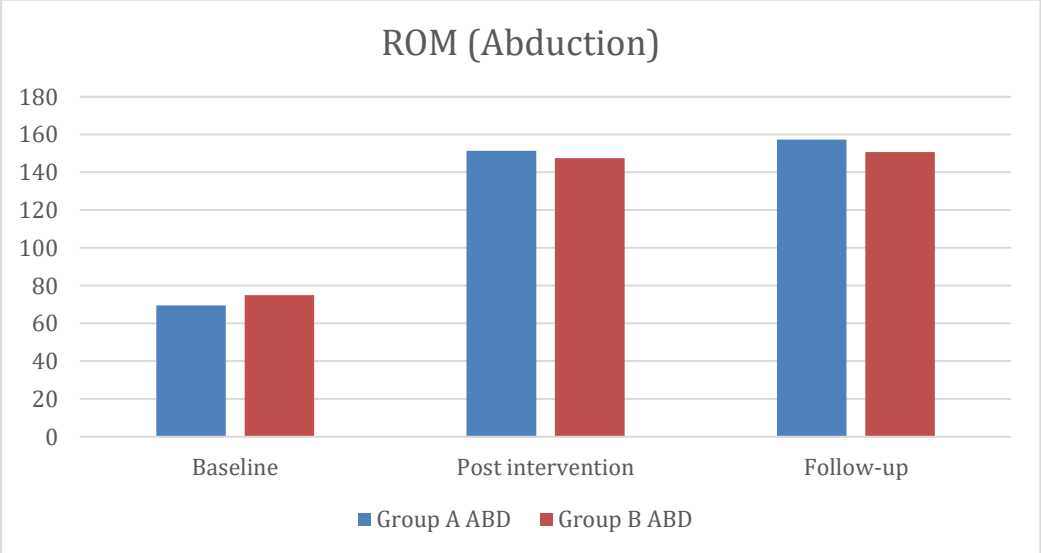
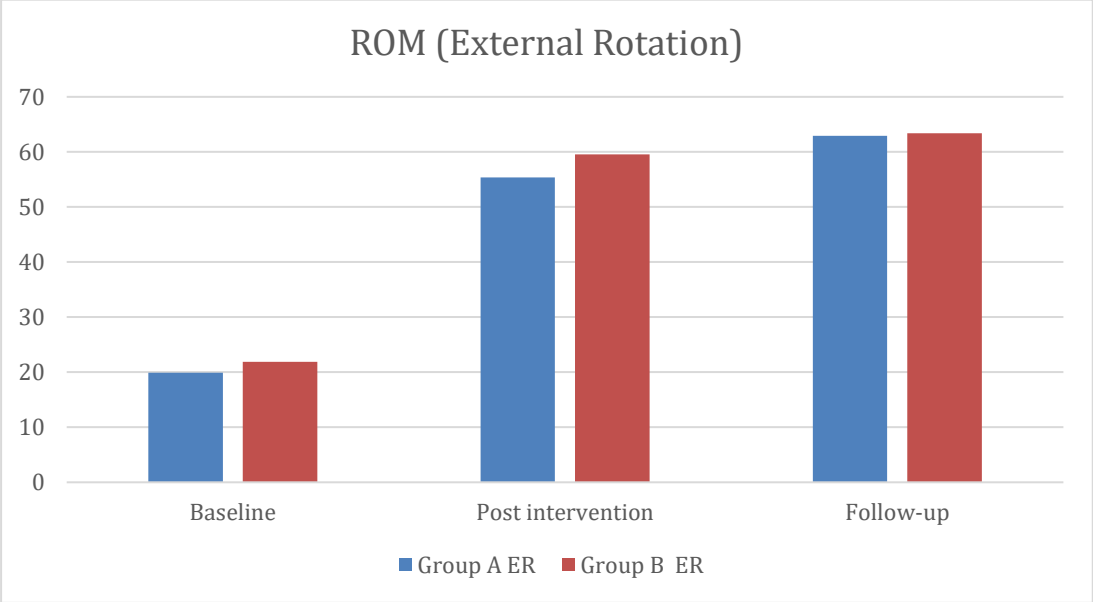


Table 1.4 Within and Between Group analysis for External Rotation (ROM)

		Baseline	Post intervention	Follow-up	P value	Mean Difference	P value
Group A	ER	19.89	55.36	62.92	0.000	1.492	0.739
Group B	ER	21.86	59.56	63.40	0.000		

Graph 1.3 (External Rotation)



DISCUSSION

The present study investigated the effects of strain counter-strain technique and dry needling on pain and range of motion of shoulder joint while applying on subscapularis muscle in frozen shoulder patients, by utilizing a randomized clinical trial design. Both the treatment groups showed statistically significant reduction in pain and improvements in ROM, in agreement with previous reports [7 – 11]. However, there is insignificant difference between the groups.

Previous studies suggest that SCS is effective in reducing pain at rest [17], but we found that it is also effective in the long term after a 2-week follow-up. There is evidence that it may be effective up to 1 week follow-up [18]. The SCS group showed significant improvement from ROM after the procedure [19,20]. Marzouk A. Ellythy et al. concluded that the use of SCS can be effective in reducing joint hypomobility [21]. The study by Ismail Oguz Dayanir et al (2020) showed that SCS improved pain with activity, trigger point deactivation, and pain-related disability in chronic nonspecific low back pain [11].

Lynn H Gerber et al (2015); found that DN reduces pain and changes trigger point status [10]. Barbara Cagnie et al (2015); conducted a systematic review and concluded that there is strong evidence that dry needling has a positive effect on pain intensity. There is evidence that DN can also improve ROM by reducing spasticity [22]. DN can improve shoulder ROM, pain intensity, and shoulder disability after 12 days of intervention [23].

Currently, the mechanism by which SCS and DN improve resting and evoked pain is still under debate. Gate control theory may explain how inhibitory controls modulate the sensory relay system at the level of the spinal cord.

Peripheral sensitization is the process by which nociceptive nerve endings show an increased response to released substances when pain persists for a few days. Central sensitization is defined as an increase in the responsiveness of central neurons to input from nociceptive terminals. Central sensitization can alter, distort, or amplify nociceptive information in ways that no longer directly reflect the specific quality and quantity of peripheral noxious stimuli but rather the functional state of circuits in the central nervous system (CNS). C-fibers relay nociceptive information, but mechanical allodynia is relayed to the CNS by low-threshold Aβ-myelinated fibers. Sustained nociceptive stimulation of TrPs could trigger a widespread central sensitization response because muscle TrPs are peripheral sources of sustained nociceptive input that can excite muscle nociceptors and thereby induce neuroplastic changes in the dorsal horn of the spine and brainstem. Therefore, both SCS and DN reverse neuropathic changes by eliminating a constant and intense source of nociception. Because all 2 groups received palpation of TrPs, it is possible that this resulted in pain reduction, as diagnostic palpation per session can increase the pain threshold for trigger points and lead to pain reduction. [12]

Strain Counter-strain act at the cellular level to relieve pain, somatic dysfunction, and limited range of motion by acting on muscle spindles, Golgi tendon organs, and inflammatory pathways.

Proprioceptors are end organs that sense physical changes in musculoskeletal tissue, muscle length, joint position, and tendon tension.[24] Proprioceptors are important contributors to somatic dysfunction, limited range of motion, and tender points. Tender points and muscle pain appear to be caused by abnormal neuromuscular activity induced by spindle fibers and activation of

nociceptors.[25] Muscle spindles, a mechanosensory receptor, inform the CNS of the contractile status of each muscle required to maintain stable posture and movement.[26][27] Each spindle contains multiple thin muscle fibers (intrafusal fibers), primary type 1a sensory fibers, type II sensory fibers, and fusimotor neurons composed of gamma and beta motor neurons.[24][28] The muscle spindle is enclosed in a connective tissue sheath and runs parallel to the muscle fibers in the muscle. When a muscle stretches, type 1a and type II sensory fibers fire at increased frequency to indicate the velocity and stretched length, respectively. The signal is transmitted to the dorsal root and monosynaptically to the alpha motor neurons of the muscle fibers surrounding the muscle spindle to trigger a muscle contraction and stop the stretch, as seen in the stretch reflex. Conversely, when a muscle contracts, the firing rate of the muscle spindle slows down, and the resulting muscle contraction decreases because the number of excitatory signals triggered by the alpha motor neurons decreases.[28][30][31]

Intrafusal fibers, the thin muscle fibers in the muscle spindle, can amplify the strength of the afferent signal generated when the muscle stretches and the intrafusal fibers contract, rather than being at rest. The CNS can change the tone of the intrafusal fibers of the spindle and fine-tune the stretch reflex, which is the extent to which the muscle can and should contract at a given length. The constant change in intrafusal fiber length is achieved via gamma neurons and is referred to as "automatic gain control." Gamma neurons are efferent lower motor neurons that regulate the contraction of intrafusal fibers and are solely responsible for the tonicity of intrafusal fibers, thereby influencing the stretch reflex. Gamma neurons are also responsible for the tonicity of intrafusal fibers, thereby influencing the stretch reflex. Golgi tendon organs are

proprioceptors/mechanoreceptors found in tendons and joint capsules that inform the CNS about the tension/force generated by muscle contraction, not about stretch. Fast-conducting type Ib afferent fibers innervate Golgi tendon organs and transmit them directly to the dorsal horn, where they form synapses with inhibitory interneurons that act on motoneurons to inhibit continued contraction of the muscle attached to the tendon in question. The inhibitory signal generated by the Golgi tendon organ (GTO) to reduce the excitability of efferent motoneurons and decrease contractile force is referred to as the Golgi tendon reflex, autogenic inhibition, or inverse stretch reflex. [24][28][32][33] Thus, SCS can improve the ROM.

The DN is most effective when a local twitch response is elicited. It has been demonstrated that DN in the region of a trigger point can effectively suppress spontaneous electrical activity (which can be studied with EMG) when local twitches are elicited. Again, sufficient mechanical needling in the region of the endplate causes muscle fibers to discharge, resulting in a local twitch response. [34] Baldry mentioned that a local twitch response causes a change in the length and tension of muscle fibers and stimulates mechanoreceptors such as Aβ–fibers. [35] Because it can change the length and reduce the pain at a muscle TRP, it can improve the limited range of motion at joints due to muscle dysfunction associated with TrPs.

We found that there was no statistical significance between the SCS and DN groups in terms of pain and ROM, but clinically we found that abduction range was slightly better in the SCS group.

CONCLUSION

From the above study, we concluded that both SCS and DN can be equally effective in improving pain and ROM (ER and ABD). Both techniques can be considered for reducing trigger point pain in the subscapularis muscle, but DN may be slightly more expensive than SCS and not every person is suitable for it, as someone may have needle phobia. People with bleeding disorders and low immunity levels are usually contraindicated for DN. Therefore, SCS can be a cost-effective technique that is helpful in reducing trigger point pain and improving abduction and external rotation ROM in people with frozen shoulder. Again, we can consider DN to relieve the pain immediately after checking all contraindications.

LIMITATIONS AND FUTURE SCOPE

According to the calculated sample size of 15 in each group, we performed the study only on 9 samples in the DN group and 11 samples in the SCS group because the target population was less available during the study period.

Future research can be conducted with a larger sample to obtain better results.

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ANNEXURES.1

CONSENT FORM

STRAIN COUNTER STRAIN VS DRY NEEDLING ON PAIN AND RANGE OF MOTION IN FROZEN SHOULDER: A RANDOMIZED CLINICAL TRIAL

I have been informed by Mr. Nilesh Panda, pursuing MPT (orthopedic) conducting the above mentioned study under the guidance of Prof. ASIFUZZAMAN SHAHRIYAR AHMED, Associate Professor, ABHINAV BINDRA SPORTS MEDICINE AND RESEARCH INSTITUTE, BHUBANESWAR.

I have no objection and will be a part of that study. I also understand that the study does not have any negative implication on my health. I understand that the information produced by the study will become a part of the institute's record and will be utilized, as per confidentiality regulations of the institute. I am also aware that the data might be used for medical literature and teaching purposes, but all my personal details will be kept confidential.

I am well informed to ask as many question as I can to Mr. Nilesh Panda either during the study or later.

I understand that my assent is voluntary and I reserve the right to withdraw or discontinue the participation from the study at any point of time during the study.

I have explained to Mr._____ The purpose of the research, the procedure required in the language he could understand to the best of my ability.

(Investigator) (Date)

I confirm that Mr. Nilesh Panda (Investigator) has explained to me in the language I can understand, the purpose of the study and the procedure. Therefore, I agree to give my assent for the participation as a subject in this study and I will be accountable for the decision.

(Signature) (Date)

ANNEXURES.2

ABHINAV BINDRA
Sports Medicine & Research Institute
A Unit of the Abhinav Bindra Foundation Trust
Recognised by DMET, Health & FW Dept., Govt. of Odisha, Affiliated to Utkal University
Recognised by Odisha State Council for Occupational Therapy and Physiotherapy

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Reference No. – ABSMARI/IRB/09/2023
Date: 22nd June 2023

INSTITUTIONAL REVIEW BOARD

To
Mr Nilesh Panda,
Post Graduate student, Department of Physiotherapy,
Abhinav Bindra Sports Medicine and Research Institute (ABSMARI).

This is to certify that your proposal for the study titled "**Strain Counter-Strains vs Dry Needling on Pain and Range of Motion in Frozen Shoulder – A Randomized Clinical Trail"** has been taken for discussion in the meeting held on 20th May 2023. Following the meeting, the committee approves the proposal and it has no objection on the study being carried out.

You are advised to familiarize yourself with the ICMR guidelines on biomedical research in human subjects and also adhere to the principles of Good Clinical Practice. You are hereby directed to submit the final report to the committee, on completion of the study. Any case of adverse reactions should be informed to this ethics committee and action will be taken thereafter.

Any such adverse reactions during the course of the study are the sole responsibility of the Principal Investigator and there is no onus on the Ethical Committee members resulting thereof.

We wish you all the best for your study.

Member Secretary

ABHINAV BINDRA SPORTS MEDICINE AND RESEARCH INSTITUTE
ABSMARI
BHUBANESWAR

Chair Person

Utkal Signature, Plot No 273, NH-5, Pahal, Bhubaneswar, 752101
Phone: 6370703650, 6370703651

ANNEXURES.3

ASSESSMENT FORM

Demographic Data:

Name-

Age-

Address-

Phone no-

Gender-

Date of Examination-

- Pre intervention-
- Post intervention-
- Follow up-

Group-

History-

- Any medical condition
- Recent injury around shoulder
- Needle phobia
- Pain history

Examination-

TEST	Pre intervention	Post intervention	Follow up
VAS			
Abduction			
External Rotation			

ANNEXURES.4

MASTER CHART

			Visual Analogue Scale			Range Of Motion					
Group	Age	Gender	Pre	Post 1	Post 2	Pre ABD	Pre ER	Post 1 ABD	Post 1 ER	Post 2 ABD	Post 2 ER
2	61	F	66	31	30	75	20	122	40	125	42
2	53	M	61	30	27	80	25.6	135	51	140	54.2
2	39	F	72	28	15	70	19.2	154	68	160	70
2	64	F	66	18	19	79	28	155	60	150	61
2	58	F	45	12	5	85	24	160	65	166	68
2	58	F	52	21	11	71	22	156	59	159	66.2
2	48	F	60	17	19	69	18	161	72	163	77.2
2	56	F	58	19	8	78	19.9	145	64	150	70
2	57	M	68	24	12	68	20	140	57	144	62
1	52	F	46	20	8	80	29	158	60	166	66
1	49	F	67	22	10	66	17	150	56	154	60
1	55	M	71	32	26	69	17.9	132	49	140	50
1	70	M	55	17	8	79	23	160	52	164	60
1	51	F	67	10	3	82	27.1	169	58	172	70.6
1	52	F	49	11	5	74	26	167	61	173.5	65
1	53	M	78	25	12	50	10.2	148	55	151.6	67
1	49	M	48	16	9	60	16	132	44	140	58.2
1	47	M	69	19	5	55	12	170	48	172	55.4
1	44	F	44	10	11	72	18.5	130	53	139	60
1	56	F	56	9	8	79	22.1	149	73	158	80