



The Effectiveness of Mobilization and Thera band Exercises for Ankle Sprain

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Introduction

Ankle sprains are one of the most common musculoskeletal injuries.¹ It estimate that one ankle sprain occurs per 10,000 person per day. 85% of ankle injuries are sprain and only a small percentage are caused by ankle ligament rupture.²

Ankle sprain are one of the most common orthopedic injuries occurring equally in both sex and age. Ankle sprain results when the ligaments of the ankle have been stretched beyond their limits. Lateral ankle sprain are among the most common injuries incurred while performing both daily living and sports activities. The rate of the recurrence for the lateral ankle sprain has been reported to be high as 70%.³ Ligamentous ankle injuries are the most common sports trauma ,accounting for 10-30% of all injuries.⁴

Mobilization is the concurrent application of a sustained accessory mobilization applied by therapist and an active physiological movement to end range by the patient⁶

The techniques of mobilization are always applied in a pain free direction and are described as correcting joint tracking from a positional fault .It

has been advocated for treatment of joint pain, stiffness and dysfunction.^{7,8}

Mobilization with movement is a manual therapy technique where a manual force is applied to a part of the body and sustained while a previously restricted and/or painful movement is performed. The aim of MWM is to reduce pain, restore normal ROM, by correcting positional fault.⁹

Recognized as the original system of progressive resistance for over 25 years, theraband elastic resistance has been proven to increase strength, mobility, and function as well as reduce joint pain.¹⁰

There is a growing tendency to use elastic tubing or thera band for therapeutic and corrective exercising for musculoskeletal problems.

A large body of literature shows the advantage of early, progressive rehabilitation exercise for all types of musculoskeletal conditions. These benefits include restoration of ROM, decreased pain, neural inhibition, quicker return of muscle function, and improved performance in sports and all daily activities.¹¹

Resistance training using theraband will show declines in pain and improvement in functional ability.¹²

Pain intensity can be measured by Visual Analogue Scale (VAS). A Visual Analogue Scale is a measurement instrument that tries to measure a characteristic or attitude that is believed to range across a continuum of values and cannot easily be directly measured.¹³

The Foot and Ankle Disability Index (FADI) was designed to assess functional limitations related to foot and ankle conditions.¹⁴

Contrast bath involve alternate immersion in hot and cold water producing marked hypermia of the skin. Such treatment will cause considerable sensory stimulations as the cutaneous hot and cold receptors are alternately activated.

The strong sensory stimulation may act to suppress pain and account for subjective relief of pain that occurs in many patients receiving this treatment. Two suitably sized baths ar filled, the hot at 40-45⁰ C and cold at 15-20⁰C.

The need of this study is to find out the effectiveness of mobilization versus theraband exercises in reducing pain and functional improvement in patients with subacute ankle sprain.

There are no comparative studies available in the literature which shows the effect of mobilization and thera band exercise in patients with subacute ankle sprain; hence there exist a purpose and background for genesis of this study.

Objectives of the study

Aims and Objectives

1. To study the use of Normal Mobilization technique for ankle sprain.
2. To study the use of Theraband exercises for ankle sprain.
3. To compare Both techniques 1 & 2 efficacy.

Materials and Methods

Method of Collection of Data

Sampling Technique: Simple Random Sampling

The purpose of this study was explained to all the subjects .An informed consent was taken, followed by demographic data from each subjects

Sample Size: The study included a sample of 40 subjects

Source Of Data: Outpatient Physiotherapy department of Narayana Medical Institutions, Nellore.

Research Design: Comparative study design

Population: Adults suffering from ankle sprain

Selection Criteria

Inclusion Criteria

Both sex

- The age group patients 22 to 35 years
- Subjects having stiff painful Ankle
- Subjects who have limited ROM of Ankle joint (ROM Losses of 25% or greater compared with the uninvolved Ankle in the following Ankle
- Motions; Plantar flexion, Dorsi Flexion, Inversion, Everson.)
- The consent of the subjects physician to participate in the study.

Exclusion Criteria

- Patients below 22 years or above 35 years of the age
- Diabetic patients
- Post traumatic Ankle stiffness
- History of Fractures of ankle complex
- Peripheral Nerve Injury
- Post surgical cases
- Instable ankle Joint
- Malignancies in around Ankle
- Rheumatoid arthritis & osteoporosis

Outcome Measures: Pain

Measurement Tool: Visual Analogue scale for pain

Materials used

- Examination couch
- Therabands
- Goniometer
- Moist heat

- Ice packs
- Pen and papers

Duration of Study: 3 months

Source of Data: Outpatient department of Narayana College of Physiotherapy, Nellore.

Methodology

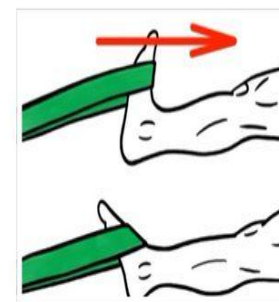
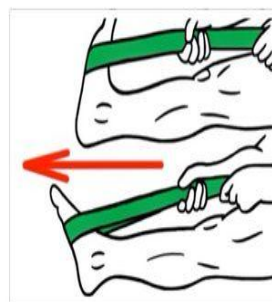
Technique of Application

Procedure

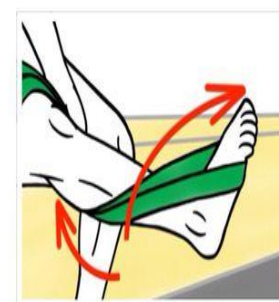
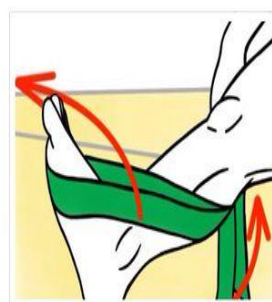
40 subjects will be selected and divided into two groups:

GROUP- A & GROUP- B, according to the inclusion and exclusion criteria.

- **GROUP-A:** 20 Subjects will receive contrast bath and mobilization for 4 weeks.
- **GROUP-B:** 20 Subjects will receive contrast bath and theraband exercise for 4weeks.



Ankle Stability with Thera Band



Thera band Exercises



Mobilization



Mobilization

Data Presentation

The value of Pain (Visual Analogue Scale) before and after the treatment with Mobilization alone and Thera band exercises in Ankle Sprain patients.

Data Presentation:

Treatment with Mobilization		Treatment with Theraband Exercises	
<i>Before</i>	<i>After</i>	<i>Before</i>	<i>After</i>
6	5	7	4
7	5	6	2
8	7	5	3
5	3	8	4
5	5	6	2
7	5	8	5
6	5	8	4
6	4	5	3
7	6	7	3
8	6	8	6

Data Analysis

1. Testing the significance of difference below pain (Visual analogue Scale) in Ankle Sprain patients.

Patients before and after the treatment with Mobilization and Thera band exercises.

- Experimental Group (Thera band Exercises)
- Data analysis was done using paired test.

Table

	Experimental Group	
	Before	After
Mean	6.8	3.6
T Value (calculated)	3.67	
P Value and level of significance.	P>0.01 significant	

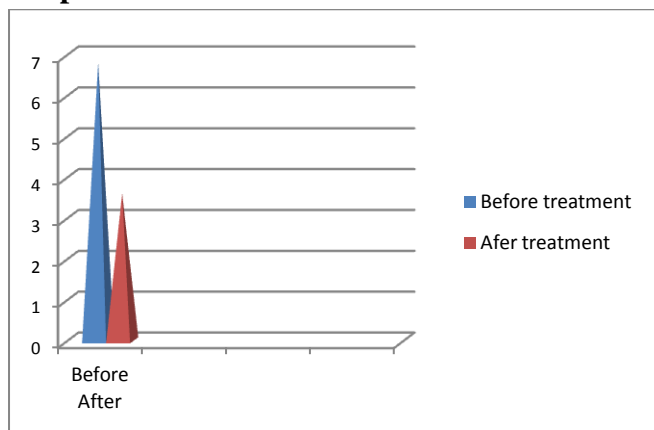
Result

there is a significant difference in the VAS score after Treatment.

Standard Deviation:- 1.166 (before treatment)
1.2 (after treatment)

Experimental Group

Graph:



Mean Pain Scale (VAS)

Result

The calculated value for difference in pain before and after treatment with theraband exercises in experimental group was 3.67 the table value of 1 % level of significant at 9 degrees freedom was 1.83 hence the null hypothesis was rejected and alternate hypothesis was accepted.

Data analysis

Testing the significance of difference between pain[visual analogue scale] in Ankle sprain patients before and after the treatment with mobilization

- control Group (mobilization)
- Before and after treatment with mobilization
- Data analysis was done using paired tests

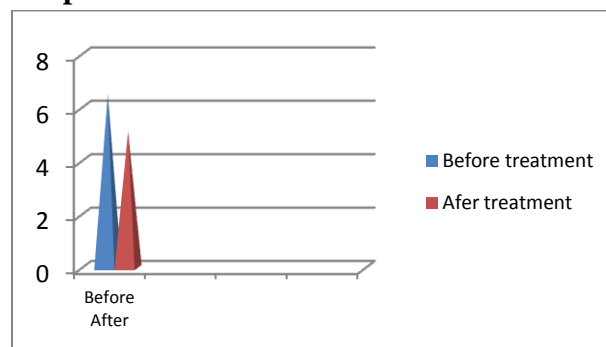
Table

	Control Group	
	Before	After
Mean	6.5	5.1
T Value (calculated)	2.110	
P value and level of significance.	P>0.01 significant	

Standard Deviation:- 1.024(Before treatment)
1.044(After treatment)

Control Group

Graph



Mean pain scale(VAS)

Result

The calculated value for difference in pain assessment scale before and after the treatment with mobilization with act. In control group was 2.11. The table value at 1 % level of significance 9 degrees of freedom was 1.83 hence the null hypothesis was rejected and Alternate hypothesis accepted.

Data Analysis & Results

1. Testing of significance of difference between pain value before and after (VAS) the treatment interventions with mobilizations along with patient education, theraband exercises alone in ankle sprain patients.

- Two groups

Experimental group treated with theraband exercises

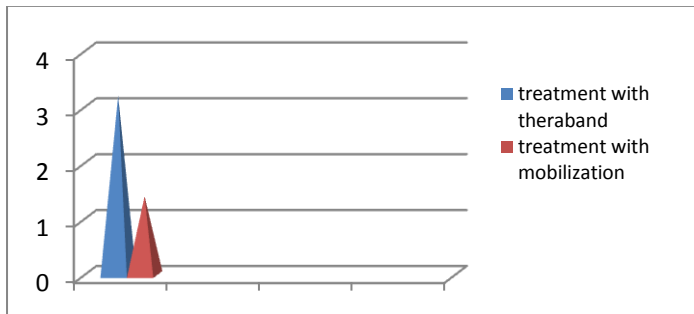
Control group treated with mobilization alone.

Data analysis was done using Unpaired test.

Table

	Experimental group	Control group
Mean	3.2	1.4
T Valu (calculated)	4.93	
P value and level of significance.	P>0.01 significant	

Graph



Mean pain scale(VAS)

Result

The calculated value for difference in pain before and after treatment with thera band exercises in experimental group was 4.93 the table value of 1 % level of significant at 9 degrees of freedom was 1.83 hence the null hypothesis was rejected and alternate hypothesis was accepted.

Discussion

- In this study experimental group of patients treated with thera band exercises along with patient education. There is significant variations in pain score evaluation, on the basis of VAS before and after the treatment. In the experimental group mean value before and after is 6.8 and 3.6 respectively and P value and level of significance is P>0.01 and significant, T value (calculated)=3.67 so this study suggest that pain management by thera band exercises is more beneficial to patients, so this study suggests that thera band exercises- basis for pain reduction.
- In this study control group of patients treated with mobilization alone, there is significant variation in pain score evaluation, on the basis of VAS before and after the treatment. The mean value before and after the treatment is 6.5 and 5.1, T

value (calculated)= 2.110 ,and the P value = P>0.01, significant result. Based on that statistical analysis suggests that pain management by mobilization is useful to the patients.

- Present study results stating that there is significant variations in pain scores evaluating on basis of VAS among two group of patients with ankile sprain by two different treatments namely thera band exercises in one group and by mobilization alone in control group. However both the protocols shows relative progress in pain reduction to a varying extents, the statistical analysis department suggests pain management by thera band exercises to be more effective and fast than those manged by mobilization alone.
- So pain reduction is more by thera band exercises.

Conclusion and Summary

To identify the varying results in pain management by two different regimes in two different groups of ankle sprain patients 20 individuals in each group were selected using simple random sampling technique and were taken as experimental group and control group.

The visual analogue scale reports of two groups were compared after their respective protocols, to expose the facts regarding their effectiveness in fast pain relief.

The study was experimental design. The collected data was analyzed and interpreted using unpaired t test, which showed a significant variation in pain scales of the two groups.

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