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Maitland mobilization is more effective in non-diabetic than diabetic patients a comparative study

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ABSTRACT

To study efficacy of Maitland Mobilization in patients with diabetic and non-diabetic Adhesive Capsulitis, Sample size: 50 patients (25 in each group),Study Design: Interventional Study, Study setting: A 1950 bedded tertiary care teaching hospital with well-equipped medical and surgical intensive care unit and musculoskeletal department, Sample and Sampling method: 50 patients were randomly selected and assigned to 2 groups, as Group 1(control group), Group 2 (Interventional group) in equal numbers. Exclusion Criteria. The total subjects of 50 were included in the study the inclusion & exclusion criteria were Inclusion Criteria: Unilateral adhesive capsulitis defined as loss of active movement of the shoulder joint relative to the affected side, in abduction and external rotation; gender male and female age group, Duration of complaints of 2 weeks to 3 months; Exclusion Criteria were : Previous manipulation under anesthesia of the affected shoulder, other conditions involving the shoulder (eg, rheumatoid arthritis, osteoarthritis, damage of the glenohumeral cartilage, osteoporosis, or malignancies in the shoulder region), Neurologic deficits affecting shoulder function in normal daily activities, pain or disorders of the cervical spine, elbow, wrist, or hand, Injection with corticosteroids in the affected shoulder in the preceding 4 weeks. Subjects with diabetes mellitus were accepted, any h/o of trauma fracture and fall, any orthopedic or neurological limitations. Result: After 4-wk rehabilitation, the shoulder abduction active range of motion in non-diabetes and diabetes patients for involved extremity has increased compared to the pre-rehabilitation period Vas was 4.81, 3.16, 2.46, Abduction was 57.73, 67.93, 80.13 and external rotation was 39.44, 43.50, and 80.21. Conclusion: The rehabilitation program used in this study have shown that the treatments procedure was more significant in non-diabetic as compared to diabetic patients moreover recurrence rate was more in diabetic patients as compared to non-diabetic patients.

Keywords: *Maitland mobilization, Adhesive capsulitis.*

1. INTRODUCTION

Adhesive Capsulitis or adhesive capsulitis or shoulder peri-arthritis affects 2–5% of the population and is most common in the 40–60-year-old age group. Adhesive capsulitis is characterized by an insidious and progressive loss of active and passive mobility in the glenohumeral joint presumably due to capsular contracture. Despite intensive measurement, the etiology and pathology of adhesive capsulitis remain enigmatic. Frequent or sustained shoulder elevation at or above 60o in any plane during occupational tasks has been identified as a risk factor for the development of shoulder traumatic injuries, non-specific shoulder pain and adhesive capsulitis. The pain in the shoulder region often keeps adhesive capsulitis patients Range of Motion performing activities of daily living (ADL) and this is one reason for decreasing the shoulder muscle strength and endurance. Adhesive capsulitis results in a gradual loss of shoulder range of motion and strength of surrounding muscles.The present study was designed to investigate changes in shoulder function in adhesive capsulitis patients after 4-wk individualized rehabilitation combining exercise therapy in mobilization, hot packs and electrical therapy. More specifically, we were interested in examining the shoulder active range of motion, involved extremity before and after the treatment.

Need for study

Diabetes has become one of the most common systemic disorders affecting the world population. It has become essential to put light on conditions especially the musculoskeletal manifestations. This enables the affected patients to identity the risk factors

associated with this. In specific, these patients should be aware of Adhesive Capsulitis in order to prevent further complication and severe disabilities affecting the daily living activities.

2. AIMS AND OBJECTIVES

Study the efficacy of maitland mobilization in patients with diabetic and non-diabetic Adhesive Capsulitis.

OBJECTIVE

- To assess the effect of mobilization on Pain and range of motion in Diabetic Patients.
- To assess the effect of mobilization on Pain and range of motion in non-diabetic patients.
- To compare the effect of mobilization on pain and range of motion in diabetic and non-diabetic patients.

3. MATERIAL AND METHODOLOGY

Research Design of the Study: Interventional
Study Setting: Musculoskeletal Department, RNPC
Sample Size: 30 subjects
Sampling Technique: Simple random sampling
Study Duration: 1 year

Inclusion Criteria:

- Unilateral adhesive capsulitis defined as loss of active movement of the shoulder joint relative to the affected side, in the abduction and external rotation; gender male and female age group
- Duration of complaints of 2 weeks to 3 months;

Exclusion Criteria:

Exclusion criteria were:

- Previous manipulation under anesthesia of the affected shoulder;
- Other conditions involving the shoulder (eg, rheumatoid arthritis, osteoarthritis, damage of the glenohumeral cartilage, osteoporosis, or malignancies in the shoulder region);
- Neurologic deficits affecting shoulder function in normal daily activities;
- pain or disorders of the cervical spine, elbow, wrist, or hand;
- Injection with corticosteroids in the affected shoulder in the preceding 4 weeks. Subjects with diabetes mellitus were accepted.
- Any h/o of trauma fracture and fall.
- Any orthopedic or neurological limitations

Methodology

The institution ethics committee clearance will be obtained. Participants diagnosed as a case of Osteoarthritis Knee will be referred from Orthopaedics.OPD, AVBRH, Wardha. The purpose of the study was explained to the patient and a signed informed consent was obtained from all patients who volunteered for the study. The patients were briefed about the study objective.

Procedure

The shoulder abduction and external active ROM was measured by a universal goniometer. The shoulder internal and external rotation active ROM was measured by Goniometer. Subjects were positioned standing for all ROM tests according to standard guidelines. All assessments were performed by the same physiotherapist. The rehabilitation program consisted for both the group included mobilization Grade I- IV according to condition, Hot packs therapy procedures with the duration of 10-15 min/day and electrical therapy procedures with the duration of 5–10 min/day. The subjects were informed about procedures.

In both groups, every session started with a 5-minute assessment of the ROM by performing all 3 physiologic movements of the glenohumeral joint passively with the subject in the supine position.

Experimental group, mobilization techniques were applied according to Maitland grades III and IV. The duration of prolonged stress on the shoulder capsule in the end-range position varied according to the subject's tolerance ("treating the stiffness"). Subjects were instructed to inform the therapist about the degree and nature of pain during and after treatment. If subjects experienced a dull ache, without increased reflex muscle activity, then the mobilization techniques were continued. Subjects were informed that this ache could last for a few hours after the treatment session. If the pain worsened or continued for more than 4 hours after treatment ("treatment soreness"), then the intensity of the mobilization techniques was decreased in the next session.

In Control Group, the therapist explicitly informed the subjects that all techniques should be performed without causing pain in the shoulder. Mobilization techniques commenced in the basic starting positions with translation and distraction techniques performed with the joint near its neutral position (grade I). Reflex muscle activity was carefully monitored because it can be the

first indication of joint pain. If joint mobility increased, then mobilization techniques were adjusted, and the amplitude of movements was increased without reaching the limits of ROM (grade II).

Electrical Agents [Interferential current therapy (IFC)]

This type of stimulation is characterized by the crossing of two electrical medium, independent frequencies that work together to effectively stimulate large impulse fibers. These frequencies interfere with the transmission of pain messages at the spinal cord level. Because of the frequency, the Interferential wave meets low impedance when crossing the skin to enter the underlying tissue. This deep tissue penetration can be adjusted to stimulate parasympathetic nerve fibers for increased blood flow. Interferential Stimulation differs from TENS because it allows a deeper penetration of the tissue with more comfort (compliance) and increased circulation.

4. HYDROCOLLATEROL PACKS

Hydrocollateral packs are packs which are immersed in an apparatus called hydrocollator. They provide superficial moist heat to the part where applied. They contain a substance which absorbs heat like silica or gel. The temperature for hydro collator pack 65-80. Hot packs are applied over layers of towels for 20-30 minutes. Most of the heat transfer from the hot pack to the patient is by conduction. Increasing the towel thickness reduces the heat flow and produces an intentional slowing in the temperature rise. Acceleration of heat transfer occurs if the hot pack leaks into the towel. The patient never should lie on the hot pack, as the body weight could squeeze hot water out of the pack into the towel and potentially cause a burn.

5. DATA ANALYSIS AND GRAPHICAL REPRESENTATION

Diabetic

Days	Mean value		
	VAS	Abduction	Ext. rotation
7^{th}	4.81	57.73	39.44
14^{th}	3.16.	67.93	43.50
21^{st}	2..18	80.13	80.21

Non-diabetic

Days	Mean value		
	VAS	Abduction	Ext. rotation
7^{th}	5.54	63.16	41.46
14^{th}	2.66	86.66	58.62
21^{st}	1.53	88.17	67.16

6. RESULTS

Before the rehabilitation, patients demonstrated a reduction in the shoulder abduction and external rotation active range of motion for involved extremity. After 4-wk rehabilitation, the shoulder abduction active range of motion in non-diabetes and diabetes patients involved extremity has increased compared to the pre-rehabilitation period. However, in diabetes patients, the shoulder abduction and external rotation active range of motion for involved extremity remained significantly lower compared with non-diabetes patients. In adhesive capsulitis patients, shoulder pain was decreased after the rehabilitation as compared to the pre-rehabilitation period.

7. DISCUSSION

This study examined the effect of rehabilitation on shoulder function in Adhesive Capsulitis patients. A marked shoulder active range of motion deficit was observed in adhesive capsulitis patients before rehabilitation. Shoulder abduction and external rotation active range of motion in diabetes patients involved extremity were less, respectively, as compared tonon-diabetic. Several previous studies demonstrated a reduced shoulder active range of motion in different directions in adhesive capsulitis patients. The pathogenesis of primary adhesive capsulitis is unknown. Adhesive capsulitis, loss of dependent fold, decreased capsular volume and capsular contractions have been demonstrated in adhesive capsulitis patients. Diabetes mellitus is a chronic metabolic condition characterized by persistent hyperglycemia with resultant morbidity and mortality related primarily to its associated micro-vascular and macro-vascular complications. In our study, nondiabetes patients showed substantial improvement in shoulder abduction and external rotation active range of motion for involved extremity after 4-wk rehabilitation as compared to diabetes patients. One important factor for rehabilitation of adhesive capsulitis patients is decreasing the shoulder pain.In the present study, the shoulder pain in both patients was significantly decreased after rehabilitation as compared with the pre-rehabilitation period, However, the present study indicated that after the rehabilitation shoulder abduction and external rotation active range of motion in diabetes patients for involved extremity remained significantly lower compared with involved extremity of non diabetics, improvement of shoulder active Range of Motion in adhesive capsulitis patients after treatment might be caused, partly, by reduced shoulder pain.

8. CONCLUSIONS

The rehabilitation program used in this study has shown that the treatment procedure was more significant in nondiabetic as compared to diabetic patients more over recurrence rate was more in diabetic patients as compared to nondiabetic patients.

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