

Comparative Study Of Range Of Motion After Conventional Physiotherapy In Adhesive Capsulitis Of Shoulder Joint Among Diabetic And Non-Diabetic Patients At Teaching Hospital Batticaloa.

#R Rakunaraj

Teaching Hospital, Batticaloa

#rajslkpt@gmail.com

Abstract: Adhesive capsulitis (AC) of shoulder is one of the commonest condition among musculoskeletal disorders. It affects both male and female gender and some medical conditions associated with AC especially diabetes. Physiotherapy is the most advocated treatment option to manage this condition conservatively. The objectives were to compare the range of motion (ROM) of shoulder joint in percentage among the patients with AC associated with diabetic and nondiabetic patients received follow-up at the Teaching Hospital Batticaloa after conventional physiotherapy and to determine the associated risk factors that delaying the recovery. The methodology was Observational, prospective institutional based study was conducted at the Department of Physiotherapy, Teaching Hospital Batticaloa, Sri Lanka for the period of 12 weeks. 32 patients with primary AC were recruited to this study, 15 with diabetic and 17 without diabetic. An interviewer administered questionnaire was given to the participants prior to the commencement of physiotherapy sessions and goniometry measurement was obtained in mean percentage in AC shoulder and contralateral side before and after the conventional physiotherapy with a standard 12-inch plastic goniometer. Data was analyzed in SPSS. The results shown that the conventional physiotherapy would have an impact in improving ROM of AC shoulder both in DM and non-DM population and this trend was statistically significant at a confidence level of 95% ($p < 0.05$). However,

there was no statistically significant ($p > 0.005$) observation identified when compare the recovery of the ROM among DM and non-DM patients with conventional physiotherapy. There was no impact on the recovery of ROM in AC patients associated with DM when compared to non-DM population. Even though the present study is a preliminary in nature, the results indicated that there is no significant improvement among patients with non-DM with compared to DM patients. Therefore, it may not advisable to do over treatment to DM patients with the intention of gaining a higher productivity in the range of motion.

Keywords: Adhesive capsulitis, Frozen shoulder, Range of Motion, Diabetes, Physiotherapy.

Introduction

Peripheral joint disorders are common among the orthopaedic conditions. Of which Adhesive Capsulitis (AC) of shoulder also known as Frozen Shoulder (FS) is one of the commonest peripheral joint disorder primarily referred to physiotherapy for managing conservatively. The AC involve at the glenohumeral joint resulted by synovial thickening of the joint capsule and contracture of the surrounding soft tissues. Movements of the glenohumeral joint are restricted in all directions and the symptoms of pain and Range of Motion (ROM) of shoulder are getting worse gradually (Yanlei, Keong, & Tijauw Tjoen, 2019). Some studies revealed that about 40 % of patients felt stiffness and pain persistently for more than

3 years and 7 % to 15 % patients experienced permanent loss of function in shoulder joint. Definite cause for idiopathic or primary AC is unknown, though there are some risk factors influencing in to this condition such as diabetic, hyperthyroidism and female gender however, diabetic shows strong closest association with AC (Yanlei *et al.*, 2019). FS is common among diabetic patients with a reported incidence ranges from 10.0% to 36.0% and prevalence ranges between 10.3% to 22.4% (Vastamäki *et al.*, 2016). Another there study revealed that incidence range in diabetic is 28% to 40 % where as 2 % to 5 % in general population (Yanlei *et al.*, 2019). Adhesive capsulitis is one of the common condition among the musculoskeletal system. According the past records from May 2018 to May 2019 period, there are about 8-9% of the incidence among the reported cases to the Physiotherapy Department of Teaching Hospital Batticaloa as outpatients were recorded as adhesive capsulitis. However, some of them require in ward admission in order to undergo other intervention such as Manipulation Under the Anesthesia (MUA) or intra articular injection. AC patients with diabetic complained of poor improvements in Range of Motion (ROM) followed by physiotherapy sessions. Therefore, a focus should be drawn to compare the improvement of ROM in AC patients associated with diabetic and non-diabetic condition in order to assess the improvement and recovery rate. In addition, the present study aims at determining the responsible factors affecting a delay in recovery. The objective of this study was to compare the range of motion (ROM) of shoulder joint in percentage among the patients with adhesive capsulitis associated with diabetes and nondiabetic patients received follow-up at the Teaching Hospital Batticaloa after conventional physiotherapy.

Methodology:

This was a 12 weeks cross sectional prospective institutional based study was conducted at the Department of Physiotherapy, Teaching Hospital Batticaloa, Sri Lanka. 32 patients were recruited for this study. Patients over 18 years with diabetic lasting more than 3 years and patients without having diabetic have been diagnosed to have unilateral primary AC in the period between 3 to 9 months after the onset of the condition were included. And the patients who reject to participate for the study, patients undergoing other alternative medicine parallel with physiotherapy, non-consenting patients and past history of shoulder surgery or with comorbidities of life-threatening disease were excluded. Data was collected through an interviewer administered questionnaire prior to the commencement of physiotherapy session and goniometry measurement was obtained in mean percentage of shoulder ROM (flexion, abduction, external rotation, internal rotation and extension) of AC shoulder and contralateral shoulder before and after the conventional physiotherapy with a standard 12-inch plastic goniometer based as gold standard measurement. Data was analysed in SPSS version 19. Also, the ethical clearance was obtained from the Ethics Review Committee (ERC) of the Faculty of Medicine, University of Kelaniya Sri Lanka.

Results:

Among the 32 studied patient population, the gender ratio remained 1:1 (n=16 for males and females), while majority of respondents (81.3 %) were belonging to the age group of > 55 years old (Table 4.1). Around 96.9 % patients were married. The O/L qualification was the most common education level (34.4 %) among the patients, while majority were unemployed (53.1 %), with a monthly income of < 10000 LKR (56.2 %). Interestingly, majority of the patients (65.6 %) were not familiar with the issues in ROM.

The percentage of diabetic, hyperlipidemia and hypertension positive patients were 46.9%, 50 % and 34.4 % among the entire patient population as indicated in Table 4.1.

Table 1: Socio-demographic characteristics of the studied patient population

Variable	Category	Number	Percentage (%)
Gender	Male	16	50.0
	Female	16	50.0
Age (Years)	<25	0	0.0
	26-35	0	0.0
	36-45	6	18.8
	46-55	6	18.8
	>55	26	81.3
Marital status	Married	31	96.9
	Unmarried	1	3.1
Educational Level	No school	2	6.3
	Grade 1-4	5	15.6
	Grade 5	6	18.8
	O/L	11	34.4
	A/L	6	18.8
	Higher education	2	6.3
Employment	Unemployed	17	53.2
	Employed	3	9.4
	Retired	12	37.5
Income amount per month (LKR)	<10000	18	56.3
	10000-15000	2	6.3
	16000-20000	1	3.1
	21000-25000	4	12.5
	26000-30000	4	12.5
	31000-35000	2	6.3
	>35000	1	3.1

Diabetic status	Diabetes	15	46.9
	Non-Diabetes	17	53.1
Hyperlipidemia	Positive	16	50.0
	Negative	16	50.0
Hypertension	Positive	11	34.4
	Negative	21	65.6
Have you heard about the condition	Yes	11	34.4
	No	21	65.6

Effect of physiotherapy on the recovery in both DM and non-DM were described the mean extension percentage for Abduction, External Rotation (ER) and Internal Rotation (IR) of ROM in the studied population remained as 60.1±2.8 %, 53.2±2.8 % and 62.2±2.9 %, respectively, before the physiotherapy sessions. The percentage of all parameters corresponding to both active and passive ROM increased after the treatment with respect to both active and passive ranges (Figure 4.1). The results of the paired t test suggested that this trend was statistically significant at a confidence level of 95% (p<0.05).

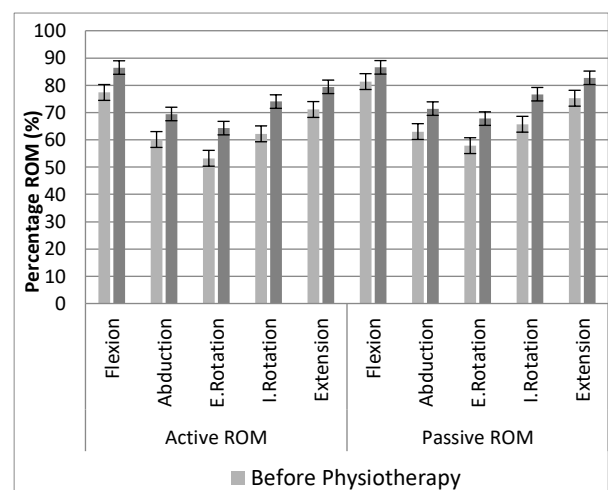


Figure 1: The ROM features before and after physiotherapy

Effect of diabetic status on the percentage recovery (comparison) revealed both

diabetic and non-diabetic populations denoted positive recovery rates. The recovery percentages of non-diabetic patients were relatively higher, except for abduction, ER (active ROM), flexion (passive ROM) and IR (passive ROM) as indicated in Figure 4.7. According to the statistics of the independent sample t test, the effect of diabetic status on the recovery levels of ROM remained statistically insignificant ($p>0.005$).

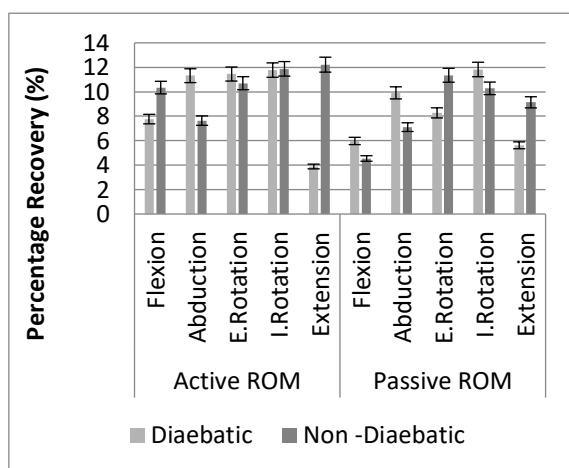


Figure 2: The variation of percentage recovery of studied ROM features with the diabetic status

The results of the present study shown, that the conventional physiotherapy would have an impact in improving ROM of AC shoulder both in DM and non-DM population and this trend was statistically significant at a confidence level of 95% ($p<0.05$). But there was statistically insignificant ($p>0.005$) when compare the recovery of ROM among DM and non-DM patients with conventional physiotherapy. Though recovery percentage of non-diabetic patients were relatively higher, except for abduction, ER (active ROM), flexion (passive ROM) and IR (passive ROM).

Conclusion

This present study stands as the first documented research work as there was no published study available in Sri Lanka on comparison of ROM of shoulder in AC

patients associated with DM and non-DM. This present study revealed that there was no impact on the recovery of range of motion in AC patients associated with diabetes when compared to non-DM population. However, it emphasizes that conventional physiotherapy is an effective treatment option for AC patients. The limitations of this study were duration of this study was not sufficient to follow-up more treatment sessions, low number of sample size did not represent a sufficient number of patients with diabetes and this study was limited to one institute. Therefore, it is recommended to expand the study with more sample size including different institutes.

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