

Level of disability among individuals with Adhesive Capsulitis visiting Dhulikhel Hospital using Quick-DASH

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Abstract- Adhesive capsulitis affects shoulder joint with pain and mobility deficits. It has been termed as a self-limiting condition but recent evidences have shown patients facing long term disability for years due to this condition. Pain and stiffness are the factors defining disability with early pain or late stiffness in this condition. The level of disability is a component defining clinical state of adhesive capsulitis by which interventions can be planned out. **Method:** This is a cross-sectional study of 30 individuals with Adhesive Capsulitis visiting Dhulikhel Hospital in Nepal. Socio demographic factors, pain intensity and level of disability were recorded. Numeric Pain Rating Scale (NPRS) and Quick-Disability of arm shoulder and hand (Q-DASH) were the two outcome tools used to measure pain intensity and disability levels. Descriptive analysis was used for the sociodemographic findings and Chi-square test was used to observe the association between Pain and Disability. **Results:** The study found that majority of individuals had moderate level of disability (70%) followed by mild (23.3%) and severe level (6.7%). There was an association between pain and disability ($p < 0.05$). **Conclusion:** Maximum number of individuals had moderate level of disability affecting their functional task due to pain and stiffness.

Index Terms- Adhesive capsulitis, Disability, Shoulder joint, Pain, Stiffness

I. INTRODUCTION

Shoulder is the third most-frequently painful region after the back and neck [1]. In general population, 2-5% have Adhesive Capsulitis and the incidence is 4.3-38% in individuals with diabetes and thyroid disease. Adhesive capsulitis (AC) is common between 40-65 years age where females are mostly affected. The occurrence of this condition is 5-34% in the contralateral side after the involvement of one side. The causes can be primary or secondary cause, former being the idiopathic with no systemic condition or history of injury and later one has 3 subcategories-systemic, extrinsic & intrinsic.² This condition affects shoulder joint with pain and mobility deficits [2,8,14].

Adhesive capsulitis and Disability

Disability is defined by WHO as "Any restriction or lack of ability to perform an activity in a manner or within a range considered normal for human being"[3]. Adhesive capsulitis has been termed as a self-limiting condition but recent evidence has

shown to have long term disability in patients for many years[4]. There is inflammation of the joint capsule and synovium which results for capsular contracture thereby holding the humeral head tightly in glenoid labrum and limiting the glenohumeral joint Range of Motion (ROM). There is the growth of new vessels and nerve and this new nerve produces increased pain response to the joint and ultimately affects the mobility and functional ability[12,13]. ROM impairment in this condition has affected individuals' ability to participate in self-care and occupational activities[3].

Pain and Disability:

The intensity of pain and level of disability are to define clinical state in Adhesive capsulitis. In many chronic cases, there is a direct relation of pain intensity and disability but in the condition of adhesive capsulitis, initially there is pain and then stiffness begins to develop. After certain time, pain starts to resolve but the stiffness persists resulting in disability. [2].

Quick-DASH:

Quick-Disability of Arm, Shoulder and Hand (Quick-DASH) a self-reported questionnaire is a shortened version of DASH with 11 items to measure physical function and symptoms in people with upper limb musculoskeletal disorder. In Quick DASH, mental function, sensory function and pain, neuromuscular movement, mobility, self-care, domestic life, interpersonal interaction are some parameters that define disability level[11]. The final interpretation is ranged from 0 to 100 where 100 defines higher rate of disability and 0 as no disability [3,15].

Statement of the Problem:

Individuals with adhesive capsulitis is one of the common shoulder problems seen in out patient department. Patient reported pain intensity and level of disability are the factors for determining clinical state and intervention of the condition. Pain is commonly assessed but assessment of disability level is often missed.

Need of the study:

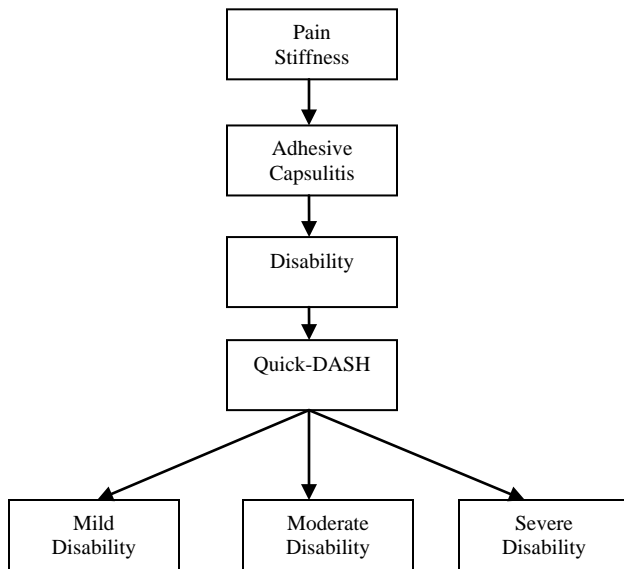
There is difficulty in performing activities of daily living due to pain and mobility deficit in the patient suffering from this condition. Cause of disability initially is due to the pain which is followed by stiffness in later stages of the condition. Patient self-reported disability level is a factor describing clinical state of the

condition which affects the intervention plan. Therefore, there is a need to determine the level of disability in patients having adhesive capsulitis and such a study has never been conducted in out patient settings in Nepal

Research Question

What is the level of disability among individuals with Adhesive capsulitis visiting Dhulikhel Hospital?

Conceptual Framework:



OBJECTIVES

General Objective:

- To determine the level of disability among individuals with Adhesive Capsulitis visiting Dhulikhel Hospital.

Specific Objective:

- To find the association between pain and disability level.

RESEARCH HYPOTHESIS

Alternate Hypothesis

- There is association between pain and disability level.

Null Hypothesis

- There is no association between pain and disability level.

LITERATURE REVIEW

Shoulder is the third painful region after back and neck. In a study conducted by Trevor et al 2013, the prevalence of shoulder pain in adult accounted for 6.9% to 26%. Within this population 18.6% to 31% individuals had disability in the first month whereas 4.7 to 46% have disability for 1 year [1,6].

Adhesive Capsulitis is characterized by disabling pain and restriction in the range of motion of the shoulder joint. Pain is

usually gradual, progressive and sleep disturbing type. This painful phase is followed by stiffness. Kelley et al, in 2013 explained the phases of the condition as stage I lasting for 3 months having sharp pain and sleep disturbances with minimal to no ROM restriction. Stage II lasts for 3- 9 months with pain and gradual loss of motion in all directions. With stage III, the pain and inflammation decreases but capsular fibrosis begins to develop decreasing the ROM which lasts for 9 to 16 months. In stage IV, pain resolves but significant stiffness develops for 17 to 24 months [2].

There is a proposed guideline for diagnosis, examination and treatment of shoulder pain and restricted range which states patient reported pain intensity and level of disability as the factors for determining clinical state and intervention in Adhesive capsulitis. In the study conducted by Trevor et al 2009, pain intensity has been shown strong association with functional disability. In adhesive capsulitis, pain and stiffness phases appear at different time which affect level of disability unlike to any other cases where pain and disability are directly linked. In a study by Fernandes et al 2014, minimal level of disability persists in individuals even after 24 month. The previous studies said that the condition is self-limiting within 24 months. However, 15% of the individuals experience long term disability as a result of chronic loss of shoulder mobility [1,2,4,6].

In a study with stage II of adhesive capsulitis by Griggs et al 2000, after 22 months, 40% of the individuals reported residual shoulder disability with SD score of 9.7 to 13.6 in DASH score[12]. There has been study finding that even after 44 months of the condition, individuals had mobility deficit with little functional deficit. This was also supported by the study done by Shaffer et al that even after 7 years of follow up, 89% of the individuals had functional limitations and deficits[2,19,20].

In 2014, study done by Fernandes et al. stated that Adhesive capsulitis has worst impact in the physical domain of Quality of Life. The psychological factors like fear of pain, pain catastrophisation contribute to the musculoskeletal pain and disability[18].

DASH is an outcome tool used in Adhesive Capsulitis having a good psychometric properties in shoulder pathologies[11].

METHODOLOGY

Study design: A Quantitative Cross Sectional study

Study Site: The study was conducted at Physiotherapy Outpatient Department of Dhulikhel Hospital, Nepal

Population and sample:

Study population: Individuals diagnosed as Adhesive Capsulitis

Selection Criteria:

Inclusion Criteria:

- Age 40 years or above
- Complain of shoulder pain

- Physical examination: Loss of full shoulder abduction and external rotation range

Exclusion Criteria:

- Passive ROM is normal
- Glenohumeral external rotation ROM increases as the humerus is abducted from 45° toward 90°
- 6 months of history of recent trauma on affected shoulder

Sampling technique: A non-probability purposive sampling method

Sample Size: 30 Adhesive capsulitis individuals

Measurement

The Study measurement was divided into two variables: dependent and independent variables. The following study attributes were measured in the study.

Independent Variable:

- Pain
- Stiffness

Dependent Variable:

- Disability

Data Collection and Ethical considerations :

- An official permission was taken from Institutional Review Committee - Kathmandu University School of Medical Sciences and the Department of Physiotherapy, Dhulikhel Hospital.
- Verbal and written consent was obtained from the participants prior to the data collection. The purpose of the study was explained to all the participants.
- The participants could withdraw from the study at any time without giving any reason on their own choice. The participants were reassured that confidentiality would be maintained throughout the study.
- Data was collected using self-administered questionnaires.

Data Collection Tools:

Quick- DASH: Quick-Disability of Arm Shoulder and Hand (Quick-DASH) is a shortened version of DASH. The patient reports their level of difficulty in 11 questions where the difficulty rating for each question is from 1 to 5. The obtained result is always between 0 to 100 where 100 is higher rate of disability and 0 is no disability. The level of disability is classified as mild level (<33), moderate level (33 to 66) and severe level (>66). It has good psychometric properties with reliability 0.94, validity 0.70 and responsiveness 0.79. Translated Nepali Version was used for the study.

Numeric pain rating scale:

Participants rated the intensity of their pain on a Numerical Pain Rating Scale (NPRS). In the present study, an 11 -point NPRS was used with 0 labeled as “no Pain” and 10 as “extreme pain.” Participants were prompted to rate the intensity of the pain. All of the NPRS ratings will be then averaged for each participant to give a global pain-intensity score. The psychometric properties of Nepali- version is good.

DATA ANALYSIS

Data processing

Editing

After the collection of data, it was rechecked to see whether all the contents were present. It was seen that none of the components were skipped or missed. The obtained information was only accessible to the researchers.

Categorization and Tabulation

All the collected data were analyzed and categorized on the basis of research objectives. Data was arranged, entered and tabulated in SPSS-16.0

Data Analysis and Summarization

Descriptive statistics and inferential statistics (Chi-Square Test) were used. After the data analysis, the findings were summarized in consultation with the statistician.

Data analysis and Interpretation of Data

After careful analysis of the collected data and upon completion of summarizing and drawing conclusions, exploration of their significance was done. Attempts were made to search for their meaning in relation to the purpose of the study. The ultimate aim was in developing and implementing the empirical phase of the study and to determine its possibility of generalization, recommendation and application.

Data Presentation

Prevalence of disability was found out in frequency and percentage. Chi- Square test was used to assess the association of pain and disability.

RESULTS

Total 30 individuals who met the criteria set were taken in the study. The detailed results with description are shown in the table below.

Table 1: Demographic Information

Variable	Frequency	Percentage (%)
Gender		
Male	15	50
Female	15	50
Total	30	100
Dominance		
Right	29	96.7
Left	1	3.3
Total	30	100
Affected shoulder		
Right	13	43.3
Left	17	56.7
Total	30	100

Table 2: Number of Patients during different stage of AC

Duration of AC	Number of Patients	Overall Percentage
0-3 month	15	50
3-9 month	9	30
9-16 month	5	16.7
16-24 month	1	3.3
Total	30	100

Table 1 shows that equal number of male and female individuals visited in physiotherapy OPD with AC. Out of which 96.7% individuals were with right hand dominance and 3.3% with left hand dominance 56.7% of individuals came with problem in their non dominant left shoulder.

Table 2 shows 50% of the individuals visited during 0-3 month duration followed by 30% in 3-9 month, 16.7% in 9-16 month and 3.3% in 16-24 month. There were no individuals visiting after 24 months.

Table 3: Prevalence of Level of Disability

Disability	Frequency	Percentage
Mild	7	23.3
Moderate	21	70.0
Severe	2	6.7
Total	30	100.0

Table 3 shows the majority of individuals had moderate level of disability(70%) followed by mild level (23.3%) and severe level (6.7%).

Table 4: Association of Pain and Disability

	NPRS total	QD int
Chi-Square	11.600 ^a	19.400 ^b
Df	12	2
Asymp. Sig.	.478	.000061

Table 4 shows the p value is 0.000061 which is less than 0.05. Therefore, there is association between pain and disability

DISCUSSION

Pain and disability are commonly encountered and interrelated with shoulder pathologies. Pain in early phase of adhesive capsulitis is followed by stiffness. The increase in pain intensity causes decrease in range of motion resulting for disability. The relation of pain, stiffness and disability are explained with different phases[1,2].

In our study, many individuals (50%) visited in their early stage with increase in pain intensity accounting for disability. Therefore pain induced disability was found to be more. The remaining individuals were from stage II to IV. In these stages, there is reduction in ROM which results for their disability. Thus,

pain and restricted ROM are two variables for defining the level of disability in Adhesive Capsulitis.

The final result of the study showed that majority of individuals had moderate level of disability. This could be because of active movement of shoulder in functional activity and occupation despite pain or stiffness. Majority of individuals in the study visited with the complain of pain at Stage I and therefore the dominant effect of pain on disability was found which is similar to the previous studies showing strong association between pain and disability.

In this study, 56.7% individuals had problem in their non-dominant hand so their functional capacity was not much affected as they could perform the task with dominant hand without greater level of difficulty. This could also be a plausible reason for more number of individual with only moderate disability level otherwise.

Various studies state that disability is related with pain, age, duration and psychological variables[18]. In our study, pain was reported on all the individuals, the mean age is 57 years and the duration of symptom is more in first 3 months accounting for disability related to pain. But the psychological variables that can affect the disability level was not assessed which tends to be limitation of the study.

Further Recommendations:

- The increase in number of adhesive capsulitis individuals with reported stiffness also can be taken for being more specific to stiffness induced disability with larger sample size.
- Assessment of Psychological factor of pain can be done.

Conclusion

Maximum number of individuals were found with moderate level of disability affecting their functional task, with reporting of pain in the early stage of condition and therefore the pain and level of disability was found to be associated.

Clinical Implication

Based on the result, there is a need to focus in the management of pain for reducing the disability level because pain limits the range of motion and functional activities in an individual visiting with acute onset of pain. Other interventions include education, pain modulation, gentle stretching, and shoulder mobilization².

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REFERENCES

- [1] Sakulsriprasert P, Kuwiboonsilp W, Pichaiyongwongdee S, Adisaiphaopan R, Mingsoongnern S. Responsiveness of pain, shoulder external rotation range of motion, and disability in individuals with shoulder adhesive capsulitis. J Med Tech PhyTher 2015;27:1

- [2] Kelley MJ, Shaffer MA, Kuhn JE, Michener LA, Seitz AL, Uhl TL, et al. Shoulder Pain and Mobility Deficits: Adhesive Capsulitis. *Journal of Orthopaedic & Sports Physical Therapy*. 2013;43(5):A1-31.
- [3] World Health Organization. Report on disability. 2010
- [4] Fernandes Mr. Correlation Between Functional Disability And Quality Of Life In Patients With Adhesive Capsulitis. *ActaOrtop Bras*. 2015;23(2):81-4.
- [5] Hsu JE, A O, Anakwenze, Warrenderb WJ, Abboud JA. Current review of adhesive capsulitis. *J Shoulder Elbow Surg*. 2011;20:502-15.
- [6] Trevor A. Lentz, Josh A Barabas, Tim Day. The relationship of Pain Intensity, Physical impairment, and Pain-related fear to function in patients with shoulder pathology. *Journal of Orthopaedic & Sports Physical Therapy* 2009;39(4):270-274 J, JJ G, JG Z.
- [7] Johnson AJ, Godges JJ, Zimmerman GJ, Ounanian LL. The effect of anterior versus posterior glide joint mobilization on external rotation range of motion in patients with Shoulder Adhesive Capsulitis. *J Orthop Sports PhysTher*. 2007;37:88-99.
- [8] AI B, DY B, BL H, S R. Frozen shoulder: A long term prospective study. *Ann Rheum Dis*. 1984;43:361-4.
- [9] MJ K, PW M, BG L. Frozen shoulder: evidence and a proposed model guiding rehabilitation. *J Orthop Sports PhysTher*. 2009;39:135-48.
- [10] PS A, KVK M. A profile study of patients with periarthritis shoulder. *JMSCR*. 2014;2(6):1406-15.
- [11] Y R, LH S, BE H. A systematic review of measures of shoulder pain and functioning using the International classification of functioning, disability and health (ICF). *BMC Musculoskeletal Disorders* 2013;14:73.
- [12] AM W. Arthroscopic appearance of frozen shoulder. *Arthroscopy* 1991;7:138-43.
- [13] Aydeniz A GS, Guney E. Which musculoskeletal complications are most frequently seen in type 2 diabetes mellitus? *J Int Med Res*. 2008;22:503-12.
- [14] Griggs SM AA, Green A. Idiopathic adhesive capsulitis. A prospective functional outcome study of nonoperative treatment. *J Bone Joint Surg Am*. 2000;82-A:1398-408.
- [15] Hand GC AN, Matthews. The pathology of frozen shoulder. *J Bone Joint Surg Br*. 2007;89:928-32.
- [16] JF. B. Periarthritis of the shoulder and diabetes mellitus. *Ann Rheum Dis*. 1972;31:69-71.
- [17] Urwin M SD, Allison T. Estimating the burden of musculoskeletal disorders in the community: the comparative prevalence of symptoms at different anatomical sites, and the relation to social deprivation. *Ann Rheum Dis*. 1998;57:649-55.
- [18] Institute of Work and Health. 2006
- [19] Schaffer B, Tibone JE, Kerlan RK. Frozen shoulder: a long-term follow-up. *J Bone Joint Surg Am*. 1992;74:738-56
- [20] Binder AI, Bulgen DY, Hazleman BL, Roberts S. Frozen shoulder: a long-term prospective study. *Ann Rheum Dis*. 1984;43:361-4. doi: 10.1136/ard.43.3.361.

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