# ASSESSMENT OF QUALITY OF LIFE IN ADHESIVE CAPSULITIS (AC) AMONG TYPE 2 DIABETES MELLITUS PATIENTS ATTENDING OUT PATIENT DEPARTMENT AT ARIGNAR ANNA GOVT HOSPITAL OF INDIAN MEDICINE - A CROSS SECTIONAL STUDY

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**ABSTRACT**

**INTRODUCTION:** Diabetes mellitus (DM) is a metabolic disorder leads to musculoskeletal complications such as Adhesive capsulitis (AC). AC characterised by insidious painful later progressively restricted glenohumeral joint ROM (external/internal rotation > abduction). It affects the patient's routine, often deprived Quality of life (QOL). 71.5% of the DM patients associate with AC. Clinically, diagnosis made by history and examination owing to usually the x ray was not abnormal.

**AIM AND OBJECTIVE:** Assessment of QOL in ADHESIVE CAPSULITIS among TYPE 2 DM, attending PG MEDICINE OPD, at AAGHIM Chennai.

**MATERIALS AND METHODOLOGY:** An observational study was done with 100 samples, to access QOL, PENN SHOULDER SCALE (PSS Scale) questionnaire was utilised to collect data and analysed by SPSS software.

**RESULTS:** In PSS, total score out of 100, 14% patients in range (1 - 30) means severely deprived QOL 66 % patients had (31 – 60) means moderately affected QOL, 20 % of patients had (61 – 100) means good QOL. Study showed association between the level of HBA1C & PSS total score p value ($<0.05$).

**CONCLUSION** Patients with poor glycemic index suffered a lot, deprived QOL which emphasis early intervention by Siddha either pharmacological, Varmam, thokkanam, etc., mitigate symptoms which would effectively enhance the QOL in AC.

**KEY WORDS** diabetes mellitus (DM), Adhesive capsulitis (AC), Quality of life (QOL), Penn shoulder scale (PSS SCALE), Range of motion (ROM), Aringnar anna govt hospital of indian medicine (AAGHIM).

*Section A-Research paper*

## INTRODUCTION:

Siddha system of medicine is a evidence based traditional medicine in Indian system of medicine, has contribute a main role to treat covid-19 in first and second wave of covid-19[1].In siddha system, adhesive capsulitis have been represents as *kumbavatham*[2].Adhesive capsulitis is otherwise known as frozen shoulder characterized by shoulder joint pain with motion or pain during sleep followed by stiffness and dramatically reduced range of motion. It has three stages, a painful "freezing" stage where pain precedes reduced range of motion lasting 3–9months. The next stage, lasting 4–12 months, is the "frozen" stiff stage where pain is reduced but range of motion remains impaired. The final stage, lasting 12–24 months, is the "thawing" stage where range of motion is gradually improves[3]. The patho-physiology of AC was inflammation, fibrosis & thickening of the shoulder capsule due to repeated activity of affected shoulder joint. X-ray of shoulder joint, arthrogram are the tool to confirm diagnosis of AC. Treatment of AC is conservation and surgical corrections in later stages[4].Complication of AC is residual shoulder pain and/or stiffness, humeral fracture, rupture of the biceps and subscapularis tendons, labral tears, glenohumeral joint dislocation, rotator cuff tear, it being differenced diagnosed as, cervical radiculopathy, fracture, calcifying tendinitis/synovitis, malignancy, rotator cuff impingement, polymyalgia rheumatic, shoulder impingement syndrome[5]. The Upper Limb Committee of the International Society of Arthroscopy, Knee Surgery and Orthopedic Sports Medicine (ISAKOS) classify AC as primary (idiopathic) or secondary (shoulder trauma [fracture, dislocation, and soft tissue injury],primary caused by shoulder include diabetes, Dupuytren contracture, thyroid disease, myocardial infarction, and Parkinson's disease & non-traumatic osteoarthritis, secondary by rotator cuff injury, calcific tendinitis, prolonged immobilization of the shoulder joint after surgery, injury to the cervical spine[6].In literatures deals the prevalence range of AC with, Race [7],age[3], gender[8],occupation[9],Diabetes mellitus[DM][10]etc. Aljethaily et al, has revealed the relation between DM and adhesive capsulitis[11]. The study aims to estimate the quality of life in Diabetic mellitus Type 2 with adhesive capsulitis (AC) patients and it will be able to determine the impact of lifestyle intervention and quality of life in individuals with AC by PENN SHOULDER SCALE[12]

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## METERIALS & METHOD:

**STUDY DESIGN**  : Cross sectional study (Hospital based)
**STUDY TOOL**   **:** Questionnaire method (PENN SHOULDER SCALE)
**STUDY CENTER**  **:** Aringnar Anna Govt. Hospital of Indian Medicine, Chennai 106.
**SAMPLE SIZE**   : 100 patients
**STUDY PERIOD**  : 3 months
Study was initiated after obtained the permission from I.E.C.

•IEC NO: GSMC-CH-1628/ME-2/031/2021. CTRI/2021/21/038368.

## INCLUSION CRITERIA[3]:

•   All gender, Age above 40 – 60 years

•   Known case of Type 2 Diabetes mellitus

•   Known case of Hypothyroidism

## EXCLUSION CRITERIA[3]:

•   Cervical Spondylitis

•   Cholelithiasis

•   History of MI

•   History of Trapezitis

•   Known case of stroke

•   Cerebrovascular accident

•   Humerus fracture

•   Shoulder dislocation

## METHODOLOGY

• The terms and objectives of this study was explained in their language to the patients those who were enrolled in this study for understanding, then got the written consent form

• This was a questionnaire based descriptive study in patients who were diagnosed with AC attending Out Patient in AAGHIM.

• The standard questionnaire, PENN SHOULDER SCORE was issued and the data would be collected, The Penn Shoulder Score (PSS) is a 100-point scale that consists of 3 subscales, including *pain, satisfaction, and function*. The ***pain*** subscale consists of 3 pain category that addressed pain with a 30-point numeric rating scale. Patient ***satisfaction*** with shoulder function is also assessed with a 10-point numeric rating scale. The ***function*** subsection is based on a sum

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of 20 questions, each with a 4-point Likert scale. The total PSS maximum score of **60 -100** indicated high function, low pain, and high satisfaction with the function of the shoulder.The questionnaire is filled in paper and pen method. [13]

• Blood sugar investigations (fasting &postprandial) was done for some of the participants in the study at AAGHIM laboratory. The reports of all the participants were recorded in the study. The response was entered into an excel workbook and were analyzed statistically for co-relation of influencing parameters. Data were entered and analyzed using SPSS statistics in Siddha Central Research Institute, Chennai. The results were summarized as percentage and proportions.

**RESULT**

The cross section study was initiated after obtained the permission from I.E.C.IEC NO: GSMC-CH-1628/ME-2/031/2021,registered in CTRI Reg No: CTRI/2021/21/038368,after the study period the result particularly age,gender,occupation, educational qualification has been showed table 1,the people's HBA1C level showed table 2,The Penn Shoulder Score (PSS) has been showed table 3,relationship between The Penn Shoulder Score (PSS) and HBA1C has been showed table 4

**TABLE 1**

|  | Frequency | Percent |
|---|---|---|
| **GENDER** |  |  |
| **FEMALE** | 71 | 71.0% |
| **MALE** | 29 | 29.0% |
| **SOCIO ECONOMIC STATUS MODIFIED KUPPUSAMY SCALE 2020** |  |  |
| **UPPER MIDDLE** | 11 | 11% |
| **LOWER MIDDLE** | 16 | 16% |
| **UPPER LOWER** | 59 | 59% |
| **LOWER** | 14 | 14% |
| **MARITAL_STATUS** |  |  |
| **MARRIED** | 100 | 100.0% |
| **AGE GROUP** |  |  |
| **40-50** | 44 | 44.0% |
| **51-60** | 56 | 56.0% |

MODIFIED KUPPUSAMY SCALE 2020



■ UPPER MIDDLE  ■ LOWER MIDDLE  ■ UPPER LOWER  ■ LOWER

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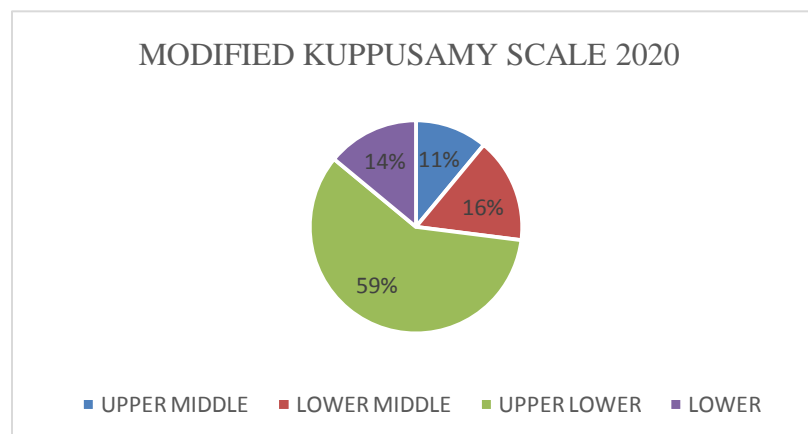
**TABLE 2**

| HbA1c GROUP | Frequency | Percent |
|---|---|---|
| NORMAL | 4 | 4.0% |
| PRE-DIABETIC | 21 | 21.0% |
| DIABETIC | 75 | 75.0% |
| Total | 100 | 100.0% |

**TABLE 3a**

| PENN SHOULDER SCALE | FREQUENCY | PERCENT |
|---|---|---|
| PAIN SCALE GROUP | | |
| 1-10 | 18 | 18% |
| 11-20 | 60 | 60% |
| 21-30 | 22 | 22% |
| SATISFACTION_SUBSCALE GROUP | | |
| 1-4 | 54 | 54% |
| 5-8 | 32 | 32% |
| 9-10 | 14 | 14% |
| FUNCTIONAL_SUBSCALE GROUP | | |
| 1-20 | 37 | 37% |
| 21-40 | 41 | 41% |
| 41-60 | 22 | 22% |
| TOTAL_SCORE GROUP | | |
| 1-30 | 14 | 14% |
| 31-60 | 66 | 66% |
| 61-100 | 20 | 20% |

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**TABLE 3b**

| S.NO | PSS SCORE | PERCENTAGE | INFERENCE |
|------|-----------|------------|-----------|
| 1 | 1- 30 | 14% | DEPENDENT, SEVERELY DEPRIVED QOL |
| 2 | 31- 60 | 66% | DEPENDENT, DEPRIVED QOL |
| 3 | 61- 100 | 20% | GOOD QOL |

**TABLE 4**

| | | PSS TOTAL_SCORE GROUP | | | P VALUE |
|---|---|---|---|---|---|
| | | 1-30 | 31-60 | 61-100 | |
| HbA1c GROUP | NORMAL | 0 | 3 | 1 | |
| | PRE-DIABETIC | 1 | 12 | 8 | 0.019 |
| | DIABETIC | 13 | 51 | 11 | |

**DISCUSSION**

Earlier scientific community was thought, that the siddha system of medicine treats only non-communicable diseases now this perspective has been changed when the treatment was successful in certain viral infections (swine flu), dengue and covid 19 patients has been treated by siddha system in *tamilnadu*. The symptoms of frozen shoulder, often known as Adhesive capsulitis, include painful active and passive glenohumeral (GH) joint range of motion that later becomes gradually reduced, with spontaneous full or nearly full recovery occurring over a variable length of time.[17]. Frozen shoulder,a musculoskeletal disease widely seen in patients suffering with type 2 diabetes mellitus due to poor glycemic control.*Adhesive capsulitis was defined as history of unilateral and/or bilateral pain in the deltoid area with no history of trauma and equal restriction of active and passive glenohumeral movement in a capsular pattern (external rotation > abduction > internal rotation),*[18]. *Piyush mittal ed*, al in 2022, stated AC prevalence of AC commonly seen above 40 years in both gender [10].*Meena ed*, al in 2021 and *Rajeshwary* ed al in 2023 treated AC as *kumbavadham,* mentioned in a siddha literature *yugimunivaithiyasindhamani 800* by external therapy *ottradam and thokkanam*.[2]. Author has done a hospital based cross sectional study to measure the impaired quality of life in AC patient suffer with type 2 DM at AAGHIM in 2021. The study was started after getting IEC permission

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and CTRI registration. This observational study exercised with PSS scale (maximum score 100), has 3 subscales respectively pain subscale (maximum score 30), satisfaction scale (maximum 10 score) and functional scale (maximum score 60)[13]. More than 350 patients were screened in OPD, among that as per IEC recommended inclusion criteria only 100 sample enrolled in to the study. Data were collected in case reporting form, PSS scale and analyzed in SPSS software by SCRI statistician. In this study among 100 samples, 71% were female and 29% were male and 44% were comes under 41-50 age group, rest of 56% were comes under 51-60 years age group**(table 1).** Here 28 % samples had the history of trauma and 16% patients were known hypothyroid individual. Among 100% samples, 43% patients had diabetes mellitus more than 5 years, 24% patients had disease 5 years, and 13% had 4 years. As per Modified kuppuswamy scale 2020 disease prevalence was soughtas high in upper lower socio-economic class 59% and low in upper middle class11% people (table 1)[14]. As per American diabetes association, among 100 % samples of AC patients with HBA1c level, 75% were comes under diabetes category, 21% were under pre-diabetes category only 4% were in controlled range **(table2)**[15].V.P singh ed, al, in 2014 explained the pathology of AC in poor diabetic control[16].In PSS scale interpretation, pain subscale (max 30) shown among 100 samples, around 60% patients were in 11-20 score, only 18% had mild pain. As per satisfaction subscale nearly 54% patients, patience was affected i,e satisfaction was impaired. Only 14% had above 9 score. The functional subscale illustrated 41% patient function were impaired and categorized in to 21-40, 22% patient function were severely impaired and listed into 41-60. The total score of PSS score (max 100) shown 14% were categorized into 1-30 score, around 66% were categorized into 31-60 score and 20% were listed into 61-100 **(table3a)**[13]. The association of HBA1c level and PSS scale score in **table 4** shown, among 20% of good QOL patients category (PSS score 61-100), 11% in Diabetic group (HBA1C level 7-8%) and 8 % in pre diabetic group(HBA1C 6-7%) level. 66 % of dependent, deprived QOL patients category ( PSS score 31-60), only 12 patient comes under pre-diabetes and more than 50% of patients were in Diabetic (HBA1C level 9-10%), among 14% of dependent and severely deprived QOL patients category (PSS score 1-30) , only one patient in pre-diabetes and around 13 % were in diabetes that means ( HBA1C level >10%). The hypothesis of this study was, to prove the assumption and association between the PSS scale (Quality of life) and poor glycemic control. The statistical analysis shown **the p- value <0.005,** i.e. accept the alternate hypothesis (A1) **(table-4)**

**CONCLUSION**

In this cross sectional study we could understand the AC disease severity and importance of the early intervention. Among 100% only 20% had good QOL, around 66% patients were dependent and deprived QOL, 14% of patients were severely deprived in their life**(table-3b).** It forced the patients to dependent their housemate for day-today activity, toileting and bathing activity. It pushes them into anxious, inferiority. Consciously affect the patient mental health owing to difficulty in doing daily basic needs. However further studies with large sample size are warranted to substantiate the results.

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