

www.jmscr.igmpublication.org

Impact Factor 1.1147

ISSN (e)-2347-176x



Journal Of Medical Science And Clinical Research

IGM Publication

An Official Publication Of IGM Publication

## A Profile Study of Patients with Periarthritis Shoulder

Authors

**Arul Pragassame S<sup>1</sup>, Mohandas Kurup V K<sup>2</sup>**

<sup>1</sup>Lecturer in Physiotherapy

<sup>2</sup>Professor & Head

Division of PM&R, RMMC & H Annamalai University – 608 002, Tamilnadu, INDIA

Corresponding Author

**Arul Pragassame S**

Division of PM&R, RMMC & H Annamalai University – 608 002, Tamilnadu, INDIA

Email ID: arulphysio77@gmail.com

### Abstract-

**Background:** Periarthritis (PA) shoulder is a common disabling condition of shoulder. The clinical presentation of illness and factors influencing this condition need to be studied meticulously. This evaluation is pre-requisite for effective planning and implementation of rehabilitation program. Objective: To examine the profile of patients with PA shoulder and to identify the possible factors influencing this disabling condition.

**Methods:** The study was conducted in the Division of PM&R, RMMCH at Annamalai University. Evaluation of pain and shoulder abduction active range of motion (AROM) was performed. Further, the presence of comorbid conditions, type of occupation, duration of illness and demographic factors were examined by collecting history and through basic investigation procedure.

**Results:** Total number of patients was 78 (Male-49, Female-29). 52.6% (N=41) of patients had age range of 46-55 years. The majority of women patients were housewives 75.9% (N=22) and about 30.6% (N=15) of men were agricultural workers. 35.9% (N=28) of patients had diabetes mellitus and 17.9% (N=14) of

patients had cervical spondylosis. The other finding is that 23.1% (N=18) of patients had more than one associated comorbidities. 55.1% (N=43) experienced moderate level of pain and 32.1% (N=25) of the study patients had shoulder abduction AROM of 140°-159°. Further, it is observed that there was significant association observed for duration of illness Vs severity of pain ( $P=0.001$ ) and shoulder abduction AROM Vs severity of pain ( $P=0.009$ ).

**Conclusion:** The common age of occurrence of PA shoulder is between 46-55 years. Male patients were higher in number. Dominant shoulder was more commonly involved. Majority of patients were agricultural workers, manual labours and house wives. Patients are commonly associated with Diabetes Mellitus. Most of the patients are experiencing moderate level of pain and shoulder abduction AROM is between 120°-159° for majority of patients. There is positive association for duration of illness Vs severity of pain which further states that pain is higher in early stage of PA shoulder. Similarly there is positive association for shoulder abduction AROM Vs severity of pain that is shoulder AROM is limited when pain is higher and vice versa.

**Keywords** -Comorbidities, Demographic factors, Periarthritis shoulder, Shoulder abduction

## 1. INTRODUCTION

Periarthritis shoulder is a common musculoskeletal condition characterized by painful, gradual loss of active and passive shoulder motion. It has been reported that its prevalence is 2% to 5% in the general population<sup>[3,6,7,12,14,17,27,35]</sup> and around 10% to 36% in patients with diabetes mellitus.<sup>[2-4,6,17,21,27,29]</sup> It is characterized by 4 stages.<sup>[11,13,14,24,26]</sup>

**Stage 1** may last up to 3 months and during this stage patients describe sharp pain at end ranges of motion, achy pain at rest and sleep disturbance.

**Stage 2**, known as the “freezing” stage, presents with a gradual loss of motion in all directions due to pain and can last from 3 to 9 months. **Stage 3**, known as the “frozen” stage is characterized by pain

and loss of motion and lasts from 9 to 15 months.

**Stage 4**, known as the “thawing” stage is characterized by pain that begins to resolve but significant stiffness persists from 15 to 24 months after onset of symptoms.

It is a disabling condition as it causes difficulty in carrying out even day to day activities. Further, as the disease course is long and painful, it affects physical and mental well being of an individual, posing a great challenge to physiatrist and physical therapist in managing this problem. The financial burden for such long course of disease will take a heavy toll on patient and family members.

PA shoulder is classified into two categories: (i) Primary, which is idiopathic (or) (ii) Secondary,

which is traumatic in origin. [8,20,34,36] The etiology and pathophysiology of PA shoulder remain poorly understood. [7,11] It is observed that occurrence of primary PA shoulder is associated with certain factors. For example, studies [4,6,7,16,21,27] support that this condition is more common for patients with diabetes. It is also found that there is association of other comorbid conditions and PA shoulder. [9,11,15,18,22] Age and gender are non-modifiable risk factor for PA shoulder. Hence it is essential to carry out careful and meticulous investigation of clinical presentation and common factors associated with this condition. This will help in identifying the target group of population for PA shoulder and also useful in prevention and early intervention of this disabling problem.

## 2. METHODOLOGY

The study was carried out in the Division of Physical Medicine and Rehabilitation, RMMCH, Annamalai University.

### 2.1 Participants

78 patients diagnosed as PA shoulder and who met the following selection criteria were the chosen population. a) Clinical diagnosis of PA shoulder b) Both gender c) Unilateral involvement d) Patients with primary (idiopathic) PA Shoulder.

### 2.2 Evaluation Procedure

Through a structured questionnaire, history was collected with reference to demographic data,

duration of illness, occupational details and presence of associated comorbid conditions such as Ischemic Heart Disease (IHD), Hypertension (HTN), Diabetes Mellitus (DM) and Cervical Spondylosis (CS). Investigator in person ascertained the credibility of above information.

Pain severity was evaluated and categorized as mild (feeling of pain without restriction of daily activity or disturbance of sleep), moderate (pain severe enough to cause restriction of daily activity but no disturbance of sleep) and severe (pain severe enough to restrict daily activities as well as disturb sleep). [19] Shoulder abduction AROM was measured with a universal goniometer. Blood sugar investigation was carried out.

Frequency and percentage statistics was done for the study variables such as age, gender, side involvement, comorbid conditions, occupation, duration and severity of pain as well as abduction AROM. Test of association was carried out using chi-square test to study the relationship for the following variables duration of illness Vs severity of pain, comorbid condition Vs severity of pain, duration of illness Vs shoulder abduction AROM, occupation Vs shoulder abduction AROM and shoulder abduction AROM Vs severity of pain.

## 3. RESULTS

Data obtained in the present study was subjected to suitable and appropriate statistical analysis using statistical package for social sciences (SPSS-21). The mean age of the patients was  $53.44 \pm 7.33$  years. The age range distribution showed that, 52.6%

(N=41) of the patients belongs to the age category 46-55 years, 35.9% (N=28) of the patients belongs to the age group 56-65 years, whereas only 11.5% (N=9) of the patients were in the age range of 35-45 years. Out of 78 patients, 29 (37.2%) were female

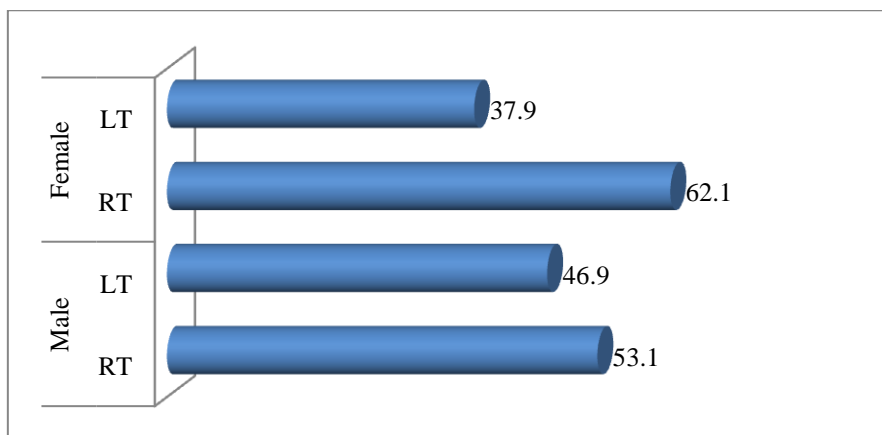
and 49 (62.8%) were male participants. Regarding occupation, 75.9% (N=22) of women were housewives and 30.6% (N=15) of men were agricultural workers. Occupational details of the patients are presented in Table 1.

**Table: 1.** Occupation of the Patient

Occupation	Male		Female		Total	
	No. of Patients	%	No. of Patients	%	No. of Patients	%
Housewife	-	-	22	75.9	22	28.1
Agricultural workers	15	30.6	-	-	15	19.2
Manual labour	8	16.4	4	13.8	12	15.4
Office worker	7	14.3	-	-	7	9.0
Professionals	6	12.2	1	3.4	7	9.0
Driver	2	4.1	-	-	2	2.6
Others	11	22.4	2	6.9	13	16.7
Total	49	100	29	100	78	100

With reference to side involved, right side was affected for 57.1 % (N=44) of the patients and left

side was affected for 42.9% (N=34) of patients. The graphical illustration is presented in figure 1.



**Fig.1:** Side Involved (%)

The data on comorbidities (Table 2) of the study patients showed that, maximum numbers 35.9% (N=28) of the patients are presented with diabetes mellitus, 17.9% (N=14) of the patients are associated with cervical spondylosis and 23.1%

(N=18) of the patients have more than one associated comorbidities. 12 patients (66.7%) have both diabetes and hypertension which is the most common combination of comorbidities.

**Table: 2.** Comorbidities

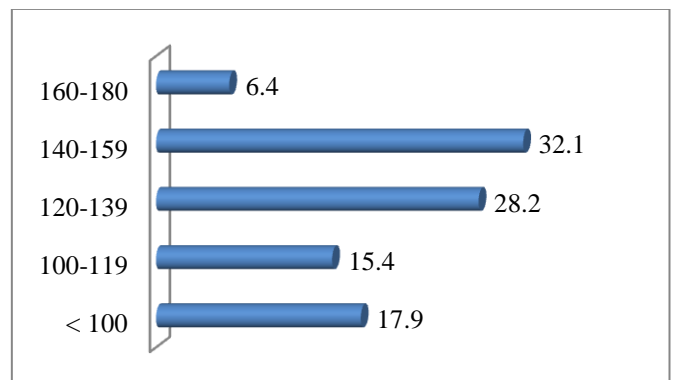
Comorbidities	Male		Female		Total	
	No. of Patients	%	No. of Patients	%	No. of Patients	%
Ischemic heart disease	3	6.1	-	-	3	3.8
Diabetes mellitus	17	34.7	11	37.9	28	35.9
Hypertension	5	10.2	2	6.9	7	9.0
Cervical spondylosis	5	10.2	9	31.1	14	17.9
No Comorbidities	8	16.4	-	-	5	10.3
More than one problems	11	22.4	7	24.1	18	23.1
Total	49	100	29	100	78	100

With reference to duration of condition, maximum number (64.1% N=50) of patients were presented with current symptoms for 3-9 months at the time of investigation (Table 3).

**Table: 3.** Duration of Illness

Duration of illness (months)	Male		Female		Total	
	No. of Patients	%	No. of Patients	%	No. of Patients	%
0-3	12	24.5	5	17.3	17	21.8
3-9	31	63.3	19	65.5	50	64.1
9-15	4	8.2	3	10.3	7	9.0
15-24	2	4.1	2	6.9	4	5.1
Total	49	100	29	100	78	100

With respect to severity of pain, maximum number (55.1% N=43) of patients were suffering with moderate intensity of pain and 22.6 % (N=20) had severe pain whereas only 19.3% (N=15) had mild pain (Table 4). Shoulder AROM evaluation showed that 32.1% (N=25) of patients were shoulder abduction range of 140°-159° and 28.2% (N=22) of patients were shoulder abduction range of 120°-139°. The detailed presentation of Shoulder abduction AROM is illustrated in figure 2.



**Fig. 2:** Shoulder Abduction AROM

**Table: 4.** Severity of pain

Severity of Pain	Male		Female		Total	
	No. of Patients	%	No. of Patients	%	No. of Patients	%
Mild	6	12.2	9	31.1	15	19.3
Moderate	26	53.1	17	58.6	43	55.1
Severe	17	34.7	3	10.3	20	22.6
Total	49	100.0	29	100.0	78	100.0

The associations of selected study variables (one variable on other) are carried out using Chi-square test and are presented in Table 5. There was positive association ( $P=0.001<0.01$ ) for duration of illness and severity of pain. Similarly positive association ( $P=0.009<0.01$ ) is observed for shoulder abduction

AROM and severity of pain. But there was statistically no significant association is observed for duration of illness and shoulder abduction AROM ( $P=0.478$ ), occupation Vs shoulder abduction AROM ( $P=0.351$ ) and comorbid Vs severity of pain ( $P=0.144$ ).

**Table: 5.** Test of Associations of Selected Variables

Variables	Chi-Square Value	P Value	Interpretation
Duration of illness Vs Abduction AROM	11.598	0.478	-
Occupation Vs Abduction AROM	26.038	0.351	-
Comorbid VS Severity of pain	14.683	0.144	-
Duration of illness Vs Severity of pain	44.060	0.001	+
Abduction AROM Vs Severity of pain	20.480	0.009	+

#### 4. DISCUSSION

The present study results showed that 52.6% of the patients were in age range of 46-55 years. Hence middle age is common life period where PA shoulder occurrence is maximum in the current study. The present study result on age of occurrence coincides well with the recent studies.<sup>[17,23,25-27]</sup> But the studies done 5 or more years back observed that PA shoulder is more

common in 5<sup>th</sup> to 6<sup>th</sup> decade.<sup>[1, 5, 13, 28, 31-33]</sup> Therefore it can be inferred that in recent years this condition starts little early.

In the present study male patients (62.8%, N=49) are comparatively higher than female patients (37.2%, N=29). Many previous studies report that women patients constitute maximum for this disabling shoulder condition.<sup>[3, 11,17,21,30]</sup> The current study was carried out in rural area of Chidambaram

where agricultural workers and manual labours represent maximal numbers. Men are usually performing this job and repetitive physical work demands on shoulder make them susceptible to undue pressure on the joint and surrounding structures which contributes early wear and tear. The majority of women patients (75.9%, N=22) enrolled in the present study were house wives. Again, physical demands of the shoulder joint put them into the risk of the PA shoulder.

Most of the patients (64.1%, N=50), at the time of visit were 3-9 months of duration. This means that, they are in 2<sup>nd</sup> stage (Freezing stage) of PA shoulder.

Pain severity shows that, 55.1% (N=43) of patient's have moderate pain and 22.6% (N=20) have severe pain. Chi square test of association is positive for duration of illness Vs severity pain. It is further inferred from cross tabulation (Table 6) that, pain severity is higher during 1<sup>st</sup> stage (0-3 months) of PA shoulder. Thereafter pain severity gradually reduces. In the 4<sup>th</sup> stage patient experiences only mild pain. As majority of patients in the present study were in freezing stage of PA shoulder, pain was prominent feature for them.

Regarding side of involvement, right shoulder is affected for 57.1% (N=44) of patients and left shoulder is affected for 42.9% (N=34) of patients. The trend is almost similar for both genders. Hand

**Table: 6.** Cross Tabulation for Duration of illness VS Severity of Pain

Duration of illness (months)	Severity of Pain			
	Mild	Moderate	Severe	Total
0-3	10	7	10	17
3-9	6	34	10	50
9-15	5	2	0	7
15- 24	4	0	0	4
Total	15	43	20	78

dominance could be the reason for such scenario. In the current study as previously stated manual labors, agricultural workers and housewives constitute bulk of population and repetitive work demands of dominant shoulder make them exposed to right shoulder pathology.

The other important finding is that most of the patient (except 8 members) present with associated comorbidities. The important associated medical conditions are 35.9% (N=28) diabetes, 17.9% (N=14) cervical spondylosis and 23.1% (N=18) have more than one associated medical conditions of which diabetes and hypertension is the most common combination representing 66.7% (N=12). Many of previous work have observed that diabetes is an important risk factor for PA shoulder.<sup>[4,6,7,16,21,27]</sup>

There is no positive association for specific associated comorbid condition and severity of pain. This means that pain severity is not dependent on the associated comorbid conditions. Shoulder abduction AROM was reduced for most of the patient. Further, positive association was observed for shoulder abduction AROM and severity of pain

i.e. when pain severity was more, AROM was less and vice versa (Table 7).

**Table: 7.** Cross Tabulation for Shoulder Abduction AROM VS Severity of Pain

Severity of Pain	Shoulder Abduction AROM					Total
	Below 100°	100°-119°	120° -139°	120° -139°	160° -180°	
Mild	2	4	5	2	2	15
Moderate	3	5	13	19	3	43
Severe	9	3	4	4	0	20
Total	14	12	22	25	5	78

Present study is an attempt to find out the possible association of factors such as demographic, occupational, duration of illness and comorbidities for PA shoulder. Some of the comorbidities such as dyslipidemia, lung diseases, thyroid diseases, obesity, auto immune disease and reflex sympathetic dystrophy syndrome were not included in the present study and which may be considered in future studies. Sample size can be increased to better identify clinical presentation and associated relationship of factors presenting with PA shoulder. Follow up studies can be undertaken at specified intervals to better understand the course of the diseases in different groups (age-wise, sex-wise, and occupation-wise).

## 5. CONCLUSION

The common age of occurrence of PA shoulder is between 46-55 years. Male patients were higher in number. Dominant shoulder was more commonly involved. Majority of patients were agricultural workers, manual labours and house wives. Patients

are commonly associated with diabetes mellitus. Most of the patients are experiencing moderate level of pain and shoulder abduction AROM is between 120°-159° for majority of patients. There is positive association for duration of illness Vs severity of pain which further states that pain is higher in early stage of PA shoulder. Similarly there is positive association for shoulder abduction AROM and severity of pain that is ROM is limited when pain is higher and vice versa. The current profile findings can be taken into account for effective preventive measures and appropriate rehabilitation program for PA shoulder.

## REFERENCES

- [1] Alvin C. powers. Diabetes mellitus .Fauci / McGraw-Hill's. Harrison's principle of internal medicine.17<sup>th</sup> ed. 2008; 1289-1316.
- [2] Arkkila PE Kantola IM, Viikari JS, ronnemaa T. shoulder capsulitis in type 1 and 2 diabetic patients: association with diabetic complication and related diseases. Ann Rheum dis. 1996; 55:907-14.
- [3] Aydeniz A, Gursoy S, Guney E. Which musculoskeletal complications are most frequently seen in type 2 diabetes mellitus? J Int Med Res.2008;36:505-511.
- [4] Balci N, Balci MK, Tuzuner S. Shoulder adhesive capsulitis and shoulder range of motion in type II diabetes mellitus: association with diabetic complications. J Diabetes Complications. 1999;13:135-140.
- [5] Binder AI, Bulgen DY, Hazleman BL, Roberts S. Frozen shoulder: a long-term prospective study. Ann Rheum Dis. 1984;43:361-4.



- [6] Bridgman JF. Periarthritis of the shoulder and diabetes mellitus. *Ann Rheum Dis.*1972;31:69-71.
- [7] Bunker TD, Anthony PP. The pathology of frozen shoulder. A Dupuyten-like disease. *J Bone Joint Surg Br.* 1995;77|:677-83.
- [8] Dias R, Cutts S, Massoud S. Frozen shoulder. *Br Med J* 2005; 331:1453-6.
- [9] Gispén JG. Painful shoulder and the reflex sympathetic dystrophy syndrome. In: Koopman WJ, ed. *Arthritis and Allied Conditions. A Textbook of Rheumatology* 14<sup>th</sup> edition. Philadelphia: Lippincott Williams & Wilkins 2001: 2095-142.
- [10] Griggs SM, Ahn A, Green A. Idiopathic adhesive capsulitis. A prospective functional outcome study of nonoperative treatment. *J Bone Joint Surg Am.* 2000;82-A:1398-1407.
- [11] Hannafin JA, Chiaia TA. Adhesive capsulitis. A treatment approach. *Clin Orthop Relat Res.* 2000:95-109.
- [12] Hand C, Clispsham K, Rees JL, Carr AJ. Long-term outcome of frozen shoulder. *J shoulder elbow surg* 2008;17:231-6.
- [13] James P. Tasto, MD and David W. Elias, MD. Adhesive Capsulitis. *Sports Med Arthrosc Rev.* Volume 15, Number 4, December 2007.
- [14] Kelley MJ, Shaffer M, Kuhn JE, Michener LA, Seitz AL, Uhl TL et al (2013) Shoulder pain and mobility deficits: adhesive capsulitis. *J Ortho Sports Phys Ther* 43 (5): A1-A31.
- [15] Laubscher P, Rosch, TG (2009) Frozen shoulder: a review. *SA Orthopaedic Journal.* Spring:24-9.
- [16] Lesquesne M, Dang N, Benasson M, Mery C. Increased association of diabetes mellitus with capsulitis of the shoulder and shoulder-hand syndrome. *Scand J Rheumatol* 1977.
- [17] Lundberg BJ. The frozen shoulder. Clinical and radiographical observations. The effect of manipulation under general anesthesia. Structure and glycosaminoglycan content of the joint capsule. Local bone metabolism. *Acta Orthop Scand Suppl.* 1969;119:1-59.
- [18] Mao CY, Jaw WC, Cheng HC. Frozen shoulder: correlation between the response to physical therapy and follow-up shoulder arthrography. *Arch Phys Med Rehabil* 1997; 78:857-9.
- [19] Malik A. Rauoof et al. Etiological factors and clinical profile of adhesive capsulitis in patients seen at the Rheumatology clinic of a tertiary care hospital in India. *Saudi Med J* 2004; Vol.25 (3).
- [20] Malone T, Hazle C. Rehabilitation of Adhesive Capsulitis. In; Ellenbecker TS, ed. *Shoulder rehabilitation. Non-operative treatment.* New York, NY; Thieme, 2006.
- [21] Milgrom C, Novack V, Weil Y, Jaber S, Radeva-Petrova DR, Finestone A. Risk factors for idiopathic frozen shoulder. *Isr Med Assoc J.* 2008;10:361-364.
- [22] Miller MD, Wirth MA, Rockwood CA. Thawing the frozen shoulder: The "Patient" patient. *Orthopedics* 1996;19(10):849-853
- [23] Neviasser JS. Adhesive capsulitis and the stiff and painful shoulder. *Orthop Clin North Am.* 1980;11:327-331.

- [24] Neviaser AS, Hannafin JA. Adhesive capsulitis: a review of current treatment. *Am J Sports Med.* 2010;38:2346-2356.
- [25] Neviaser RJ. Painful conditions affecting the shoulder. *Clin Orthop Relat Res.* 1983:63-69.
- [26] Neviaser RJ, Neviaser TJ. The frozen shoulder. Diagnosis and management. *Clin Orthop Relat Res.* 1987:59-64.
- [27] Pal B, Anderson J, Dick WC, Griffiths ID. Limitation of joint mobility and shoulder capsulitis in insulin- and non-insulin-dependent diabetes mellitus. *Br J Rheumatol.* 1986;25:147-151.
- [28] Reeves B. The natural history of the frozen shoulder syndrome. *Scand J Rheumatol.* 1975;4:193-6
- [29] Sattar MA, Luqman WA. Periarthritis: another duration related complication of diabetes mellitus. *Diabetes care* 1985
- [30] Sheridan MA, Hannafin JA. Upper extremity: emphasis on frozen shoulder. *Orthop Clin North Am.* 2006;37:531-539. <http://dx.doi.org/10.1016/j.ocl.2006.09.009>
- [31] Silvio E. Inzucchi . *Diabetes mellitus.* Lee Goldman / Saunders Elsevier. Cecil Medicine, 23rd ed.2008.pp 1123-1178
- [32] Siegel LB, Cohen NJ, Gall EP. Adhesive capsulitis: A sticky issue. *Am Fam Phycian.* 1999;59:1843-50.
- [33] V.Wright and A.M.M.M.Haq.Periarthritis of the shoulder. *Ann.rheum.Dis.*(1976) 35,213.
- [34] Warner JJ (1997) Frozen shoulder: diagnosis and management. *J Am Acad Orthop Surg* 5(3):130-140.
- [35] Wolf JM, Green A. Influence of comorbidity of self-assessment instrument scores of patients with idiopathic adhesive capsulitis. *J Bone Joint Surg Am* 2002;84:116-72 .
- [36] Zuckerman JD, Rokito A (2011) frozen sholder: a consensus definition. *J Shoulder Elbow Surg/Am shoulder surg* 20(2):322-325.