



**ORIGINAL RESEARCH PAPER**

**Orthopaedics**

**EPIDEMIOLOGICAL PROFILE OF SHOULDER PAIN PATIENTS AT A TERTIARY CARE CENTRE IN CENTRAL INDIA**

**KEY WORDS:** Shoulder pain, rotator cuff injury, periarthritis shoulder, DASH, Instable shoulder.

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**ABSTRACT**

**Background/Aim:** Shoulder pain is a common yet etiologically diversified complaint amongst patients presenting to an orthopaedic facility. In present study we describe the epidemiology and profile of shoulder pain patients. **Methodology:** This study was carried out over a period of three months at a tertiary care facility in Central India and included a total of 72 adult patients (>18 years) presenting with shoulder pain. Demographic profile, mode of injury, comorbidities, duration of pain, side involved, pain intensity (VAS) and Disability level (DASH) scores were noted. All the patients underwent clinical evaluation followed by radiological/MRI evaluation. Final diagnosis was based on MRI with clinical correlation. **Results:** Mean age of patients was 47.88±12.56 years (range 23-69 years), majority were women (51.4%) with involvement of right side (55.6%). Mean duration of pain was 9.49±5.74 months. A total of 31 (43.1%) patients had no history of injury, Trauma (27.8%) and occupational injury (25%) were the most common modes. Diabetic history was positive in 37.5% patients. Mean pain and DASH scores were 7.36±70.88 and 54.40±14.80 respectively. Periarthritis shoulder (40.3%), rotator cuff injury (25%) and subacromial impingement (15.3%) were the most common diagnoses followed by ACJ and glenohumeral arthritis (8.3% each). There was 1 (1.4%) case each of calcific tendinitis and instable shoulder respectively. **Conclusion:** Shoulder pain patients presented with moderate to severe pain and a high level of disability. Periarthritis shoulder and rotator cuff injury were the most common diagnoses.

**INTRODUCTION**

Shoulder pain is a common and disabling complaint. Shoulder pain is the third most common cause of musculoskeletal consultation in primary care, and approximately 1% of adults consult a general practitioner with new shoulder pain annually. The reported annual incidence of shoulder pain in primary care is 14.7 per 1000 patients per year with a lifetime prevalence of up to 70%<sup>1,2</sup>. In the community as many as 20% of the adult population experience shoulder symptoms at any one time, many of whom do not consult their doctor<sup>3</sup>, and these complaints seem to be increasing in incidence<sup>4</sup>. In India, nearly 2% of rural and 7.4% of urban population is affected by complaints of shoulder pain<sup>5,6</sup>.

Shoulder pain is a symptomatic manifestation of a multiple underlying etiologies. Some of the common ones include rotator cuff disorders, acromioclavicular joint (ACJ) disease and glenohumeral joint (GHJ) disorders<sup>7</sup>. Generally, the diagnosis is based on clinical tests only, however, a large proportion of patients complain of recurring complaint despite the treatment being done for the identified diagnosis<sup>8-10</sup>. Radiological/MRI diagnosis is helpful in identifying the underlying pathology in a more precise manner.

In the present study, we describe the profile of patients presenting with clinicodemographic and radiological profile of shoulder pain patients presenting over a period of three months at a tertiary care centre in Central India.

**MATERIAL AND METHOD**

This descriptive study was carried out over a period of three months at a tertiary care facility in Central India. All the consecutive adult patients aged >18 years presenting to the Department of Orthopedics with complaints of shoulder pain were enrolled in the study.

At the time of enrolment, demographic details of the patients were noted. Mode of injury (if any), presence of comorbid conditions (particularly diabetes), duration of pain, side involved and pain intensity (a 10-point VAS scale) were noted. Level of disability was assessed using Disabilities of the Arm, Shoulder and Hand (DASH) Score<sup>11</sup>. It is a 30-item scale that measures the functional disabilities of arm, shoulder and

hand during day-to-day routine life of patients. For each item scores range from 0 to 4. The sum of scores for all the items is divided by 30 and multiplied by 25 to obtain a score on a 100-point scale.

- All the patients underwent clinical examination that included
- Inspection of shoulders from the front, from the side and from behind for muscle wasting, swelling and deformity.
  - Examination of neck, axillae, and chest wall and for lymphadenopathy.
  - Assessment of range of movement of cervical spine. Palpation of sternoclavicular, acromioclavicular and glenohumeral joints for tenderness, swelling, warmth and crepitus.
  - Comparison of power, stability and range of movement (active, passive, resisted) of both shoulders. Scapular movements were observed and an attempt was made to locate painful arc (70-120° active abduction).
  - Passive external rotation.
  - Drop arm test
  - Specific shoulder tests (Jobe apprehension relocation test, Hawkins-Kennedy impingement test, Gerber liftoff test, Jobe test, Internal rotation resistance stress test, Gerber subcoracoid impingement test, Speed test, Yergason sign, Belly press test, External rotation stress test, External rotation lag sign, Drop sign, Internal rotation lag sign, Inferior sulcus test, Callway test, Hamilton ruler test, Duga test, Bryant sign), wherever needed.

After clinical examination a provisional diagnosis was made.

All the patients were subjected to radiological (X-ray)/MRI evaluation. Final diagnosis was based on MRI with clinical correlation. The final diagnosis was made on the subjective assessment of both clinical as well as imaging diagnoses by two trained orthopedicians (having more than 5 years' experience). The final diagnosis was made when there was an agreement between both the orthopedicians. In case of a disagreement between the two, it was referred to the third and senior-most orthopedician (having >15 years' experience) to reach at final diagnosis.

**Data Analysis:**

Descriptive analysis was done using Statistical Package for Social Sciences (SPSS) 21.0 version (IBM Inc, USA). Data has

been represented in terms of numbers (frequency) and percentages (proportions) or mean  $\pm$  standard deviation. As the study was a non-hypothetical descriptive study, hence no statistical tests for hypothesis testing were used.

**RESULTS**

A total of 72 patients presented to Department of Orthopedics during the three months of study period. Age of these patients ranged from 23 to 69 years. Majority of patients were mature adults aged 31-60 years (70.8%). Only (12.5%) were aged >60 years and 12 (16.7%) were aged  $\leq$ 30 years. Mean age of patients was 47.88 $\pm$ 12.56 years. Majority of patients were females (51.4%). Duration of complaints ranged from 1 to 27 months. Maximum patients had pain for 7-12 months (40.3%) followed by those having shoulder pain for  $\leq$ 6 months (33.3%) and >12 months (26.4%) respectively. Mean duration of shoulder pain was 9.49 $\pm$ 5.74 months. Maximum (n=31; 43.1%) patients did not report any injury history. There were 20 (27.8%) with a history of trauma, 18 (25%) reported of occupational injury and 3 (4.2%) had sports injury. Right side was more commonly involved (55.6%) than the left side (44.4%). A total of 27 (37.5%) patients had diabetic history. VAS scores for pain ranged from 5 to 9 with a mean of 7.36 $\pm$ 0.88. Disability scores (DASH) ranged from 22.5 to 78 with a mean of 54.40 $\pm$ 14.80 (Table 1).

A total of 45 (62.2%) patients were positive for HKI test (62.2%), Internal rotation resistance test was positive in 40 (55.5%), lift off test in 48 (66.7%), belly press test in 19 (26.4%), drop arm test in 29 (40.3%), inferior sulcus test in 9 (12.5%). There was 1 (1.4%) patient each positive for Yergason's test (Speed test), Callaway sign, Hamilton sign, Bryant sign and Duga sign respectively (Table 2).

Final diagnosis based on Clinico-radiological correlation was made as periarthritis shoulder (n=29; 40.3%) as the most common diagnosis followed by rotator cuff injury (25%), subacromial impingement (15.3%), ACJ arthritis and glenohumeral arthritis (8.3% each), calcific tendinitis and instable shoulder (1.4% each) respectively (Table 3).

**DISCUSSION**

Shoulder pain is a common complaint in daily life. However, it also assumes medical significance when it becomes unbearable and restricts the occupational and/or routine life functioning. Although, the proportion of patients visiting an orthopaedic facility for management of shoulder pain is very low yet it is highly important as the diagnostic work up of shoulder pain is often time-consuming and requires both skilful systematic evaluation with a systematic use of clinical, occupational and imaging information.

In the present study, majority of the patients presenting with shoulder pain were mature adults (mean age 47.88 $\pm$ 12.56 years) and females (51.4%). The age and sex profile of the patients in the present study is comparable to that reported by Garzedin *et al.*<sup>13</sup> who reported the mean age of patients as 50.4 years and proportion of females as 53.2%. Yarznbowicz<sup>14</sup> too in their study reported the mean age of patients in two study groups as 52.6 and 49.4 years and proportion of females as 56.5% and 46.1% respectively.

In the present study, majority of patients had shoulder pain for >6 months (66.7%). In fact, there were patients with shoulder pain upto 27 months. Mean duration of pain was 9.49 months. In the present study, thus most of the patients had chronic pain. This is similar to the observation of Yarznbowicz<sup>14</sup> who also had majority of patients with chronic pain ( $\geq$ 12 weeks) in both their study groups. However, Cadogan *et al.*<sup>12</sup> in their study reported a relatively much shorter duration of symptoms (Median 7 weeks) as compared to that in the present study. A high proportion of those having pain for >6 months in the present study might be owing to the fact that a high proportion of patients experiencing shoulder pain often tend to try home

remedies or indigenous facilities first and when they do not give relief then only do they turn to an orthopaedic facility.

In the present study, all the cases had unilateral shoulder pain and there was dominance of right (55.6%) over left side (44.4%). Though Garzedin *et al.*<sup>13</sup> in their study reported 9.1% bilateral cases, however, they also similar to the present study showed a dominance of right (57.1%) over left (33.8%) side. Cadogan *et al.*<sup>12</sup> too not only the right side was recognized as the dominant working side but was also found to be affected in majority of patients. Being a dominant working side, right shoulder has a higher risk of getting injured/ displaced during different functional events.

In the present study, a total of 27 (37.5%) patients had a diabetic history. Diabetic patients are at a higher risk of shoulder conditions like periarthritis and adhesive capsulitis<sup>15,16</sup>. Moreover, uncontrolled diabetes has also been shown to be related with high intensity shoulder pain and functional limitation<sup>17</sup>. The findings suggest that shoulder pain in diabetic patients should not be ignored as it may have serious underlying etiologies that need a specialized attention.

In the present study, mean VAS scores for pain (7.36 $\pm$ 0.88) were reflective of a dominance of moderate to severe pain and DASH scores showed a high degree of functional loss (Mean 54.40 $\pm$ 14.80). This implied that the patients generally visited our facility only when they had unbearable pain and high functional disability. On correlating pain and functional loss with duration of symptoms, we felt that most of the patients were ignorant regarding the need for medical attention to their pain and came at a stage when the disease had adopted a severe note.

In the present study, we employed as many as 11 clinical assessments to make out a clinical diagnosis. The major clinical abnormalities were (lift off test positivity – 66.7%; HKI test positivity – 62.2%, internal rotation resistance test – 55.5% and Drop arm test – 40.3%). Cadogan *et al.*<sup>12</sup> too in their study described a battery of clinical evaluations to reach on the final diagnosis. The multiplicity of clinical evaluations is primarily due to poor specificity of some of the physical examination tests as well as lack of uniformity in diagnostic labelling of shoulder pain.<sup>18,19</sup>

In the present study, we employed a clinicoradiological correlation to reach at the final diagnosis. Cadogan *et al.*<sup>12</sup> too in their study found need for clinico-radiological correlation to reach at some specific diagnoses like subacromial impingement. In view of the reported lower specificity of physical examination and need for imaging to improvise the diagnosis, in the present study we employed the safer route by correlating the two to reach at a final diagnosis.

In the present study, periarthritis shoulder (n=29; 40.3%) was the most common final diagnosis followed by rotator cuff injury (25%) and subacromial impingement (15.3%) as the major diagnoses. Compared to the present study, Garzedin *et al.*<sup>13</sup> in their study found rotator cuff injury as the most common etiology (80.7%). Dias *et al.*<sup>20</sup> too in their study found rotator cuff injury (54.3%) as the most common underlying pathology. Meislin *et al.*<sup>21</sup> in their study described rotator cuff disorders, adhesive capsulitis, and glenohumeral OA are all common causes of persistent shoulder pain, accounting for about 10%, 6%, and 2% to 5%, respectively, of all shoulder pain.

Keeping in view a high prevalence of patients with diabetes (37.5%), the diagnosis of periarthritis shoulder could be related to diabetic history of the patients<sup>15</sup>. We must also not forget that unlike the previous studies that had a relatively much shorter duration of symptoms, patients in the present study had presented with a much longer duration of

symptoms which could have contributed to difference in etiopathological profile of the present study as compared to that of previous studies.

The findings of the present study thus identified mature adults, particularly females and those with diabetes as a high risk patients for shoulder pain requiring an orthopaedic evaluation. The study also showed that most of the patients present after a substantial period of symptomatic onset and have moderate to severe pain and heavy functional loss. The findings of the present study indicate towards the need for early intervention and probable role of reliance on home-remedies and indigenous treatments for management of shoulder pain that might contribute to enhancement in burden of pain and disability. During the course of this evaluation we found that there is extreme shortage of studies describing the epidemiological and clinicopathological profile of shoulder pain cases. Further studies on larger sample size are recommended to elaborate the epidemiology of shoulder pain in greater detail.

**CONCLUSION**

Mature age, female sex, diabetes and delayed presentation were key characteristic of shoulder pain patients. Periarthritis shoulder, rotator cuff injury and subacromial impingement were the most common underlying etiopathologies.

**Table 1: Demographic Profile And Clinical Characteristics Of Patients**

SN	Characteristic	No.	%
1.	Age		
	≤30 years	12	16.7
	31-60 Years	51	70.8
	>60 Years	9	12.5
	Mean age±SD (Range) years	47.88±12.56 (23-69)	
2.	Sex		
	Male	35	48.6
	Female	37	51.4
3.	Duration of pain		
	≤6 months	24	33.3
	7-12 months	29	40.3
	>12 months	19	26.4
	Mean duration±SD (Range)	9.49±5.74 (1-27)	
4.	Mode of injury		
	Trauma	20	27.8
	Occupational injury	18	25.0
	Sports	3	4.2
	No history of injury	31	43.1
5.	Side involved		
	Left	32	44.4
	Right	40	55.6
6.	Diabetic history	27	37.5
7.	Mean Pain Score±SD (Range) VAS	7.36±0.88 (5-9)	
8.	Mean disability score (DASH)±SD	54.40±14.80 (22.5-78)	

**Table 2: Physical Evaluation and Diagnostic Tests**

SN	Characteristic	No.	%
1.	Hawkins Kennedy Impingement (HKI) Test	45	62.2
2.	Yergason's test (Speed test)	1	1.4
3.	Internal Rotation Resistance test	40	55.5
4.	Lift off test	48	66.7
5.	Belly Press test	19	26.4
6.	Drop Arm test	29	40.3
7.	Inferior sulcus test	9	12.5
8.	Callaway sign	1	1.4
9.	Hamilton sign	1	1.4
10.	Bryant sign	1	1.4
11.	Duga sign	1	1.4

**Table 3: Final Diagnosis Based On MRI/Radiology And Its Clinical Correlation**

SN	Characteristic	No.	%
1.	Periarthritis shoulder	29	40.3
2.	Rotator cuff injury	18	25.0
3.	Subacromial impingement	11	15.3
4.	ACJ arthritis	6	8.3
5.	Glenohumeral arthritis	6	8.3
6.	Calcific tendinitis	1	1.4
7.	Instable shoulder	1	1.4

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