

**Original Research Article**

Cross Sectional Study to Determine Aetiopathologies of Pain Shoulder in a Tertiary Care Hospital of India

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Abstract

Shoulder pain is a very common musculoskeletal disorder and can result from various pathologies. Though there is a tendency to primarily diagnose almost all cases as 'frozen shoulder', careful evaluation and investigations reveal different pathologies in most of the cases. The aim of this cross sectional study was to find out the various pathological conditions presenting as shoulder pain. A total of three hundred patients suffering from shoulder symptoms were included in this observational study conducted in a tertiary care hospital of India and they were evaluated by routine clinical examination, specific clinical tests including Neer test, Hawkins-Kennedy test, Clancy test, Drop Arm test, Empty Can test, cross chest adduction test, O'Brien test, speed test, Yergason test, Gerber lift off test etc. as well as radiological investigations like X-ray, USG and MRI. Among the various pathologies detected, supraspinatus tendinitis and adhesive capsulitis lead the list. Women outnumber men as patients and there is significant difference in disease pattern between genders. While periarticular muscle pathology predominates among male patients, non-muscular causes top the list in female patients. Moreover majority of men have dominant shoulder affection in contrast to the women who mostly suffer from the shoulder disease of the non-dominant side.

Keywords: Shoulder Pain, Periarticular Muscles, Rotator Cuff, Adhesive Capsulitis, Laterality.

Introduction

Shoulder pain is a disabling problem and a frequent reason for medical consultation. It is a very common musculoskeletal disorder. Defining shoulder symptoms has a number of difficulties. The complex interrelations between shoulder and adjacent areas and occurrences of referred pain make clinical case definition problematic¹. It is

important to investigate shoulder pain in the community to understand the full impact of such complaints on the general population. However most of the referred cases of pain shoulder come to the department of Physical Medicine & Rehabilitation primarily diagnosed as frozen shoulder, often a misleading term, as careful evaluation and investigations reveal different

pathologies in most of the cases. Shoulder joint is a complex joint traversed by muscles and tendons². Intrinsic factors originate from shoulder girdle and include glenohumeral and periarticular disorders whereas extrinsic factors occur outside the shoulder girdle with secondary referral pain to the shoulder. Accurate evaluation, diagnosis and treatment require a thorough understanding of shoulder anatomy including referral pain patterns³. In establishing a diagnosis it is important to consider the patients' age, gender, occupation, laterality and chief complaint. A meticulous study with the help of both thorough clinical examination and various appropriate investigations may help us to find out the exact nature of different underlying pathologies of pain shoulder and it may also throw some important light on the association of various aetiologies with different demographic factors.

Aims and Objectives

This cross sectional study is designed to find out the different pathologies behind painful shoulder among patients attending outpatient of the department of P. M. & R of a tertiary care hospital of India. The study is also conducted to observe the variation of disease pattern among different genders, laterality and occupations.

Materials & Methods

The study was conducted in the department of physical medicine & rehabilitation, B. S. Medical College & Hospital, Bankura, West Bengal, India during the period from December 2017 to November 2018. Patients with pain shoulder with or without functional impairment of all genders attending the department of physical medicine & rehabilitation were included in the study. The patients suffering from specific or non-specific septic arthritis, fracture, dislocation or subluxation of glenohumeral and acromioclavicular (AC) joint, neoplasm and congenital deformity of shoulder, and pregnant women were excluded from the study population. A total of three hundred patients were included in this cross-

sectional observational study. Informed consent was obtained from all the individuals and study was carried out in accordance with the institutional ethics committee guidelines.

Demographics and medical history were taken for all patients. Physical examinations including tenderness, active and passive range of motion (ROM), pain in shoulder movement and neuromuscular examinations of upper extremity were done. Special tests to find out impingement and rotator cuff pathology including Neer test⁴, Hawkins-Kennedy test⁵, Clancy test², Drop Arm test⁶, Empty Can test⁵ etc. were used as required. Specific clinical tests to detect AC joint pathologies like Cross Chest Adduction test & O'Brien test², as well as special clinical tests to identify bicipital tendinitis like Speed test and Yergason test^{5, 6} were also utilized. The Gerber lift off test and the Gerber push with force test⁵ were also used to assess the subscapularis. Radiological investigations are of immense importance for accurate detection of various shoulder pathologies. Despite the availability of more advanced imaging modalities, X-ray remains the first imaging test to be performed in the investigation of any shoulder pain. However, with their increasing availability, ultrasound and magnetic resonance imaging have in recent years become first-line techniques for the diagnostic imaging of the shoulder⁷. Accordingly our study was conducted with the help of X-ray, USG^{8, 9, 10} and MRI^{11, 12, 13} as required for different entities.

Results

After thorough clinical and radiological examinations twenty patients were found to be suffering from referred pain from myofascial pain syndrome involving upper back or neck and one patient was diagnosed as a case of thoracic outlet syndrome. Hence data collected from two hundred and seventy-nine patients suffering from different shoulder pathologies were analysed statistically using appropriate tools. The age of the patients ranged from 23 to 78 years. The mean age was 47.1 years. Age composition of our study

population showed that 30% of patients were above the age of 60 years, while 65% of patients were in the age-group of 40 - 60 years, and only 5% of patients belonged to less than 40 years group. Number of male and female patients were 113 (40.5%) and 166 (59.5%) respectively. Eleven patients were found to be left handed while the rest of the patients were right handed. Majority (71.68%) of male patients were manual worker and most (76.51%) of the female patients were found to be homemaker.

Different shoulder pathologies have been identified with some interesting observations in relation to gender, occupation and hand of dominance (Table 1). Supraspinatus tendinitis (19.71%) was found to be the most common pathology associated with shoulder pain closely followed by the adhesive capsulitis (18.64%). Among male patients the former (16.81%)

exceeds the later (14.16%) while in females both (21.69%) scores equally. Bicipital tendinitis (11.83%) and Subacromial-Subdeltoid bursitis (10.04%) are also found to be quite common. Structure wise, supraspinatus is found to be the most commonly involved entity (36.19%) affecting more than one third of the cohort. Majority (61.06%) of male patients had periarticular muscle pathology while non-muscular pathologies, as a group, (52.42%) exceeds periarticular muscle problems in female patients. A few cases of rare disease like osteonecrosis were also seen.

Interestingly in our study it has been found that 67.5% male patients had shoulder affection on the dominant side while 72.1% female had shoulder pain involving non dominant side ($p < 0.001$). Only 3.4% patients had bilateral shoulder involvement.

Table 1: Different Shoulder Pathologies in Male and Female Study Population

Shoulder Pathology	No. of Patient	Percentage of Patient	No. of Male Patient	No. of Female Patient	Percentage of Male Patient	Percentage of Female Patients
Supraspinatus Tear (complete)	10	3.58	6	4	5.31	2.41
Supraspinatus Tear (partial)	18	6.45	10	8	8.85	4.82
Supraspinatus Tendinitis	55	19.71	19	36	16.81	21.69
Supraspinatus Calcification	18	6.45	5	13	4.43	7.83
Subscapularis Tear	6	2.15	3	3	2.65	1.81
Ac joint Arthropathy	25	8.96	9	16	7.96	9.64
Bicipital Tendinitis	33	11.83	20	13	17.7	7.83
Adhesive Capsulitis	52	18.64	16	36	14.16	21.69
Subacromial - Subdeltoid Bursitis	28	10.04	11	17	9.73	10.24
Osteoarthritis Shoulder	3	1.08	0	3	0	1.81
Osteonecrosis	2	0.72	2	0	1.77	0
Glenohumeral Instability	21	7.53	6	15	5.31	9.04
Rupture of Long Head of Biceps	8	2.87	6	2	5.31	1.2

Discussion

In this study majority of patients were found to be suffering from pathology of rotator cuff and other periarticular muscles. Morphologically the shoulder joint stability is sacrificed for mobility and a major proportion of stability is shared by the periarticular muscles, its dynamic stabilizer. Probably because of this typical anatomical

structure and biomechanical arrangement of shoulder, rotator cuff and other periarticular structure are more prone to injury and leading cause of shoulder pain which is reflected in our study. Predominance of periarticular muscle pathologies in male patients is possibly associated with greater demand of work on muscles as most of the male patients were manual worker.

Statistically significant difference ($p < 0.001$) between male and female patients in respect to affection of dominant versus non-dominant side in our study is really interesting. Occupation wise most (71.68%) of the male patients were manual worker while majority (76.51%) of the female patients were found to be homemaker. It may be hypothesized that substantially greater work load on the dominant shoulder among manual workers may be the reason behind predominance of dominant side affection among male cohort. On the other hand, day to day activities of homemakers clearly need greater bilateral involvement and that may impose extra burden on relatively unaccustomed and untrained upper limb of non dominant side resulting into greater cumulative damage to the joint structures and predominant shoulder involvement of non-dominant side.

Conclusion

Among the patients suffering from shoulder pain attending outpatient of the department of Physical Medicine & Rehabilitation of an Indian tertiary care hospital, female patients predominate in number over males. Painful shoulder results from different structure and different pathologies, supraspinatus tendinitis and adhesive capsulitis being the leading causes. Periarticular muscle pathologies, as a group, tops the list of male patients and their association with dominant hand and manual work is quiet evident. On the contrary, the non-muscular pathologies are predominant among female population and they are found to be more associated with shoulder of nondominant side which may possibly be related with increased demand on nondominant upper limb in the daily activities of the homemakers.

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