

Epidemiology and risk factors for Rotator cuff tears in Indian population

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KEYWORDS

Rotator cuff tear, shoulder disorders, Indian population, risk factors, comorbidities, rotator cuff epidemiology.

ABSTRACT

Introduction: Rotator cuff disorders are a prevalent shoulder problem in clinical settings. The incidence of rotator cuff tears in cadaveric studies ranges from 5% to 40%, with multifactorial etiology. Limited data exists on the epidemiology of rotator cuff tears in the Indian population. This study aims to evaluate risk factors and demographic features associated with symptomatic rotator cuff tears.

Materials and Methods: This prospective observational study was conducted at a tertiary care center in Bangalore, India, involving 105 patients with MRI-confirmed full-thickness rotator cuff tears. A one-time evaluation assessed risk factors, demographic characteristics, and physical examination findings, including range of motion, strength, and impingement. Data were analyzed with descriptive statistics and the Chi-square test to explore associations between age, gender, comorbidities, and rotator cuff tears.

Results: The age distribution showed 5.48% in 31-40 years, 23.81% in 41-50 years, 40.95% in 51-60 years, 22.86% in 61-70 years, and 6.90% in >70 years. The male-to-female ratio was 1.56:1, with a significant gender difference ($p = 0.03$). Right shoulder involvement was more common (68.10%), with the dominant shoulder affected in 65 patients. Hypertension (29.5%) and type 2 diabetes (24.8%) were the most common comorbidities.

Conclusion: Increasing age is the primary risk factor for rotator cuff tears, with risk rising proportionately with age. Hypertension and diabetes mellitus are common comorbidities associated with rotator cuff disease in the Indian population.

1. Introduction

Rotator cuff disorders are one of the common shoulder problems seen in our clinics. There are various studies in literature estimating the burden of the disease. The incidence of rotator cuff tears in cadavers ranged from 5% to 40%. The etiology of these cuff tears is multifactorial (1-3). With increasing knowledge and new diagnostic tools there is a revolution in effectively managing these cuff tears. To best of our knowledge very little information is available on epidemiology of rotator cuff patients in Indian population (4-10). Purpose of this study was to evaluate various risk factors and demographic features associated with symptomatic rotator cuff tears in our population.

2. Materials and Methods

The study was conducted in a tertiary care Centre in Bangalore, India. It included 105 patients, symptomatic for rotator cuff tears. All these patients confirmed to have full thickness tears on MRI scan. All the subjects underwent one time evaluation for assessment various risk factors, demographic features and symptoms of rotator cuff tears. Physical examination was also conducted on these patients to evaluate range of motion, strength and impingement. Descriptive statistics of rotator cuff tear in different age, comorbidities, gender will be analyzed and summarized in terms of percentage, Chi square test would be used to find the association between age, gender, comorbidities, dominant arm and Rotator cuff tear. Logistic Regression Analysis was done to find the independent risk factors for Rotator cuff tear.

3. Results

A prospective observational study included 105 patients with rotator cuff injury presenting at Ramaiah Hospitals, Bangalore, India. Symptomatic patients with MRI-proven full-thickness tears were included in the analysis.

In the age group 31-40 years we had 5.48%, in the age group 41-50 years we had 23.81%, 51-60 years we had 40.95% and in the age group 61-70 years we had 22.86% and in the age group > 70 years we had 6.90%. In our

study, the age of the cases ranged between 37 years and 76 years.

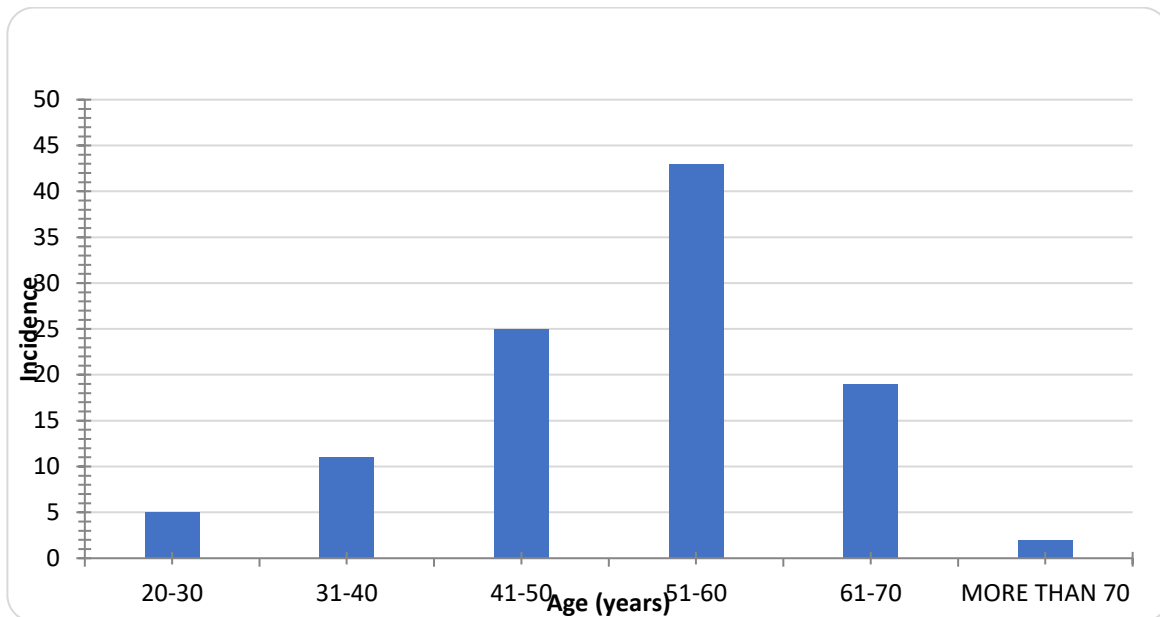


Figure 1: Age and Incidence of Rotator Cuff Tear

In the study, we had 39.05% females and 60.95% males. The male-to-female ratio was 1.56:1. The gender as a risk factor was 1.34. The gender difference was statistically significant with a p-value of 0.30.

Among the all the participants in the study, 31.90% were on the left side whereas 68.10% were affecting the right shoulders. Sixty-five patients had involvement of dominant shoulder whereas forty patients had involvement of the non-dominant shoulder

Hypertension was the most common comorbidity seen in 31 patients. Type 2 diabetes mellitus was the second common comorbidity seen in 28 patients. Twelve patients with symptomatic cuff tear had hypothyroidism.

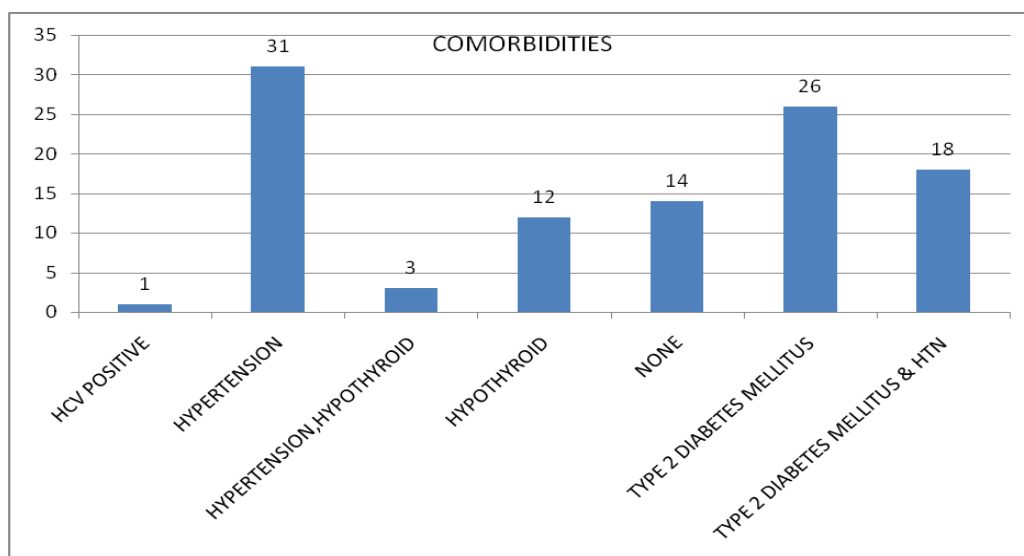


Figure 2: Co-morbidities associated with Rotator Cuff Tear

4. Discussion

Understating the natural history and epidemiology of rotator cuff tears is very important in making appropriate decisions regarding the treatment of rotator cuff tear. Full-thickness rotator cuff tears are present in approximately 25% of individuals in their 60s and 50% of individuals in their 80s. Asymptomatic full-thickness rotator cuff tears are common, increase in incidence with aging, and are present in approximately 50% of patients

over age 65 with a contralateral symptomatic full-thickness tear. The etiology of rotator cuff tears is multifactorial. The common risk factors include age, trauma, smoking, diabetes, hypertension, and hypercholesterolemia.

Age

In our study, we noted that there was a linear association between increasing age and the incidence and severity of the tear (Figure 1). This is in line with the findings of the study by Atsushi Yamamoto et al (12). The current study showed 20.7% of the subjects had full-thickness rotator cuff tears and the rate of occurrence also increased with age. The prevalence of cuff tears increased up to 50% in the eighth decade.

We noted that in both males and females, the age group 51-60 years had the most number of cases 26.67%, thus indicating that the diseases affect the middle-aged population during their productive life years. A study conducted by Abate M et al in 2014 reported that the prevalence of asymptomatic full-thickness tears is increased in the postmenopausal period, and there is an association between tears and metabolic disorders (13).

Gender

In the study, we had 39.05% females and 60.95% males. The male-to-female ratio was 1.56:1. The gender as a risk factor was OR 1.34. The gender difference was statistically significant with a p-value of 0.30. Gumina S et al in 2013 proved that gender was not a significant risk factor for degenerative rotator cuff tear (14)

Side involvement

In our study, the right shoulder was the commonly involved side. Among all the participants in the study, 31.90% were on the left side whereas 68.10% were affecting the right shoulders. Sixty-five patients had involvement of the dominant shoulder whereas forty patients had involvement of the non-dominant shoulder. Gumina et al in 2013 proved that hand dominance was a risk factor for degenerative rotator cuff tear.

Comorbidities

In our study, we noted hypertension was the most common co-morbidity associated with full thickness rotator cuff tears (Figure 2). It was associated with 31 patients (29.5%). Hypertension causes peripheral hypovascularity and hence is associated with degenerative rotator cuff diseases. Stefano Gumina et al in his study have showed a relationship between arterial hypertension and the size of the cuff tear (14). Patients with hypertension have a significantly higher prevalence of large and massive tears. Hypertensive individuals were 2 times more likely to experience a large tear and 4 times more likely to experience a massive tear than normotensive individuals. The odds ratio of hypertension having rotator cuff injury was 2.97 in our study. Harbir Kaur et al noted that hypertension were a significant risk factor for atraumatic rotator cuff tear according to their study (15).

Diabetes mellitus is a well-known risk factor associated with rotator cuff disease which includes tendinitis to full thickness tears and cuff arthropathy. These tears are more common in patients with uncontrolled diabetes. Twenty six patients (24.7%) had diabetes mellitus type 2 associations with these full thickness tears. Rechart et al in their study showed association between type 1 and 2 diabetes to rotator cuff tears (16). The odds ratio of diabetes mellitus having rotator cuff injury was 4.57 in our study.

Thyroid disorders are the other common metabolic disorders which are associated with rotator cuff diseases. Oliva F et al in their study showed a significant association between rotator cuff tears and thyroid disorders (17). Twelve patients in our study had an association with hypothyroidism.

Studies suggest chemical signals are triggered by conditions including diabetes mellitus, hypertension, smoking, and advanced age. These conditions also cause excessive apoptosis, which obstructs current elimination channels due to poor vascularity, changes in material properties, and changes in matrix composition (18).

5. Conclusion

The etiology of rotator cuff disease is multifactorial. Increasing age is the single most important risk factor for development of rotator cuff tears and risk increases proportionately with age. Diabetes mellitus, hypertension are the common comorbidities which influence the development of these tears in our Indian population.

Author Contribution

Dr. Yashavanth Kumar C: Conceptualization, Methodology, Investigation, Manuscript Writing

Dr. Manjunatha R: Methodology, Patient follow-up, Statistics, Manuscript Writing

Dr. Kiran Shankar: Reviewing and Supervision, Manuscript Writing,

Dr. Vinay Kumar B R: Reviewing and Supervision, Manuscript Writing,

All authors read and approved the final version of the manuscript

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