

Prevalence of Symptomatic and Asymptomatic Rotator Cuff Tears in General Population Attending Health Care Camps at Tertiary Care Hospital

Dr. Akshay Itankar¹, Dr. Pratik Bhujbal¹, Dr. Sanjay Jadhav², Dr. Manish Chatte³, Dr. Srinivas Ugale⁴, Dr. Mahendrakumar Bendale³, Dr. Sagar Shamrao Chaudhari^{1*}

¹Junior Resident, Department of Orthopedics, SMBT Institute of Medical Sciences and Research Centre, Nandi Hills, Dhamangaon, Dist, Igatpuri, Maharashtra 422403, India

²Professor, Department of Orthopedics, SMBT Institute of Medical Sciences and Research Centre, Nandi Hills, Dhamangaon, Dist, Igatpuri, Maharashtra 422403, India

³Assistant Professor, Department of Orthopedics, SMBT Institute of Medical Sciences and Research Centre, Nandi Hills, Dhamangaon, Dist, Igatpuri, Maharashtra 422403, India

⁴Senior Resident, Department of Orthopedics, SMBT Institute of Medical Sciences and Research Centre, Nandi Hills, Dhamangaon, Dist, Igatpuri, Maharashtra 422403, India

DOI: [10.36347/sjams.2023.v11i03.025](https://doi.org/10.36347/sjams.2023.v11i03.025)

| Received: 11.02.2023 | Accepted: 18.03.2023 | Published: 22.03.2023

*Corresponding author: Dr Sagar Shamrao Chaudhari

Junior Resident, Department of Orthopedics, SMBT Institute of Medical Sciences and Research Centre, Nandi Hills, Dhamangaon, Dist, Igatpuri, Maharashtra 422403, India

Abstract

Original Research Article

Background: With the aging society, musculoskeletal degenerative diseases are becoming a burden on Society, and rotator cuff disease is one of these degenerative diseases. The purpose of this study was to examine the incidence of Rotator cuff tear is the most common shoulder disease in patients with shoulder problems, at tertiary care hospital. **Material and methods:** A total of 700 patients examined. Ultrasonography on bilateral shoulders was performed in all the participants. **Results:** 165 subjects out of 700 participants (23.5%) had full-thickness rotator cuff tears. The prevalence of rotator cuff tear in each decade was 0% in the 20s to 40s, 14.7% in the 50s, 21.5% in the 60s, 31.2% in the 70s, and 32.6% in the 80s. Symptomatic rotator cuff tears accounted for 32.2% of all tears and asymptomatic tears for 67.8%. The prevalence of asymptomatic rotator cuff tears was one-half of all tears in the 50s, whereas it accounted for two-thirds of those over the age of 60. The prevalence of tear was significantly greater in male than in female in the 50s and 60s, but not in the 70s and 80s. **Conclusion:** The prevalence of rotator cuff tear in the general population was 21%, which increased with age. Asymptomatic tear was twice as common as symptomatic tear.

Keywords: Rotator cuff disease, etiology, elderly.

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INTRODUCTION

Rotator cuff tear pathogenesis is still unknown. It is likely to involve a number of factors such as a genetic predisposition, extrinsic impingement and biomechanical imbalance from structures surrounding the cuff and intrinsic degeneration from changes within the tendon itself and finally co-morbidities.¹ Rotator cuff tears are the most common non-traumatic upper limb cause of disability in people over 50 years, and they may be considered as a natural age-related process, with a statistically significant increase after that chronological age. With the aging society, degenerative diseases of the musculoskeletal system are becoming more prevalent and a burden on society². Osteoarthritis (OA) is the most prevalent degenerative disease,

particularly among those older than 65, and one of the most common sources of pain and disability³. It is most likely that the very existence of a cuff tear does not always cause shoulder symptoms. In the literature, there have been many reports describing the existence of the asymptomatic rotator cuff tears in large numbers.⁴⁻⁶ The purpose of this study was to clarify the prevalence of symptomatic and asymptomatic rotator cuff tears in the population attending the free orthopedic checkup camps at tertiary health center.

METHODOLOGY

A total of 700 subjects attended free orthopedic checkup camps at tertiary health centre. 235 males and 465 females with a mean age of 69.5 years

Citation: Akshay Itankar, Pratik Bhujbal, Sanjay Jadhav, Manish Chatte, Srinivas Ugale, Mahendrakumar Bendale, Sagar Shamrao Chaudhari. Prevalence of Symptomatic and Asymptomatic Rotator Cuff Tears in General Population Attending Health Care Camps at Tertiary Care Hospital. Sch J App Med Sci, 2023 Mar 11(3): 629-632.

(range, 20-85). All the subjects were informed their check up and obtained their consent to participate in this study. A demographic data, dominant hand, occupation, presence or absence of shoulder pain, and past history of shoulder pain had been sent to all of participants before the check-up. Demographics of the participants were shown in Table 1. All subjects had no history of shoulder surgery. In this study, “asymptomatic” was defined as having neither pain nor any other symptoms related to the shoulder when the survey was conducted including the past history of shoulder pain, whereas “symptomatic” was defined as having pain or any other symptoms related to the shoulder when the survey was conducted.

Ultrasonography:

A single experienced orthopedic surgeon with use of a ultrasound machine with linear-array probes performed the diagnostic procedure. The arm position during the examination was in slight extension and neutral rotation of the shoulder joint. The supraspinatus and infraspinatus tendons were observed by ultrasound. The long-axis ultrasound scan for the supraspinatus tendon was done at the anterior and posterior levels of the superior facet of the greater tuberosity⁷ and the long-axis scan for the infraspinatus tendon at the middle facet of the greater tuberosity. The defect or concave surface of the rotator cuff tendon was considered to indicate a full-thickness rotator cuff tear. Only those with full-thickness tear was included in the tear group. The tear size was classified as a small, medium, or large tear according to the Cofield’s classification⁸

Statistical Analysis:

The recorded data was compiled and entered into a spreadsheet computer program (Microsoft Excel 2007) and then exported to the data editor page of SPSS version 20 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages, means, and standard deviations.

RESULTS

165 subjects out of 700 participants (23.5%) had full-thickness rotator cuff tears. Of them, symptomatic rotator cuff tears accounted for 42.4% (70 out of 165 subjects) and asymptomatic tears for 57.57% (95 out of 165 subjects). The prevalence of rotator cuff tear in each decade was 0% in the 20s to 40s, 14.7% in the 50s, 21.5% in the 60s, 31.2% in the 70s, and 32.6% in the 80s (Fig 1). The prevalence of tears significantly increased with age. 48 out of 165 (29.09%) subjects had bilateral rotator cuff tears. On a gender basis, 70 out of 235 male subjects (29.78%) had rotator cuff tears and 95 out of 465 female subjects (20.43%), there being no significant difference. The prevalence of rotator cuff tears significantly increased with age both in male and female subjects. The prevalence in males was significantly greater than in females in the 50s and 60s

($p < 0.0001$), but not in the 70s and 80s. Asymptomatic rotator cuff tears accounted for 50% of all tears in the 50s but in those older than 60 years of age, the prevalence of asymptomatic rotator cuff tears was significantly greater than that of symptomatic tears ($p < 0.0001$) and twice the prevalence of symptomatic tears. The prevalence of symptomatic and asymptomatic rotator cuff tears significantly increased with age ($p = 0.0015$).

With regard to the tear size, the small-sized rotator cuff tear were most commonly seen (69.3%) in subjects in their 50s, there being no large-sized tear. However, the prevalence of the large-sized tear increased with age and the large-sized tear accounted for a substantial fraction of tears in the 60s, 70s and 80s (43.8%, 45.1%, 43.9%, respectively). The prevalence of the small-sized tear also increased with age. The rotator cuff tear in the dominant side, prevalence was 17.8% in the right handed and 17.4% in the left handed, whereas the prevalence of tear in the non-dominant side was 10.8% and 17.4%, respectively. In the occupation category, the prevalence of rotator cuff tear of farmers was 55% which was significantly greater than that of non farmers people (30%) and others (15%).

There was a single tendon tear of the supraspinatus in 204 out of 1400 shoulders (14.57%). Of them, a tear of the anterior half of the supraspinatus tendon was observed in 69 out of 1400 shoulders (4.92%), a tear of the posterior half in 48 shoulders (3.42%), and a tear of the whole tendon in 108 shoulders (7.71%). A tear involving both the supraspinatus and infraspinatus tendons was observed in 265 out of 1338 shoulders (18.92%), whereas a tear of the infraspinatus tendon alone was observed in 5 shoulders (0.3%).

Table 1: Demographic Data

| | |
|-----------------------|--------------------|
| Total Number | 700 |
| Mean Age | 69.5 (range 20-85) |
| Sex | |
| Male | 235 |
| Female | 465 |
| Dominant Hand | |
| Right | 640 (91.42) |
| Left | 60 (8.57) |
| Occupation | |
| Farmers | 385 (55%) |
| Non Farmers | 210 (30%) |
| Others | 105 (15%) |
| Shoulder Pain History | |
| No Pain | 60% |
| Once/ Twice per day | 21% |
| Intermittent | 15% |
| Always | 4% |

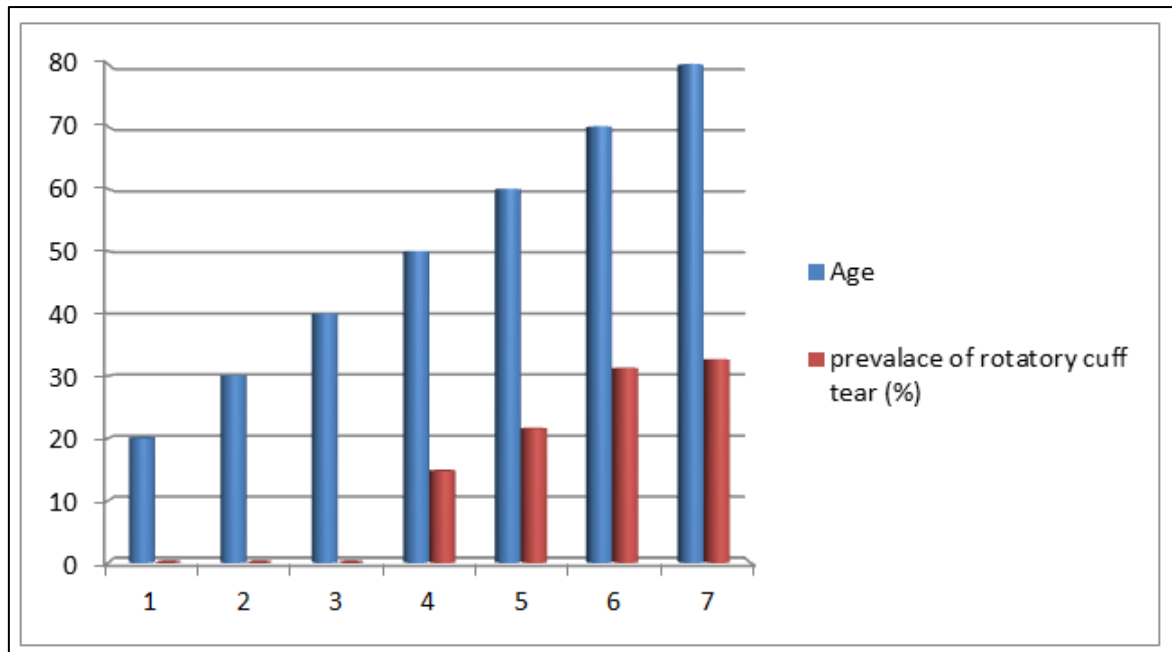


Fig 1: Prevalence of rotator cuff tears in each decade. The prevalence of full-thickness rotator cuff tear in each decade was 0% in the 20s to 40s, 14.7% in the 50s, 21.5% in the 60s, 31.2% in the 70s, and 32.6% in the 80s

DISCUSSION

In our study the true prevalence of rotator cuff tears including both asymptomatic and asymptomatic rotator cuff tears in the general participants has been studied. Various cadaveric or imaging studies, had shown the prevalence of rotator cuff tears, Cadaveric studies reported that the was 3-39%.⁹⁻¹³ Studies using MRI or ultrasonography⁵⁻⁶, also described that 6-23% of subjects without symptoms had full-thickness tears. These studies however, the number of subject was limited and the authors investigated only those without symptoms. There have been few reports describing the prevalence of tear in the general population. There are only few reports by Yamamoto *et al*¹⁴ who conducted a medical check-up for 683 residents of a mountain village investigating the prevalence of symptomatic and asymptomatic rotator cuff tears and reported that rotator cuff tears were present in 20.7% of the subjects. They described that 36% of the subjects with current shoulder symptoms had rotator cuff tears, while 16.5% of the subjects without symptoms also had rotator cuff tears. Our data demonstrated that the prevalence of rotator cuff tear in the general population was 23.5%. This was very close to the prevalence of 20.7% in the previous mass-screening reported by Yamamoto *et al*.¹⁴

In our study the prevalence of tear increased with age. It is interesting to know that the prevalence of asymptomatic tear also increased with age. Thus, we assume that the younger generation is more likely to have symptoms than the older generation. Our data revealed that the very existence of a cuff tear did not always cause shoulder symptoms, especially in the elderly people. Although the prevalence of tear was similar between males and females in their 70s or 80s,

the prevalence in males was significantly greater in the 50s and 60s. Also, in the job category, the prevalence of tear in farmers was greater than that of non-farmers. Thus, overuse of a shoulder joint in male may be one of the causes of rotator cuff tears. However, since our study was a cross sectional study, a further longitudinal study is needed to clarify the causes and natural history of rotator cuff tear.

In our study, the small-sized rotator cuff tear was most commonly seen in the 50s, whereas the large-sized tear accounted for nearly 40% of tear in the 60s or over. This indicates that a cuff tear may appear in a small size in subjects in their 50s and it gradually increases with age. The prevalence of small-sized tear also increased with age, which suggests that a tear may occur at any age and the chances are higher in the elderly people.

LIMITATIONS

This study had several limitations. The average age of the participants was 70 years. The prevalence of tear may have been different if the survey had been conducted in an urban area. Second, farming is the main work in these rural areas and only few other non-farming works. If the survey had been conducted in other areas with different job proportions, the prevalence would have been different. MRI is more preferable than ultrasonography in terms of examining the location and depth of tear in all four rotator cuff tendons. However, it is almost impossible because of the cost-to benefit ratio in the high number screening. In conclusion, our study of 700 participants the prevalence of rotator cuff tear was 23.5% in the subjects, which

increased with age. Asymptomatic tear was twice as common as symptomatic tear.

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