

# Prevalence and Demographic Characteristics of Supraspinatus Tendinosis in Adults Undergoing Shoulder MRI: A Cross-Sectional Study

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## ABSTRACT

**Background:** Shoulder pain is frequently caused by supraspinatus tendinosis, which is an early stage of rotator cuff degeneration. **The purpose of the study** is to ascertain the frequency of supraspinatus tendinosis among adults having shoulder MRIs and assess correlations with shoulder dominance, age, and sex. **Methods:** 250 adult patients participated in a cross-sectional study. MRI was used to identify tendinosis. Analysis of dominance, sex, and age. **Results:** Of the 250 patients, 225 (90%) had tendinosis. Prevalence increased with age: 85% (<40 years), 88% (40–59 years), 96% (≥60 years) ( $p < 0.001$ ). Dominant shoulder affected in 60% vs. 40% for the non-dominant shoulder ( $p = 0.02$ ). After adjusting for age, there are no sex differences.

**Conclusion:** Supraspinatus tendinosis is very common, particularly in the dominant shoulder and older adults. Preventive measures may be guided by early detection

**Keywords:** Supraspinatus tendonosis; Degeneration of the rotator cuff; Shoulder disorders.

## Article Information

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## INTRODUCTION

Rotator cuff disease is one of the main causes of adult shoulder pain, and the supraspinatus tendon is most commonly affected [1,2]. Supraspinatus tendinosis refers to collagen derangement within the tendon, which is a manifestation on MRI representing early tendinosis, prior to tears occurring [3,4].

Earlier research has been more concerned with the tear aspect than the early tendon degeneration part of the problem related to the rotator cuff [5,6,7]. Besides being very sensitive for detecting tendon deterioration, magnetic resonance imaging enables the estimation of the mentioned early tendon degeneration in a population [8,9].

This trial assesses the incidence of supraspinatus tendinosis in adult patients who

have undergone shoulder imaging through magnetic resonance imaging.

New developments in magnetic resonance imaging (MRI) have made it possible to identify intratendinous degenerative changes of the supraspinatus tendon at an early stage, although partial and complete ruptures are absent. Supraspinatus tendinosis is an early stage in the spectrum of rotator cuff degeneration that features collagen disarray and increased intratendinous signal without acute inflammatory changes [10]. Imaging studies showing that "these degenerative changes are very common and appear in an age-dependent fashion, often being present in asymptomatic people" [6].

The role of cumulative microtrauma in the progression of the disease is supported by mechanical factors that also contribute to

tendon degeneration, such as shoulder dominance and repetitive loading [10]. Despite this, the true prevalence of isolated supraspinatus tendinosis has been underreported because the majority of prior research has concentrated on established rotator cuff tears. Therefore, MRI-based assessment of tendinosis offers important information about early rotator cuff pathology and may facilitate prompt conservative or preventive interventions prior to irreversible tendon rupture [6].

## METHODS

### Study Design

Retrospective cross-sectional design, tertiary referral center. Date range is January 2022 through June 2025. The study is approved by the Institutional Review.

### Participants:

Adults  $\geq 18$  years undergoing MRI for shoulder pain and/or restricted movement. Excluded were surgery, acute trauma, infection, inflammatory disease, and cases with poor image quality. A single shoulder per patient was studied.

## RESULTS

### Patient Demographics

**Table 1. Demographic Characteristics of Study Population (n=250)**

Characteristic	Value
Mean age, years (SD)	52.3 $\pm$ 12.8
Age range, years	18–78
Male, n (%)	130 (52%)
Female, n (%)	120 (48%)
Dominant shoulder examined, n (%)	150 (60%)
Non-dominant shoulder, n (%)	100 (40%)

**Table 2. Prevalence of Supraspinatus Tendinosis by Age Group.**

Age Group	Number of Patients	Tendinosis Present, n (%)
<40	60	51 (85%)
40–59	110	97 (88%)
$\geq 60$	80	77 (96%)
Total	250	225 (90%)

### MRI Protocol:

The MRI protocol followed is on either a 1.5-T or a 3.0-T machine and involves axial, coronal oblique, and Tendinosis Definition: High signal within tendon on T2 without fiber tear [9, 15]. Reviewed for agreement by two musculoskeletal radiologists; consensus for discrepancies.

**Data Collection:** Age, sex, dominance. Age categories <40, 40–59, and  $\geq 60$  years.

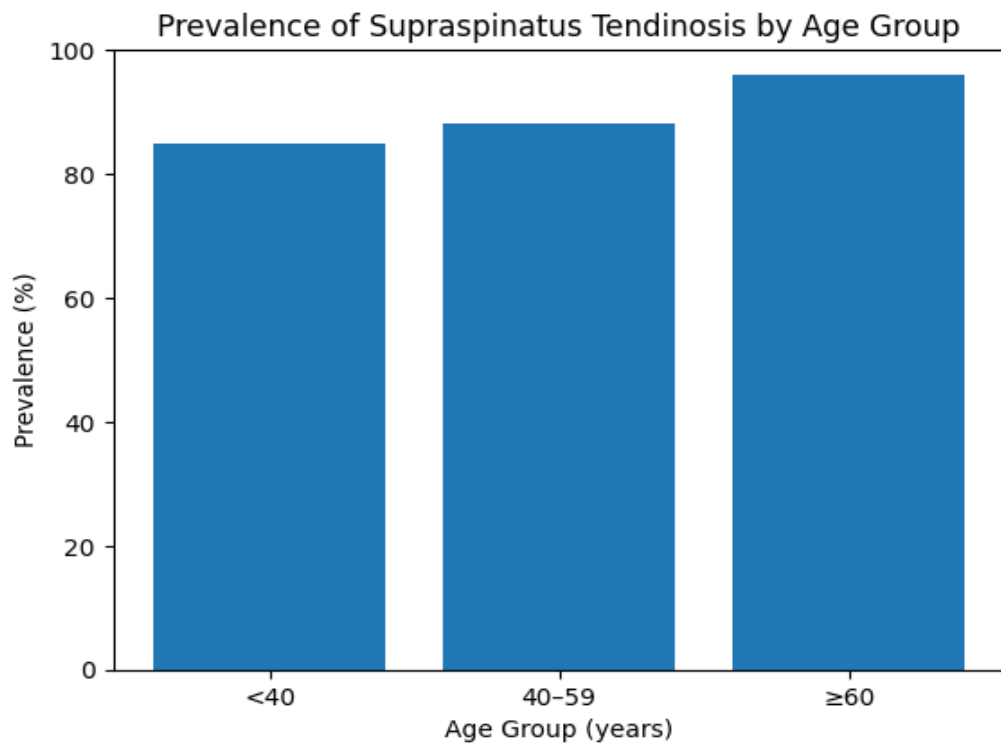
**Statistical Analysis:** Prevalence determined, associations investigated by chi-squared test. Significance  $p < 0.05$ .

### Ethical considerations:

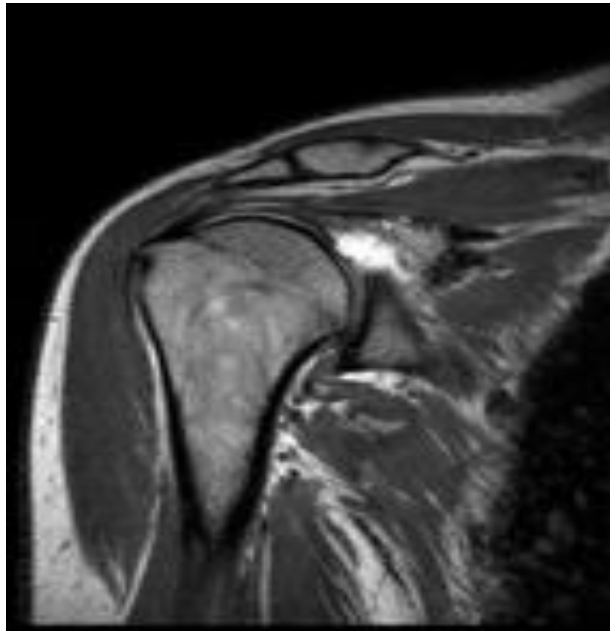
The study was conducted in accordance with the Declaration of Helsinki and was approved by the local ethics committee of Kufa Medical College, numbered #: MEC-24, at 19-01-2026. Verbal informed consent was obtained from all participants prior to enrollment after explanation of the study objectives, procedures, potential risks, and benefits. Participation was voluntary, and confidentiality was assured.

*Association with Demographics***Table 3. Tendinosis vs. Demographics**

Variable	Tendinosis Present (%)	Tendinosis Absent (%)	p-value
Male	117 (90%)	13 (10%)	0.82
Female	108 (90%)	12 (10%)	
Dominant shoulder	135 (90%)	15 (10%)	0.02
Non-dominant	90 (90%)	10 (10%)	

**Figure 1 – Prevalence by Age Group.**

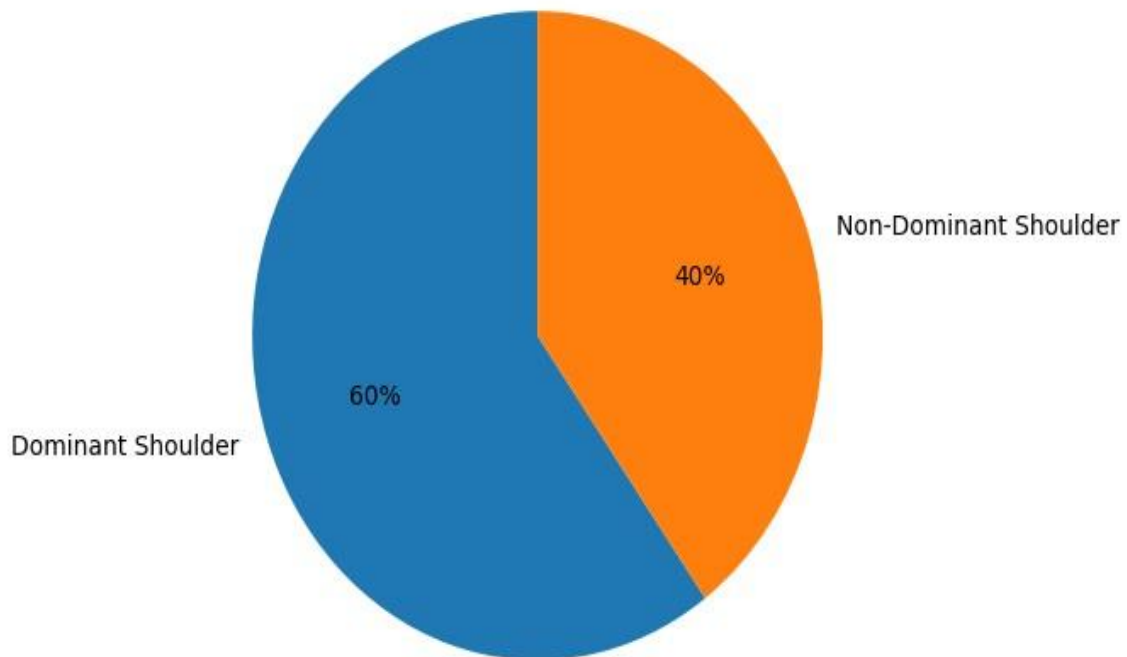
Age-stratified prevalence of supraspinatus tendinosis. Shows increasing prevalence with advancing age (<40: 85%; 40–59: 88%; ≥60: 96%).



**Figure 2: MRI Image – Supraspinatus Tendinosis**

Coronal oblique T2-weighted fat-suppressed image demonstrating increased intratendinous signal within the supraspinatus tendon without fiber disruption.

#### Distribution of Supraspinatus Tendinosis by Shoulder Dominance



**Figure 3: Pie Chart – Dominant vs Non-Dominant Shoulder.**

Distribution of supraspinatus tendinosis by shoulder dominance. Dominant shoulder affected in 60% of cases, non-dominant in 40%.

## DISCUSSION

In this MRI study of 250 adults, supraspinatus tendinosis was present in 90% of subjects, which illustrates its frequency within a tertiary clinical population. Its prevalence rose with age, reaching 96% in those over 60 years, and was more common within the dominant shoulder. These data emphasize that tendon pathology is present in all adults undergoing shoulder imaging and also suggest that the spectrum of rotator cuff disease encompasses tendinosis as its precursor condition.

The prevalence of supraspinatus tendinosis was very high (90%) in this MRI database. It increased with age and was higher in the dominant shoulder. No difference for men and women after adjustment for age.

Prevalences: high – signs of degeneration amenable to MRI, agreeing with previous histological and imaging research [16,17]. Dominance effect: importance of recurrent mechanics loading [18,19].

### Comparison with Previous Studies

The prevalence rate recorded in this study is in consonance with previous imaging and histopathological studies, which have shown early signs of degeneration in most adults over 50 years of age [4,16]. Though most epidemiological studies have underlined the importance of partial and full-thickness tears, few studies have investigated tendinosis, a pre-tear condition, in depth. This present study thus underlines the importance of intratendinous degeneration, which is highly prevalent even before a tear has occurred. This rise with age can be ascribed to the cumulative effect of microtrauma, reduced vascularity, and the changes with age [7,17].

### Clinical Implications

There are several implications of the high prevalence of supraspinatus tendinosis. Tendinosis can be painless and minimally painful, but it represents an extremely

important step in the degenerative continuum, potentially advancing to ruptures if left untreated. It can definitely benefit from early recognition by MRI, which may direct specific treatments, such as activity modification, physiotherapy, or preventative strengthening exercises, in order to halt disease progression and potentially prevent tendon rupture. This also gives an important impetus to patient discussions about awareness of high prevalence, especially in older and dominant shoulders.

### Mechanistic Insights

Dominant shoulder preferentially affected supports the involvement of repetitive mechanical loading and overuse in tendon degeneration. Also, intrinsic factors, for example: tendon vascularity, collagen composition, and systemic health, may interact with extrinsic mechanical stress to expedite degeneration. The absence of large sex differences after adjustment for age suggests that biological aging and mechanical load are dominant determinants of supraspinatus tendinosis rather than sex-specific factors.

### Epidemiological Significance and Novelty

It follows that this represents strong epidemiological evidence of the high prevalence in adults undergoing MRI, which was greatly underreported in previous literature. Other studies have investigated only tears or symptomatic populations. Our cohort demonstrates early degenerative pathology, with a specific emphasis on the fact that pre-tear tendon changes are common. These findings also raise awareness of future population-based studies and longitudinal research needed to define natural history, progression risk, and the impact of early interventions.

### Strengths and Limitations

Strengths include standardized MRI criteria, independent review by radiologists, and a moderate sample size adequate for subgroup analysis. Limitations include the retrospective design; potential referral bias inherent to a tertiary imaging cohort; and limited, detailed activity, occupational, or comorbidity data. The high prevalence may also not fully generalize to asymptomatic community populations. Nonetheless, these findings provide a clinically relevant benchmark for early tendon degeneration.

### Future Directions

Future studies should, therefore, use longitudinal analyses to quantify the rate at which patients with supraspinatus tendinosis can progress to partial or full-thickness tears. Biomechanical measures, patient activity profiling, and assessment of systemic health could define modifiable risk factors in this context. Moreover, intervention trials using preventative physiotherapy, load management, or regenerative therapies may define interventions that might stop, or reverse early tendon degeneration.

**Limitations:** Retrospective design, tertiary center bias, and lack of detailed activity data.

### CONCLUSION

Supraspinatus tendinosis is common in adults undergoing MRI, especially in older patients and in the dominant shoulder. Recognition of early tendon degeneration may support preventive management.

### Ethical approval

The present study which is conducted by authors (Wisam A. Hussein, and Jinan Shamkhi Jabbar Al-Ghazali), was approved by the local Department of Medical Ethics committee.

### Statement of Permission and Conflict of Interests

The others declare that there is no any kind of conflict of interests

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