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Functional outcomes of conservative management in rotator cuff tendinitis in a tertiary hospital in south India

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Abstract

Background: Tendinitis of the rotator cuff and the shoulder impingement are considered to be common intrinsic causes of shoulder pain and disability. They are characterized by pain and painful arc of abduction and signs of impingement. A combination of treatment modalities have been used, physiotherapy such as manual therapy and exercise is often used in the management of rotator cuff diseases. There are only a few studies which throw light on conservative management of rotator cuff tendinitis.

Objectives: To study the functional Outcomes of Conservative Management in Rotator Cuff Tendinitis.

Methods: In the year 2017 to 2018, a total of 53 cases of rotator cuff tendinitis were selected through systematic random sampling and given conservative management. A prospective study of outcome following conservative treatment of 53 patients with rotator cuff tendinitis has been studied. The outcome measures were assessed with clinical improvement in pain, range of movements and SPADI questionnaire. The patients were followed up for a period of 6 months and were evaluated according to clinical improvement in pain, range of movements and with SPADI questionnaire taken before and after conservative management.

Results: In the total pool of 53 patients taken together at a mean follow up of 3.8 months there was mean increase in the range of abduction by 25.8 degrees, adduction by 8.40 degrees, flexion by 20.38 degrees, extension by 7.83 degrees, external rotation by 16.89 degrees and internal rotation by 17.55 degrees. The SPADI functional outcome measurement showed decrease in pain % by 13.08%, disability by 11.95% and total SPADI 11.43%. With an overall percentage of improvement being 73.58% of the total group.

Conclusion: The results of our study re-enforces the fact that conservative management is optimal in the management of Rotator Cuff Tendinitis. A combination of Short course NSAIDS and 3 phase physiotherapy has been found effective in management of the condition.

Keywords: Rotator cuff tendinitis, conservative management

Introduction

Rotator cuff is one of the main structures essential for static and dynamic stability as well as mobility of the shoulder joint. In 1972 Charles Neer^[1] introduced the concept of impingement syndrome as a continuum from bursitis to tear. He also classified rotator cuff lesions into three stages: stage 1, odema and haemorrhage; always responded to non-operative care; stage 2, tendinitis and fibrosis (impingement syndrome) occasionally required subacromial decompression and stage 3, partial and complete tendon tears, for which operation to repair the tendon was indicated. Tendinitis of the rotator cuff and the shoulder impingement are considered to be common intrinsic causes of shoulder pain and disability^[2]. Tendinitis is thought to be microtearing of the tendon which results in healing and microscarring of the tendon. This healing process may occur normally with rest from aggravating factors. The exercise performed during this healing phase must encourage collagen synthesis without irritating^[4]. Ultrasonography is an effective imaging modality in the evaluation of rotator cuff disorders^[9]. Several studies have shown an accuracy for US detection of rotator cuff lesions compared with surgical findings of greater than 0.85^[11] and an inter observer reliability of 0.63^[12]. A combination of treatment modalities have been used, physiotherapy such as manual

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therapy and exercise is often used in the management of rotator cuff diseases [3]. Ultrasound is believed to differ from superficial heating modalities by heating deeper tissues when applied with appropriate intensity and frequency. Non thermal effects are claimed to promote healing, although this has not been proven with *in vivo* studies [13]. According to the surveys, the use of ultrasound is to decrease soft tissue inflammation, increase tissue extensibility, enhance scar tissue remodelling, increase soft tissue healing, decrease pain and decrease soft tissue swelling [13].

Materials and Methods

Materials

The study was a hospital based prospective study conducted in tertiary center in south India from June 2017 to may2018.53 patients with age above 18 years diagnosed clinically and ultrasonographically with Rotator cuff tendinitis, underwent the conservative management protocol with NSAIDS and physiotherapeutic modalities. The

functional outcome was studied during follow up at 3 months and 6 months.

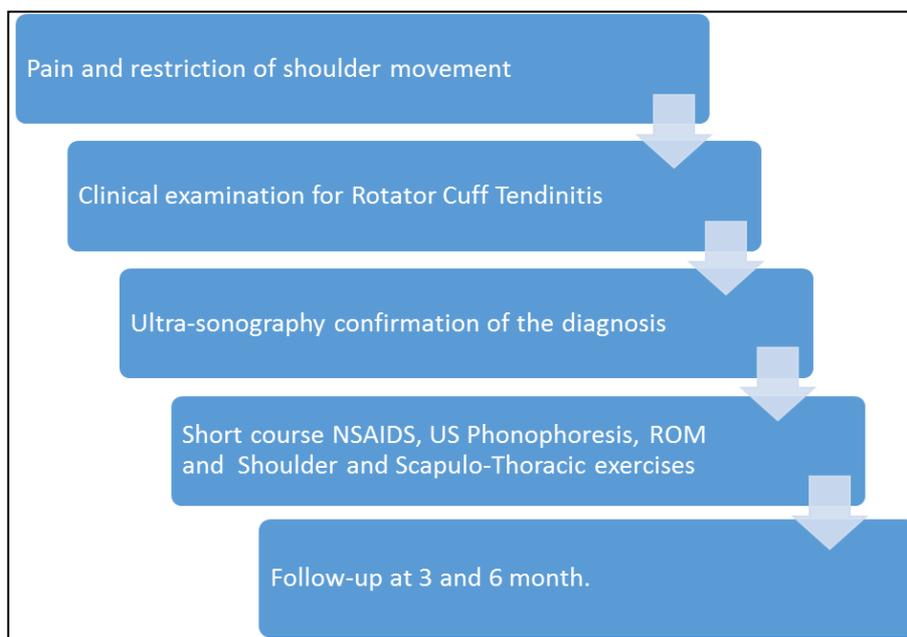
Inclusion Criteria

1. The patients above 18 years of age diagnosed clinically and ultrasonographically with Rotator cuff tendinitis.
2. Treated by conservative management protocol with NSAIDS and physiotherapeutic modalities.
3. Patients who would be available for follow up for minimum of 6 months.

Exclusion Criteria

1. Patients below 18 years.
2. Patients with previous shoulder surgery.
3. Patients with history of nerve blocks to the shoulder.
4. Patients with intra-articular injections.

Methods



Examination

Three clinical tests (Neer's, Hawkins's, and Yocum's) were used to detect shoulder impingement syndrome. Four manoeuvres for determining the location of the tendon lesion, Jobe's test for supraspinatus, Patte's test for infraspinatus and teres minor, Gerber's lift off test and resisted internal rotation assessment for subscapularis, were performed [5-8]. Clinical diagnosis was established by the positivity of the tests. The clinical ranges of motion of both the shoulders were measured using a goniometer.

Musculoskeletal Ultrasonography [9]

All patients were examined with commercially available real time equipment using a 7.5 MHz (Toshiba, Xario, Japan) linear phased array transducer. High resolution imaging afforded by the current generation of high frequency (greater than 7.5 MHz) linear transducers allows us to effectively assess superficial tendon and muscle lesions and bursitis. In all patients, comparable images of the opposite shoulder were obtained in order to compare ultrasound findings.

Table 1: Ultrasonographic findings in Rotator Cuff pathology

Shoulder Abnormality	Ultrasonographic findings
Rotator cuff tendinitis	Tendon hypoechogenicity or tendon thickening with or without internal hypo or hyperechoic foci
Rotator cuff calcifications	Hyperreflective foci or lines with acoustic shadowing
Rotator cuff impingement	A buckling of the cuff/rippling effect as the cuff passes beneath the coracoacromial arch or fluid distending the subacromial-subdeltoid bursa or thickened bursa in front of the acromion while the arm is abducted

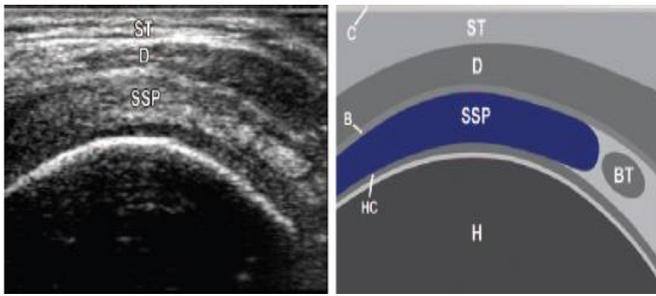


Fig 1: Ultrasonographic view of the Rotator Cuff

patients were started on short course of analgesics and started on US therapy and physical therapy and followed up at 3 and 6 months.

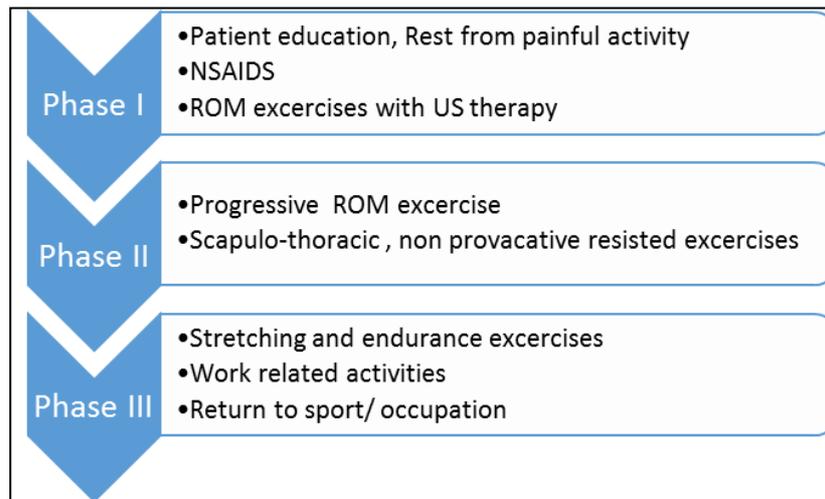
Ultrasound Therapy

All patients underwent ultrasound therapy. Machine Settings: Intensity=0.8W/cm² for a duration 8 minutes. The frequency used was 3 MHz with pulsed mode of 1:4. 38 was used in our study.

Physical therapy protocol

Management

Once the diagnosis of Rotator cuff Tendinitis was confirmed,

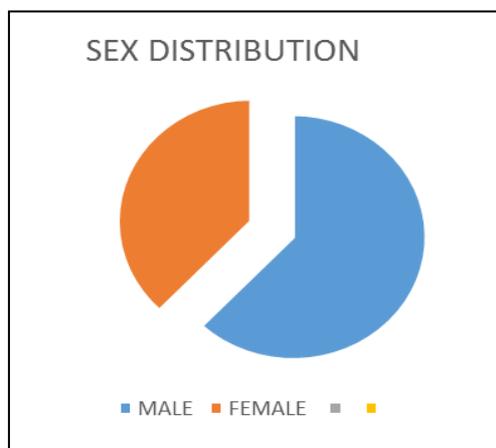


Patients were put on a short course of analgesics (NSAIDs) and on a 3 phase rehabilitation program which included simultaneous pain management and assigned low graded exercise therapy and then stepped to high grade exercise therapy over a period of 7 days. Patients were followed up after 3 months and at 6 months.

The outcome measures following the therapy were measured in terms of improvement in range of motion and SPADI questionnaire.

Results

Age and sex distribution (Fig2)



In our study we found that, there was a malprepondance and male represented 62.26% of the sample. There were a total of 37 patients in the 40-60 age group. The study revealed that the dominant hand was more involved which was right in a

majority of the cases and it accounted for 58.5%. Majority of the patients in the current study had complaints of shoulder pain and gradual restriction of mobility for a period less than 6 months. The outcome measures following the therapy were measured in terms of improvement in range of motion and SPADI questionnaire.

Range Of Movements

The pre and post treatment showed significant improvement with an improvement of difference percentage by 37.36% and a highly significant p value. The pre-treatment mean was 67.92 degree and it had improved to 93.30 post treatment. The t value was 9.99.

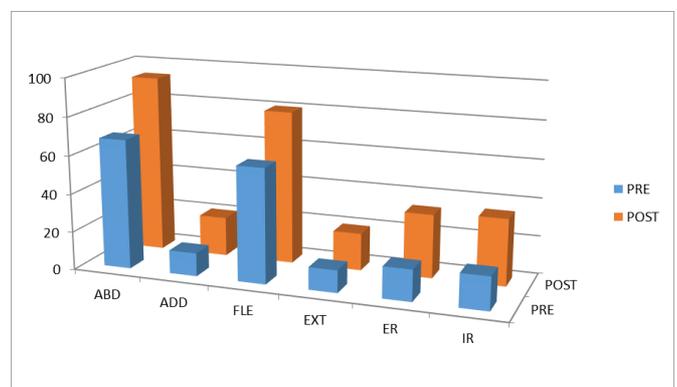


Fig 3: ABD- abduction, ADD- adduction, FLE- flexion, EXT- extension, ER- external rotation and IR- internal rotation

Spadi Questionnaire Outcome

In our study there was a significant mean difference of 9.21 and difference percentage 11.43. The mean value was at 80.60

at presentation and had dropped to 71.39. the p value was highly significant. The pain percentage had decreased by 10.77 and difference percentage of 13.80%. with a highly significant p value. The initial mean value at presentation was 78.06 and the value had reduced to 67.28 at the end of the

treatment. The disability score had come down by a percentage of 11.95 and a mean difference 9.74. the p value being highly significant. The initial mean value at presentation was 81.58 and post treatment the value had come down to 71.84.

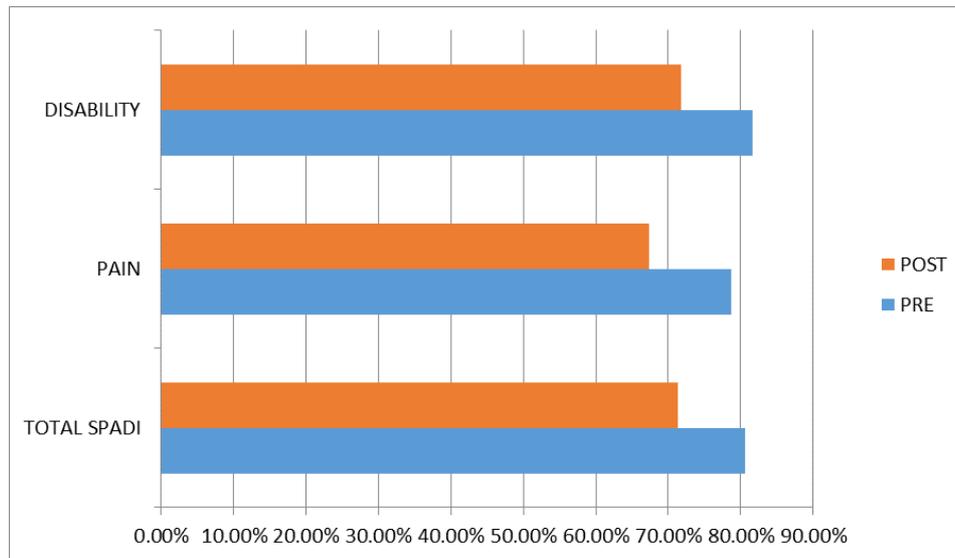


Fig 4: SPADI (shoulder disability and Pain Index) questionnaire pre and post treatment results expressed as percentage. All three outcome measures were highly significant with improvement.

Observations and Discussion

Trivial trauma during daily activities accounted for nearly eighty percent of injuries, remaining were trauma due to fall and insidious onset due to degeneration. In our study of the 53 patients 30 were male and 23 were females indicating a male preponderance which is in correspondence with the study by Lehman and associates. In our study Right side was involved in 58.5% and Left in 41.5% with right side more commonly involved which was the dominant hand, is in correspondence with the study by Chard *et al.* Out of the 53 patients diagnosed of rotator cuff tendinitis thirty four had supraspinatus involvement, ten had subscapularis, two had teres minor and three had infraspinatus involvement. Therefore it can be stated that supraspinatus is the most commonly involved tendon in rotator cuff injuries which is on par with Frederick A Masten III *et al.* study.

In our study the patient's age group was mainly in the productive compartment of 30-60 years of age group accounting for forty seven of the fifty three patients (88.7%). This was in agreement with the literature studies [18].

The duration of symptoms ranged from 4-6 months in a majority, thirty four patients (64.2%) of the total 53 were in the 4-6month age group. In our study, the most important parameter in the assessment was the range of abduction considering that supraspinatus is the most common tendon involved. The pre and post treatment showed significant improvement with an improvement of difference percentage by 37.36% and a highly significant p value, which agrees with the other studies [18, 19]. The study by Karen *et al.* showed an overall 22 degree increase in the Abduction in our study the improvement was 25.8degree. The improvement signified that such movement is considerably compromised in the shoulder injuries and can be improved with conservative management. In our study the flexion had improved by a mean difference off 20.38 and statistically significant p value. The results in our study are better than the study by Karen *et al.* which had total mean increase by 16 degrees. Extension had improved by difference of 7.83degree and difference % of 66.94% and a

highly statistically significant p value. Rotations- external rotation had improved by diff % of 102.87 and internal rotation by 101.90%.

In the SPADI score outcome assessment of the 53 patients 39 patients had improved by a 10% margin 14 had a cut off that ranged between 7-9%. Percentage of improvement being 73.58% of the total group.

In the total pool of 53 patients taken together at a mean follow up of 3.8 months there was a decrease in pain % by 13.08%, disability by 11.95% and total SPADI 11.43%. The p value being highly significant in all the three outcome measures. Off the 53 patients 1 had progressed from tendinitis to partial tear and 1 had a complete tear for which he underwent arthroscopic repair.

From our study we conclude that there enough evidence that the patients had improved following a short course NSAID and Physiotherapy (low and high grade). Our results demonstrate that there was a statistically significant improvement in pain and disability of the patients.

Limitations

1. Methodological limitations of diagnostic accuracy of USG
2. Short term follow up.
A large sample with a double blind study and longer follow-up can be more conclusive. And MRI as a diagnostic tool will help increase the accuracy and avoid the inter observer variability

Conclusion

It affects the productive age group and should be addressed as early as possible.

The results of our study re-inforce the fact that conservative management is optimal for the management of rotator cuff tendinitis.

A combination of Short course NSAIDS and 3 phase physiotherapy is effective in management of the condition.

Summary

- This study was done to “Functional Outcomes of Conservative Management in Rotator Cuff Tendinitis ”
- 53 patients with age above 18 years diagnosed clinically and ultrasonographically with Rotator cuff tendinitis were selected by systematic random sampling and they underwent the conservative management protocol with NSAIDS and physiotherapeutic modalities.
- We had patients above 18 years and majority were males.
- The were measured in terms of improvement in range of motion and SPADI questionnaire before and after conservative management were tabulated and statistically analyzed.
- A combination of Short course NSAIDS and 3 phase physiotherapy is effective in management of the condition.

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