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# Prevalence Of De Quervain's Tenosynovitis In Professional Mehendi Artists In Pune: An Observational Study

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## Abstract

**Background:** De Quervain's Tenosynovitis is a painful condition involving inflammation of the tendon sheath of the abductor pollicis longus and extensor pollicis brevis tendons and is commonly associated with repetitive thumb and wrist movements.

**Objective**: To determine the prevalence of De Quervains Tenosynovitis among professional mehendi artists in Pune**.**

**Methodology:** An observational study was conducted on 110 professional mehendi artists aged 20-40 years using convenient sampling Finkelstein's test was used to assess the presence of De Quervain's Tenosynovitis .Descriptive statistics were used for data analysis.

**Result:** The prevalence of De Quervain's Tenosynovitis was found to be 68.2%. Females constituted 59% of the study population**.**

**Conclusion**: The study reveals a high prevalence of De Quervain's Tenosynovitis among professional mehendi artists, highlighting the need for preventive strategies and early physiotherapeutic intervention.

## Keywords

De Quervain's Tenosynovitis ; Mehendi Artists ; Prevalence; Finkelstein Test, Occupational Health

## Introduction

De Quervain's Tenosynovitis is a disease in which there is pain and swelling over the radial styloid process.There is an inflammation of common sheath of abductor pollicis longus and extensor pollicis brevis tendons .There is tenderness over radial styloid process[. The origin of abductor pollicis longus is ulna ,radius ,interosseous membrane and the action of it is abduction and extension of thumb ,the origin of extensor pollicis brevis is radius and interosseous membrane and action of extensor pollicis brevis is extension of the thumb.[2] pain is aggravated by adducting the thumb across the palm and forcing ulnar deviation and on asking patient to perform radial deviation against resistance. There may be palpable thickening of sheath .[3]The pain radiates proximal to distal from the first dorsal wrist compartment. The confirmation of De Quervain's Tenosynovitis is done by positive findings on Finkelstein test [3].

De Quervain's Tenosynovitis is a disease known for resulting from trauma due to chronic overuse, which is common cause of hand pain.[4]. When force is applied repeatedly over a prolonged period to the muscle group, joint or tendon, cumulative forces may cause soft tissue micro-tears and trauma.[4] The resulting injury and inflammation response may lead to tendon and synovial disorders, muscle tear, ligamentous disorders, degenerative joint disease or nerve entrapment.

Mehendi application require precision thumb movements ,fine pinching and wrist deviation ,often repeated hundreds of times during long working hours. These repetitive motions cause friction between tendons and tendon sheath ,leading to micro-trauma ,inflammation ,and pain.[6] Chronic upper-limb musculoskeletal disorders ,also known as repetitive strain injuries or cumulative trauma disorders ,create many challenges, to diagnose and treat them, to establish their relationship in activity and in case of work related disorders ,to create work environments that minimize their occurrence.

Work related musculoskeletal disorders have been attributed to jobs that are repetitive, forceful or require awkward postures.[4,6] The cumulative effect of prolonged exposure significantly increases the risk of De Quervain's Tenosynovitis.[7,8] Many Mehendi artists work continuously for 4-10 hours of the day without adequate rest .Continuous mechanical load prevents tendon recovery , allowing micro-injuries to accumulate over time.

Diagnosis is usually concluded by a positive Finkelstein's test (which causes are production of pain at the radial styloid ),as well as the presence of a tender nodule over a radial styloid. It is a most standard finding. A positive test is indicated by pain over the abductor pollicis longus and extensor pollicis brevis tendons at the wrist and is indicative of paratendonitis of these two tendons [11]

## NEED OF STUDY

De Quervain's Tenosynovitis is associated with occupation which includes overuse of wrist and thumb. It is also associated with repetitive trauma. Mehendi artists require long period of working hours and sustained awkward wrist posture as well as repetitive movement of wrist and thumb. This sustained work position makes them prone for development of musculoskeletal disorders related to wrist and hand.

Mehendi artists involves more movement of thumb while using mehendi cone and pressing cone by thumb to come mehendi forward, this working pattern leads to pain and discomfort at wrist and hand which indirectly affect their quality of life resulting in discontinuation of their professional practice which may cause economical burden in this population. Hence, this study aims to find prevalence of De Quervain's Tenosynovitis in professional mehendi artists..Also ,no study has been done on prevalence of De Quervain's Tenosynovitis in professional mehendi artists till now.

## AIM

To study the prevalence of De Quervain's Tenosynovitis in professional Mehendi artists

## OBJECTIVE

To determine presence of De Quervain's Tenosynovitis in professional Mehendi artists using Finkelstein test .

## METHODOLOGY

Study Design- An observational study

Study setting –In and around the Pune

Study Sample –Convenient sampling

Sample size – 110

Study population –Mehendi Artists

Study duration -6 months

## CRITERIA

### Inclusion Criteria

Participants who are willing to participate .

Age group between 20-40 years .

Participants who have been working as Mehendi artist for more than 5 years.

Both male and female are included.

Working hours 5-8 hours per day.

The hand which is used for Mehendi Application.

### Exclusion Criteria

Participants with fracture around forearm ,wrist and fingers .

Participants with a history of musculoskeletal disorders of wrist and hand.

Inflammatory disorders of hand or wrist.

Any acute injury or trauma.

Any skin diseases.

## MATERIALS

Pen

Finkelstein's Test

Consent form

Data collection Sheet

## OUTCOME MEASURE

### Finkelstein test

The participant seated opposite the examiner with their forearm on the table The forearm positioned flat on the table with hand hanging over the edge and side facing down .

The patient is asked to place his thumb in the palm of the hand and flex the digit around the thumb .The examiner applied ulnar deviation to create tension in first dorsal compartment.

A positive result is pain in the first dorsal compartment.

### Procedure

Subject were selected according to the inclusion and exclusion criteria. A written informed consent was taken from the subjects .The subjects were explained about the procedure.

Then the Finkelstein test was performed as follows : Patient was asked to sit on chair with forearm supported in mid-prone .Therapist was sitting on opposite side of patient .The patient was asked to make a fist with the thumb inside the fingers.The examiner then stabilized the forearm and deviated the wrist towards ulnar side. The test is performed on both hands.

A positive test is indicated by pain over the abductor pollicis longus and extensor pollicis brevis tendon at wrist and is indicative of a De Quervain's Tenosynovitis .The data was collected and was statistically analysed

### Data and Statistical Analysis

### Descriptive Statistics for age, hours of work per day, and years of work experience

Age of the participants ranged from 20 to 40 years with mean: 29.63 $\pm$ 5.75 years, and median = 28; hours of work per day ranged from 5 to 8 hours with mean: 6.15 $\pm$ 1.45 hours, and median = 6; and the work experience ranged from 6 to 25 years with mean: 9.91 $\pm$ 4.29 years, and median = 8.

### Gender Distribution

| | | No. of Population | % |
|---|---|---|---|
| Gender | Male | 45 | 40.9 % |
| | Female | 65 | 59 % |

Among the 110 participants; the majority were Female (59%); and the 40.9%were male.

Hence , mehendi artists are predominantly female oriented.

**Prevalence of De Quervain's Tenosynovitis**

The Finkelstein test was found to be positive among 68.2% of the cases; and it was negative among 31.8%.

| Prevalence of DQT | | |
|---|---|---|
| Finkelstein test | n | % |
| Positive | 75 | 68.2 % |
| Negative | 35 | 31.8 % |

**Result**

Study included 110 Mehendi artists (20-40 yr) with mean age 29.63 ±5.75 yr ; Mean of working hours per day 6.15 ± 1.45 hours and Mean of work experience 9.91 ± 4.29 years.

Among the participants ,59% were female and 40.9% were male ,including that mehendi artists are predominantly female oriented.

Using the Finkelstein's Test ,the prevalence of DQT found to be positive in 68.2% of participants and negative in 31.8% of the participants .Thus ,the overall prevalence of DQT can be estimated at approximately 68.2% indicating a significant burden among this occupational group.

**Discussion**

The current study aimed to diagnose the prevalence of De Quervain's Tenosynovitis in 110 Professional Mehendi Artists in age group of 20-40. The prevalence was studied using finkelstein's test which is an active test commonly used to detect presence of De Quervain's Tenosynovitis, wherein subject makes a fist with the thumb inside the fingers and then deviates wrist towards the ulnar side. This aggravates the Abductor pollicis longus and Extensor pollicis brevis tendons. On performance of the test, it was found that 68.2 % of the population had positive finkelstein's test and 11.8% had negative finkelstein's test.

A study conducted by Priyal Boricha suggested that professional mehendi artists suffer most from work related musculoskeletal disorders in the neck, shoulder ,hand and wrist.[1] The study conducted by Jamro et al defined work related musculoskeletal disorders as soft tissue disorders, cumulative trauma disorders, repetitive strain and motion injuries and concluded that the main complaint of professional mehendi artists were pain ,swelling and muscular weakness due to overuse activities and extreme work hours.

De Quervain's Tenosynovitis is a disease known to be caused due highly repetitive tasks involving repeated or sustained wrist bending for prolonged period of time. such strenuous task led to musculoskeletal disorders in 58 % of Mehendi artists assessed by the SF 32 scale in the study done by Priyal Boricha in Nov.2023[1]

The repetitive biomechanics involved in mehendi application –such as constant pinching grip ,prolonged thumb abduction ,ulnar and radial deviation of the wrist and sustained fine motor control create continuous mechanical stress on abductor pollicis longus and extensor pollicis brevis tendons . Over the year of work and long daily hours , these movements lead to overuse ,tendon irritation and inflammation within the first dorsal compartment, which explains the high rate of positive cases identified in the study. [3]

Since forearm and hand disorders have long been overlooked to give importance to neck/shoulder disorders ,this warranted a need for a study which indicates definitive prevalence of De Quervain's Tenosynovitis in professional mehendi artists .This study was conducted notion that most of the daily activities involved in mehendi artist's occupational hours constitute of extensive use of forearm,wrist,hand, fingers .[4]

Hence,it is very possible to assume that there is a relationship between the occurrences of De Quervain's Tenosynovitis and the nature of work that professional mehendi artist performs on regular basis. This assumption was proved by the 75 % overall positive results ,which clearly establishes the need for a simple treatment protocol that can be easily followed by the mehendi artists ,as well as ergonomic advice that not only focuses on posture and long sitting hours ,but also on care for wrist and hand activities and positions. [5,7]

The study also showed a gender distribution of 59% female and 49.9% males with female demonstrating a gender proportion of positive cases.This findings aligns with previously reported trends indicating that females may be more susceptible to tendon-related disorders due to anatomical factors,hormonal influences and often higher cumulative hand use demands both professionally and domestically.[9]

Stahl S et al. BMC Musculoskeletal Disorders 2015 and Wolf JM et al. 2009 confirm higher prevalence among females especially in their 30s-50s [17].Women often have smaller wrist compartments and relatively larger tendon cross -sections, increasing crowding and mechanical irritation.(Stahl S et al 2015)[12]

Women mehendi artists often work continuously without rest, and some combine this with household or childcare duties that also involve repetitive lifting and grasping . oestrogen and relaxin harmones influence ligament and tendon laxity .These hormones are higher during reproductive years and pregnancy , causing soft tissue swelling and reduced tendon stiffness ,making tendons more vulnerable to friction within the narrow fibro-osseous tunnel of the first dorsal compartment. Male have larger tendon sheath area and stronger connective tissues ,so the tendon glides more easily with less friction. Higher muscle strength and tendon stiffness can distribute mechanical load more evenly, reducing micro-trauma [18].Hence females are more prone to De Quervain's Tenosynovitis than males.

The findings contribute valuable baseline data that can be used for larger studies and targated health programmes for professional mehendi artists . Overall, the a study not only highlights the substantial prevalence of De Quervain's Tenosynovitis nut also underscores the importance of recognizing mehendi artistry as a high-risk occupation requiring focused preventive rehabilitative attention.

## Conclusion

From the above study and results, it is concluded that the prevalence of De Quervain's Tenosynovitis (DQT) is highly prevalent among professional mehendi artists in Pune ,with 68.2% testing positive using Finkelstein's test.

## Limitation

The study did not include detailed analysis of working posture ,wrist angles ,or ergonomic tools used ,which might have influenced the development of De Quervain's tenosynovitis.

## Future Scope

Future studies evaluate the effectiveness of preventive strategies such as thumb/wrist exercises ,ergonomic modifications ,rest breaks or splints usage ,in reducing DQT prevalence among high risk worker.

Comparing mehendi artists with other hand intensive occupation (tailors, hairdressers , musicians) can help identify occupation specific risk factors and universal preventive measures for DQT.

## Clinical Implication

As we know now that there is high risk of hand dysfunction because of repetitive movement, force, pressure and sustained awkward posture while Mehendi application ,we can use our study prevent occurrence or worsening of existing De Quervain's Tenosynovitis. People can be taking frequent breaks while working and resting the hand. People already experiencing pain and discomfort can be given braces to immobilise the thumb and wrist. Ultrasound therapy is known to be beneficial in cases of De Quervain's Tenosynovitis. Ice application may help in some cases.

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