A STUDY TO FIND OUT FREQUENCY OF DE QUERVAIN'S TENOSYNOVITIS IN MOBILE USERS - AN OBSERVATIONAL STUDY

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ABSTRACT

Background: Thumbs are commonly used for text messaging scrolling, which are not as well designed for fine manipulative or dexterous work. Repetitive use as in text messaging, scrolling can lead to the injury to the tendons of the thumb. The aim of study is to investigate the frequency of De Quervain's tenosynovitis and its association with mobile use more than one year.

Method: Sample size was 100 students which were selected through convenience sampling. Data was collected according to inclusion criteria and De Quervain's tenosynovitis was diagnosed through Finkelstein test. The participants were instructed to make a fist with the thumb enfolded inside the fingers. The examiner stabilized the forearm and passively ulnar deviated the wrist. Pain at the radial wrist over the Abductor pollicis longus and Extensor pollicis brevis tendons, a positive test indicated. The data was analyzed by SPSS version 20 and Chi-square was applied to analyze the data.

Result: Male/ female ratio was 1:3 all student were using regular touch screen cell phone. Out of 100 student 70 student having pain in thumb & wrist for this student finkelstein test shows positive result. There is significant positive correlation between mobile users and de quervain's tenosynovitis ($p < 0.05$).

Conclusion: The result of the study concluded that almost half of the students use their mobile phones for texting more than 1year & 1 hours per day and because of their high speed of texting, scrolling they experienced pain over the base of the thumb/wrist which shows the De Quervain's positive in that student and there is a positive association between the thumb pain and frequent text messaging and scrolling.

KEYWORDS: De quervain's tenosynovitis; Mobile use; Finkelstein test.

INTRODUCTION

Fritz De Quervain was the first in 1895, who defined De Quervain's tenosynovitis (DQ) as a painful complain of the wrist as stenosing tenosynovitis of thumb abductors around the radiostyloid process[1].

The literature review reveals the precise etiology of De Quervain's tenosynovitis which includes an acute trauma or an extreme, unaccustomed/new exercise. However, more commonly it may be the result of cumulative micro trauma. Thus, adults who use their hands and thumb in repetitive manner are more likely to have De Quervain[1].

Tendons are rope like structure that attaches muscle to bone. Tendons are covered by slippery thin soft tissue layer, called synovium. This layer allows the tendons to slide easily through a fibrous tunnel called a sheath. Any swelling of the tendons or thickening of the sheath, results in increased friction & pain.

De Quervain's tenosynovitis predominantly impacts the abductor pollicis longus (APL) and the extensor pollicis brevis (EPB) tendons, which pass through the first dorsal compartment of the wrist. The etiology of this disease is due to repetitive and continued strain of the APL and EPB tendons as they pass under a thickened and swollen extensor retinaculum[2].

This pain is exacerbated by motion and activity requiring ulnar deviation with a clenched fist and thumb metacarpophalangeal (MP) joint flexion. Specific activities that may incite complaints include wringing a washcloth, gripping a golf club, lifting a child, or hammering a nail. Inflammation is increased with continued performance of these or similar functional activities[2].

The patients may experience the associated symptoms beside the pain is dysesthesias, such as numbness, tingling, burning, and cramping.

Mobile phone users are at risk of developing various repetitive strain injuries (RSI) type of conditions to the soft tissues due to repetitive use of the phone in text messaging, scrolling. Musculoskeletal problems of the upper limb and especially the thumb has been reported in mobile phone users due to text messaging, scrolling[3].

Text messaging, scrolling is the common term for sending short text messages using the short message from mobile phones. With the new occupational and professional demands the prevalence of this condition is also increasing gradually[4].

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The most standard finding in De Quervain's tenosynovitis is a positive Finkelstein test.

OBJECTIVE & AIM OF STUDY

To find out the frequency of de quervain's tenosynovitis in mobile phone users.

HYPOTHESIS OF STUDY

Null hypothesis: There is no significant correlation between frequency of de quervain's tenosynovitis and use of mobile phone.

Alternative hypothesis: There is significant between correlation frequency of de quervain's tenosynovitis and use of mobile phone.

METHOD

An observational study design with 100 students.

Inclusion criteria

- Age between 18 to 25 years
- Both male & female
- Daily one hours of mobile use since one year with one hand for messaging play game or searching.

Exclusion criteria

- Upper limb pathology
- Upper limb fracture
- Phone used with two hand
- Daily phone use is > one hours.

MATERIAL

- Paper
- Pen
- Record data collection sheet
- Consent form

PROCEDURE

Individually informed consent was taken from all the 100 students selected for the study on the basis of inclusion and exclusion criteria. Also including information such as type of mobile phone used by the students for text, hours of mobile phone use for texting, playing game & searching. The participants were instructed to make a fist with the thumb enfolded inside the fingers. The examiner stabilized the forearm and passively deviated the wrist. Pain at the radial wrist, over the Abductor pollicis longus and Extensor pollicis brevis tendons, a positive test indicated. When it is significantly more tender than the other side.

Data entry and analysis were done using computer software SPSS version 20. Frequency and percentages were taken for categorical variable. Chi-square was applied to determine association between different variables and Finkelstein test. P value < 0.05 was considered significant.

RESULTS

Out of the total number of students who participated in the study 79 were females and remaining 21 were males with a male to female ratio of 1:3 respectively. In out of 79 females students 17 and out of 21 males students. Table 1.1 showed Descriptive Statistics.

Finkelstein test when done on students almost more than half (n=73) showed positive results. It was noted that as frequency of mobile phone usage increased progressively more and more people showed positive Finkelstein test. P value showed P= 0.00 which show highly significant correlation between de quervain's tenosynovitis and mobile phone user.

Table 1: Descriptive Statistics

	N	Mean	SD	Min	Max
Test	100	.8200	1.12	.00	11.0

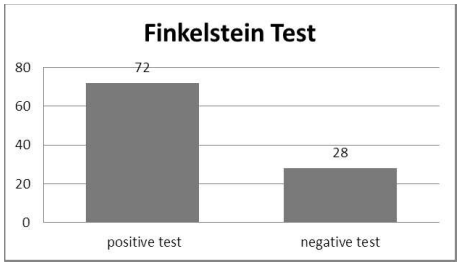
Table 2: Chi –Square Test

	Observed N	Expected N	Residual
Negative	28	50	-22
Positive	72	50	22
Total	100		

Table 3: Test Statistics

	Test
Chi-Square	19.360[a]
Df	1
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 50.0



Graph 1: Results of Finkelstein Test

DISCUSSION

Finding of this study suggest that there is high correlation between de quervain's tenosynovitis and duration of mobile phone use.

Younger peer group access and exposure to different types of information and communication equipment such as computers and mobile phones has intensely increased over recent years[6]. During the past decade in Sweden only,

15-24-year-age group have 100% access to mobile phones and 93% on average utilize it for sending text messages (SMS), play game[7]. Use of mobile phones has increased in USA in teens for text messaging from 38% in 2008 to 54% in 2009[8].

When considering students related to healthcare profession most common reasons related to SMS texting include academic related activities. De Quervain's tenosynovitis most commonly arises due to the overuse of the thumb musculature which is characterized by pain that spread over the surface of radial aspect of the wrist and intensified by ulnar deviation of the hand[9]. An extensive community based study performed in United Kingdom displayed that prevalence of de Quervain's tenosynovitis was 0.5% in males compared to 1.3% in females[10].

In 2007, The New Zealand Medical Journal published an article on texting tenosynovitis where they figured two previous reports of texting tenosynovitis[11].

A variety of mobile phones were used by participants differing in size and weight that may have produced varied results. Also posture while texting was never noted. Studies have stated difference of results for those messaging while standing compared to sitting as it creates a different impact on the muscles of upper limb, with more exertion on muscles while standing during messaging[12].

In the 21st century mobile phones have become more of a necessity than a luxury. With the dawn of smart phones and advance versions expected in future it is inevitable that diseases related to extensive use of cell phones will increase in numbers specifically musculoskeletal problems. The main brunt will be faced by the younger generation who are still in the phase of development and are prone to extensive use through short message service (SMS) messaging. In the 21st century mobile phones have become more of a necessity than a luxury[13].

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The main brunt will be faced by the younger generation who are still in the phase of development and are prone to extensive use through short message service (SMS) messaging and gaming. In order to inhibit the development of musculoskeletal disorders, a better understanding of the texting technique and connection to the muscle activity and the kinematics is needed[15].

As De Quervain's tenosynovitis is a serious issue leading to dysfunction of the affected hand further insight would help researchers to get a background for physical guidelines for texting on mobile phones and recommend appropriate behavioral changes for averting this under recognized cause of tendinopathy. Limitation is overcome by further recommendation.

CONCLUSION

The result of this study concluded that almost half of the students use their mobile phones for texting more than 50 SMS per day and because of their high speed of texting they experienced pain and weakness over the base of the thumb/wrist which shows the more chances of De Quervain's tendinopathy.

CLINICAL IMPLICATION

This research will advise mobile phone users to text with both hands, take frequent breaks, not type too fast and to give proper support to their forearms and back while texting.

LIMITATION

- Small sample size
- Size of mobile phone screen
- Size of thumb
- 1st web space of hand

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