Prevalence of De-Quervain's Tenosynovitis Among Medical Professionals

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Abstract

Background: De-Quervain's tenosynovitis is a condition that involves tendon entrapment, affecting the first dorsal compartment of the wrist. While the exact cause of De-Quervain's tenosynovitis is unclear, it is associated with repetitive wrist motion, specifically motion requiring thumb radial abduction and simultaneous extension and radial wrist deviation. The purpose of the study is to determine the prevalence of De-Quervain's tenosynovitis and its relationship to the frequency of cell phone usage among medical professionals.

Objective: The purpose of the study was to determine the prevalence of De-Quervain's tenosynovitis and its relationship to the frequency of cell phone usage among medical professionals.

Methodology: A cross-sectional survey was conducted among medical professionals in the Makkah region. Participant sample size was 354 students, selected through convenience sampling. Data was collected from medical professionals through a self-administered questionnaire and the severity of pain was assessed through the Universal Pain Assessment Tool. De-Quervain's tenosynovitis was diagnosed through the Finkelstein test.

Result: The Finkelstein test showed positive results (67%, n=238) when done on students. The majority of the participants had a positive Finkelstein test with a higher count (59%, n=211) for female participants. As the frequency of mobile phone usage increased, with more than 200 text messages sent per day (p value 0.000), progressively more people showed a positive Finkelstein test. An analysis of the association between the Finkelstein test and frequency of texting showed that 67% of people who used their mobile phone for texting were positive for the test.

Conclusion: De-Quervain's tenosynovitis is a critical cause of hand dysfunction for health care providers. Further awareness will help researchers develop an educational program for mobile texting and recommend suitable behavioral variations for avoiding this under-documented cause of tendinopathy.

Key words: De-Quervain's, Tenosynovitis,
Hand held devces, Mobile phones,
Text message injury

Introduction

De-Quervain's tenosynovitis is an inflammatory disease caused by the chronic misuse of the tendons of the extensor pollicis brevis and abductor pollicis longus muscles. Modifications in normal kinematics and anatomical determinants of a tendon in professionals are common, which may be the cause of this disease; little is known about the prevalence of this disease in medical professionals [1]. De-Quervain's could be presented as a painful wrist secondary to stenosing tenosynovitis of the thumb abductors around the radial styloid. With new occupational and professional demands the prevalence of this condition is gradually increasing. Activities that involve repeated thumb pinching and wrist movement can cause this painful condition. In the literature, this condition has various synonyms, including De-Quervain's disease, first dorsal compartment tenosynovitis, texting tenosynovitis, Blackberry Thumb, and Washer Woman's Sprain. De-Quervain's tenosynovitis is triggered by a stenosing inflammation of the tendon sheath in the first dorsal compartment of the wrist. The patient may experience associated symptoms beside pain, including dysesthesias, numbness, tingling, burning, and cramping. The most standard finding in De Quervain's tenosynovitis is a positive Finkelstein test [2]. In a big community-based study from the UK, prevalence of De-Quervain's tenosynovitis was 1.3% for women and 0.5% for men [3]. This was linked to a substantial impact on daily events. The incidence and prevalence of De-Quervain's tenosynovitis in primary care is still unknown [3]. Previous reports reveal multiple etiologies for De-Quervain's tenosynovitis that comprise acute trauma or tremendous exercise. However, it may more commonly be a consequence of accumulative micro-trauma. Therefore, those who use their hands and especially their thumb in monotonous routines are prone to get De-Quervain's. The patients may also experience progressive pain and limitation of thumb range of motion [4]. The purpose of the study is to determine the prevalence of De-Quervain's tenosynovitis and its relationship to the frequency of cell phone usage among medical professionals.

Methodology

A cross-sectional survey was conducted among medical professionals in the Makkah region, Saudi Arabia. We included all undergraduate medical students and allied medicine students at Makkah region, Saudi Arabia who performed the Finkelstein test, completed Quick-DASH score and completed the survey. The participant sample size was 354 students who were selected through convenience sampling. Data were collected from medical professionals through a validated questionnaire run by multiple orthopedic surgeons, and severity of the pain was assessed through the Universal Pain Assessment Tool. De-Quervain's tenosynovitis was diagnosed through the Finkelstein test, in which the participants were instructed to make a fist with the thumb enfolded inside the fingers. They stabilized their forearm and passively deviated the wrist. Pain at the radial wrist over the abductor pollicis longus and extensor pollicis brevis tendons indicated a positive test.

Data entry and analysis: Data entry and analysis were performed by using SPSS version 20 software. Frequency and percentages were obtained for the categorical variable. Chi-square was applied to determine the association between different variables and the Finkelstein test. P value < 0.05 is considered significant.

Application: Repetitive use of mobile phones for text messaging can lead to the damage of extensor pollicis brevis and abductor pollicis longus muscles of the thumb and their tendons, which pass through the first dorsal compartment of the wrist.

Results

Out of the total number of students who participated in the study, 85.9% (n=304) were female while 14.1% (n=50) were male. Most of the participants were in medical school (75.7%, n=268) as a specialty, with the majority in their sixth medical school year (33.3%, n=118). Most of the participant were 23-27 years old. The majority (92%) were right handed dominant, while 8% were left handed dominant [Table 1].

It was noted that as frequency of mobile phone usage progressively increased, more and more people showed a positive Finkelstein test when they sent more than 200 text messages per day (p value 0.000). An analysis of the association between the Finkelstein test and frequency of texting showed that 67% of people who used their mobile phone for texting were positive and 33% were negative for the test [Table 2].

In terms of thumb movements, 42% (n=150) had restriction of thumb movements, 44% (n=158) had pain while compressing the area, and 40% (n=142) had pain on resisted thumb extension [Table 2].

The Finkelstein test was positive in 67% (n=238) of the students. The majority of participants had a positive Finkelstein test, with a higher count for female participants (59%, n=211) [Table 3].

Almost all of the students frequently used cell phones for texting; only 37% (n=132) texted less than 50 messages per day. Another 34% (n=122) sent between 50–100 texts, 17% (n=62) between 100–200, and 10% (n= 38) sent more than 200 messages per day [Table 4].

Our study found there is a significant relationship between a positive Finkelstein test and medical specialty [Table 5]. More than 50% of the participants had a Quick-DASH score of more than 46 points, with a mean of 16 and a median of 11.3, which indicates a moderate to severe disability [Table 6] [Figure 1].

Table 1: Demographic characteristics of the participants

		Frequency	Percent	Cumulative Percent
Gender	Female	304	85.9	85.9
	Male	50	14.1	100.0
Age	23-27	208	58.8	58.8
	18-22	134	37.9	96.6
	28-32	12	3.4	100.0
Academic year	Preparatory	18	5.1	100.0
	2	19	5.4	94.9
	3	40	11.3	81.9
	4	55	15.5	70.6
	5	77	21.8	55.1
	6	118	33.3	33.3
	Internship	27	7.6	89.5
Medical College	ISNC	242	68.4	68.4
	KAU	44	12.4	80.8
	Others	18	5.1	85.9
	UQU	14	4.0	89.8
	KSAU Jeddah	13	3.7	93.5
	University of Jeddah	12	3.4	96.9
	Farabi	6	1.7	98.6
	BMC	5	1.4	100.0
Medical specialty	Medicine	268	75.7	75.7
	Allied medical science	81	22.9	98.6
	Non-medical	5	1.4	100.0

ISNC: Ibn Sina National College for Medical Studies, KAU: King Abdulaziz University, UQU: Umm Al Qura University, KSAU: King Saud Bin Abdulaziz University for Health Sciences, Farabi: Al Farabi Private College, BMC: Batterjee Medical College.

Table 2: Mobile phone use and number of text messages

		Frequency	Percent	Cumulative Percent
Mobile phone use for texting	Always	262	74.0	74.0
	Sometimes	73	20.6	94.6
	Occasionally	11	3.1	97.7
	Never	8	2.3	100.0
Number of text messages per day	<50	132	37.3	37.3
	50-100	122	34.5	71.8
	100-200	62	17.5	89.3
	>200	38	10.7	100.0

Table 3: Association between Finkelstein Test and all variables

		Finkelstein test		Total
		Negative test	Positive test	
Gender	Female	93	211	304
	Male	23	27	50
Age	18-22	36	98	134
	23-27	76	132	208
	28-32	4	8	12
Academic year	Preparatory	7	11	18
	2	9	10	19
	3	9	31	40
	4	11	44	55
	5	26	51	77
	6	47	71	118
	Internship	7	20	27
Medical College	BMC	0	5	5
	Farabi	3	3	6
	ISNC	78	164	242
	KAU	19	25	44
	KSAU Jeddah	4	9	13
	University of Jeddah	2	10	12
	UQU	1	13	14
	Others	9	9	18
Medical specialty	Medicine	90	178	268
	Allied medical science	23	58	81
	Non-medical	3	2	5
Dominant hand	Left hand	5	23	28
	Right hand	111	215	326
Pain while compressing the area	No	106	90	196
	Yes	10	148	158
Pain on resisted thumb extension	No	103	109	212
	Yes	13	129	142
Pain experience	Right hand	47	105	152
	Left hand	9	19	28
	Both	13	114	127
	None	47	0	47
Use of mobile phone for texting	never	0	8	8
	occasionally	9	2	11
	sometimes	33	40	73
	always	74	188	262
Number of text messages per day	<50	50	82	132
	50-100	37	85	122
	100-200	17	45	62
	>200	12	26	38
Restriction with thumb movement	no restriction	72	88	160
	mild	17	74	91
	moderate	20	68	88
	severe	7	8	15

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Table 4: Association between Finkelstein Test and number of messages

(I) Number of text messages per day	(J) Number of text messages per day	Mean Difference (I-J)	Std. Error	P - value
<50	50-100	-.25460-	1.68757	1.000
	100-200	-2.00391-	2.06885	1.000
	>200	-15.17145-*	2.47376	.000
50-100	<50	.25460	1.68757	1.000
	100-200	-1.74931-	2.09577	1.000
	>200	-14.91686-*	2.49632	.000
100-200	<50	2.00391	2.06885	1.000
	50-100	1.74931	2.09577	1.000
	>200	-13.16754-*	2.76837	.000
>200	<50	15.17145*	2.47376	.000
	50-100	14.91686*	2.49632	.000
	100-200	13.16754*	2.76837	.000

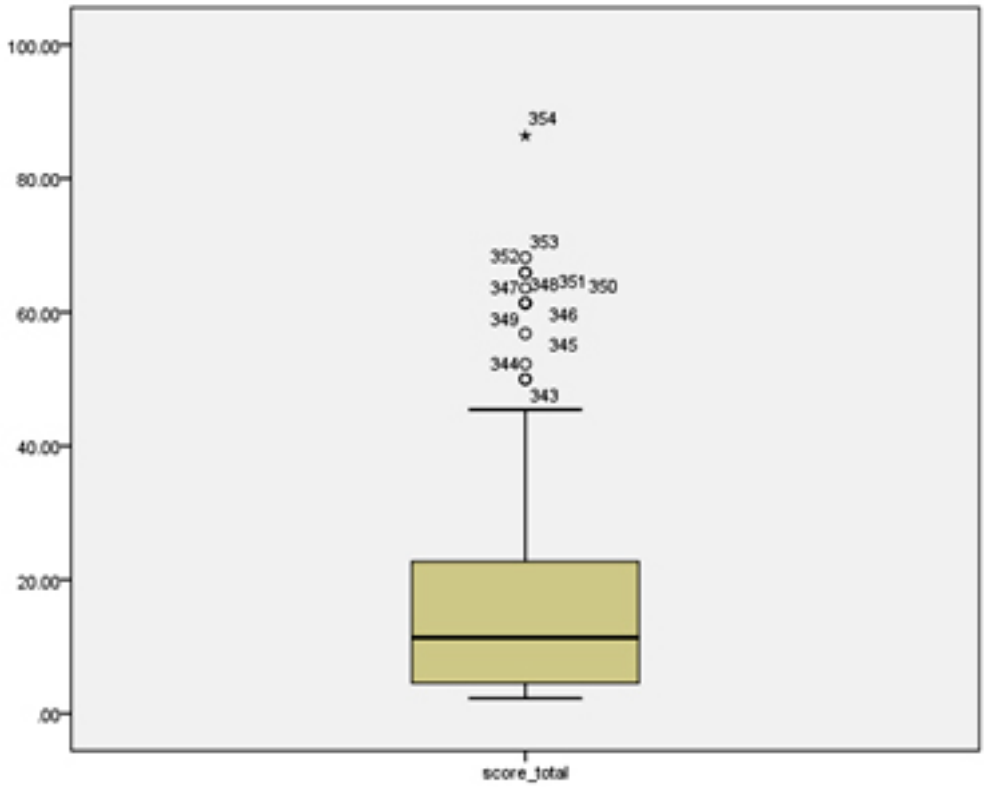
Table 5: Relationship between Finkelstein Test and medical specialty

(I) Medical specialty	(J) Medical specialty	Mean Difference (I-J)	Std. Error	Sig.
Medicine	Allied medical science	-5.64130-*	1.75953	.004
Allied medical science	Medicine	5.64130*	1.75953	.004

Table 6: Quick DASH score

			Statistic	Std. Error
Score total	Mean		16.0824	.75211
	95% Confidence Interval for Mean	Lower Bound	14.6033	
		Upper Bound	17.5616	
	5% Trimmed Mean		14.6236	
	Median		11.3636	
	Variance		200.246	
	Std. Deviation		14.15081	
	Minimum		2.27	
	Maximum		86.36	
	Range		84.09	
	Interquartile Range		18.75	
	Skewness		1.516	.130
	Kurtosis		2.857	.259

Figure 1: Distribution of participants Quick DASH score



Discussion

Notwithstanding its common presentation as an upper extremity musculoskeletal problem, the epidemiology of De-Quervain's tenosynovitis is not well known. Nevertheless, analogous surveillance to our research was seen in a study conducted by Lenhart et al., with 50% positive results for those texting 50 messages per day and 33% positive results amongst those sending 100 text messages per day [5]. Our results were significant when different hand movements were compared to results of the Finkelstein test. This was in harmony with the previous literature that obviously showed repetitive, extended, and sustained gripping and repetitive redundant movements of the thumb (e.g., chatting) as potential risk factors for De-Quervain's tenosynovitis [6,7]. In order to prevent the development of such a musculoskeletal disorder, an improved understanding of the texting technique and its relationship to muscle movement and kinematics is necessary. De-Quervain's tenosynovitis is a critical issue leading to dysfunction of the affected hand, for which further awareness would help researchers develop a background for physical guidelines for mobile texting and recommend suitable behavioral variations for avoiding this under documented cause of tendinopathy [8]. The diagnosis of De-Quervain's tenosynovitis is made by taking a history and thorough physical examination. Symptoms could include pain at the radial styloid occasionally radiating to the thumb, forearm, or shoulder, as well as swelling at the radial styloid with tenderness and crepitation with palpation. Finkelstein's test (deviating the wrist to the ulnar side, while grasping the thumb, resulting in pain) is in typical cases positive. In our study we found that the Finkelstein test showed positive results (67%, n=238) for the participating students. The majority of participants had a positive Finkelstein test, with a higher count (59%, n=211) for female participants [Table 3]. Unfortunately, there is no diagnostic test for De-Quervain's tenosynovitis. Efforts were made in 1998 and 2001 to hypothesize a consistent categorization and case-definition for soft-tissue rheumatic disorders of the upper limb, including De-Quervain's tenosynovitis [9-11]. When considering medical students, the most common causes related to SMS message texting include academic associated activities [12]. De-Quervain's tenosynovitis most commonly results from the overuse of thumb musculature, which is illustrated by pain that blows over the surface of the radial aspect of the wrist and is exaggerated by ulnar deviation of the hand [13]. We found in our study that 42% (n=150) had restriction with thumb movement, 44% (n=158) had pain while compressing the area, and 40% (n=142) had pain on resisted thumb extension [Table 2]. The prevalence of this complaint increased with new professional demands, like prolonged work on a computer [14]. In the last decade only, the 15–24 year-old age group in Sweden has had 100% access to mobile phones and 93% on average utilize it for sending text messages (SMS) [15]. Use of mobile phones has increased in the USA in teens for text messaging, from 38% in 2008 to 54% in 2009 [16]. Regarding the use of cell phones, we found that 67% (n=238) who used their mobile phone for texting had a positive Finkelstein test. Almost all of the students frequently used cell phones for texting, and out of this group, 37% (n=132) texted less than 50 messages per day. Another 34% (n=122) sent between 50–100 texts, 17% (n=62) between 100–200, and another 10% (n= 38) more than 200 messages per day. Thus, as texting increased, the prevalence of the condition increased [Table 4]. A bilateral De-Quervain's tenosynovitis case report in 2010 showed the diagnosis'

association with the patient's condition and an extreme routine of text messaging on a cell phone [17]. Clinical evaluation revealed that for a majority of the participants, the right hand was more commonly affected (92%) when compared to the left hand and bilateral association. The most common symptoms described by the participants during examination were pain on the thumb, pain on resisted thumb extension, pain while compressing the area, and restriction of thumb movement.

Conclusion

In order to prevent the development of musculoskeletal disorders, an improved understanding of the texting technique and its relationship to muscle movement and kinematics is necessary. De-Quervain's tenosynovitis is a common cause of hand dysfunction, and further awareness will help researchers develop an educational program for mobile texting and recommend suitable behavioral variations for avoiding this under the documented cause of tendinopathy. We advise mobile phone users to use both hands, have multiple breaks, slow typing, and give proper support to their forearms and back while texting.

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