

De Quervain's Tenosynovitis in Primary Caregivers

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ABSTRACT

Introduction: The purpose of this study is to evaluate the incidence of de Quervain's tenosynovitis in newborn caregivers—both male and female—as well as potential associated factors, such as child's age or weight and lactation status.

Methods: Surveys were administered from August 2014 to April 2015 to parents with young children in the greater Buffalo, New York area. Parents were asked to report wrist pain symptoms and location, number of hours spent caregiving, child's age, and lactation status. Participants who reported wrist pain performed a self-guided Finkelstein test and completed a QuickDASH questionnaire.

Results: One-hundred twenty-one surveys were returned: 9 from males and 112 from females. Ninety respondents reported no wrist/hand pain (group A), 11 reported wrist/hand pain and a negative Finkelstein test (group B), and 20 reported wrist/hand pain and a positive Finkelstein test (group C). The mean QuickDASH score in group B was significantly smaller than that of group C. On average, child age was statistically significantly different across categories of pain with the oldest population in the positive Finkelstein group (group C) (272.8 ± 196.5 vs 481.9 ± 488.9 , $P=0.007$).

Conclusions: This study supports the hypothesis that mechanical components of newborn caregiving play a major role in the development of postpartum de Quervain's tenosynovitis. It also supports the concept that hormonal changes in the lactating female are not an important contributor to the development of postpartum de Quervain's tenosynovitis. Our results, as well as previous studies, suggest a high index of suspicion for the condition must be maintained when seeing primary caregivers with wrist pain.

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INTRODUCTION

Stenosing tenosynovitis of the first dorsal compartment, also known as de Quervain's tenosynovitis, is 6 times more common in women than men¹ and is particularly common in women of child-bearing age.²⁻⁶ Postpartum de Quervain's tenosynovitis is responsible for up to 40% of all cases.⁵ Evidence is unclear regarding whether the condition is related to lactation and pregnancy or simply mechanical overuse.²⁻⁴ There is also minimal evidence regarding the potential effect of baby size and time spent per day caregiving on the development of symptoms. Additionally, men have increasingly assumed the role of primary caregiver, and it is unclear whether this exposes them to increased risk for development of de Quervain's tenosynovitis.

Our primary questions are what is the incidence of postpartum de Quervain's tenosynovitis and if factors such as lactation, baby size, time spent caregiving, and caregiver sex are associated with the symptom development. To answer these questions, we surveyed postpartum caregivers regarding sex, lactation, baby size/age, number of hours spent caregiving, and the presence or absence of wrist pain. Additionally, respondents performed the self-guided Finkelstein test and reported the results.

We hypothesized that women—especially postpartum caregivers—will have a higher incidence of de Quervain's tenosynovitis symptoms, such as wrist pain, swelling, and activity-related pain, than the general population. Additionally, we hypothesized that

baby size will be positively associated with de Quervain's tenosynovitis symptoms; however, caregiver age and lactation will not be associated with these symptoms.

METHODS

Prior to the start of the study, approval was obtained from the institutional review board. Surveys were administered from August 2014 to April 2015 at local childcare centers and pediatric offices. Inclusion criteria included caregivers who had a child within the preceding 5 years and self-identified as the primary caregiver. All study participants provided written informed consent prior to being surveyed. Participants were queried regarding sex, age, lactation status, child age, average number of hours per day spent caring for the child, presence of any wrist pain, and the location and time of onset. Respondents who admitted wrist pain performed a self-guided Finkelstein test. A picture of full flexion of the thumb and forced ulnar deviation of the wrist was provided for direction. The figure was adapted from the American Academy of Orthopaedic Surgeons. Participants rated their pain as one of the following: none, mild, moderate, severe. Participants experiencing at least mild pain were considered to have a positive Finkelstein test.

Patients admitting to any form of hand or wrist pain since the birth of their child completed a QuickDASH questionnaire—an abbreviated version of the DASH questionnaire and a self-evaluation report asking questions regarding activities of daily living and other functional activities. Respondents rated these activities on a 5-point Likert scale, and the results were transformed to a score between 0 (no disability) and 100 (most severe disability).

Based on completed questionnaires results, respondents were stratified into 3 groups: group A, no wrist/hand pain since the birth of their child; group B, wrist/hand pain since the birth of their child and a negative Finkelstein test; and group C, wrist/hand pain since the birth of their child and a positive Finkelstein test.

Statistical Methods

Descriptive statistics were used to analyze respondents' demographic data. Additionally, we utilized 2-tailed *t* test and analysis of variance (ANOVA) to test for the difference between means of continuous variables across multiple categories of wrist pain and chi-square test to determine whether distribution of categorical variables varies across multiple categories of wrist pain. For analyses, *P* values <0.05 were considered statistically significant.

RESULTS

Surveys of 121 caregivers were returned: 9 (7.4%) male and 112 (92.6%) female (Table 1). Of the 121 respondents, 90 (74.4%)

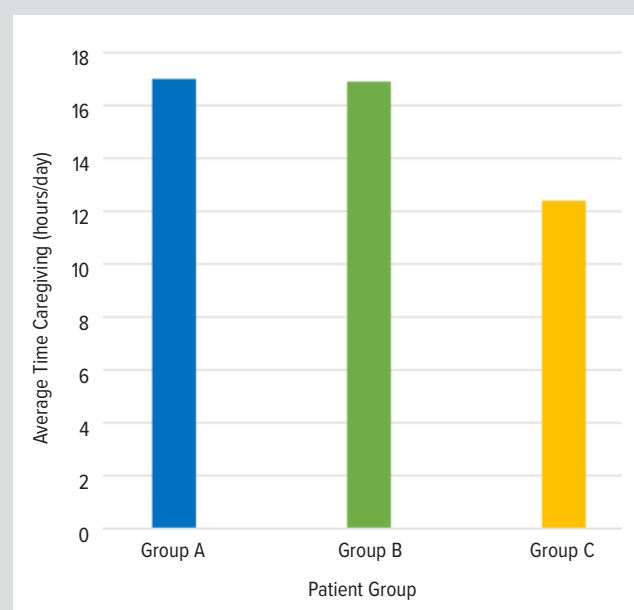
Table 1. Participants Categories Based on Wrist/Hand Pain Since Birth of Their Child and Finkelstein Test (N=121)

	Group A ^a n=90 (74.4%)	Group B ^b n=11 (9.1%)	Group C ^a n=20 (16.5%)	<i>P</i> value ^b
Age (years)	31.6±5.0	30.8±3.8	31.4±4.3	0.884
Sex (% female)	81 (90)	11 (100)	20 (100)	0.187
Hours/day caregiving	17.0±7.0	12.4±7.7	16.9±7.9	0.154
QuickDASH (0–100 scale)	N/A	11.9±6.1	32.4±18.6	0.004

^aGroup A: no wrist/hand pain; group B: wrist/hand pain, negative Finkelstein test; group C: wrist/hand pain, positive Finkelstein test.

^b*t* test and analysis of variance (ANOVA) for difference between means of continuous variable across multiple categories of wrist pain and chi-square test to determine whether distribution of categorical variables varies across multiple categories of wrist pain. *P* values of <0.05 were considered statistically significant.

Figure. Average Caregiving Time Among Groups



Group A: no wrist/hand pain; group B: wrist/hand pain, negative Finkelstein test; group C: wrist/hand pain, positive Finkelstein test.

reported no wrist/hand pain (group A) and 31 (25.6%) reported wrist/hand pain since the birth of their child. All who reported wrist/hand pain were female; 11 (9.1%) had a negative Finkelstein test (group B) and 20 (16.5%) had a positive Finkelstein test (group C). On average, respondents were 31.5±4.8 years old (Table 1). We did not find a statistically significant difference in age between wrist/hand pain groups (*P*=0.884). Respondents in group A spent, on average, more hours per day providing care to the child than the respondents in groups B and C (17±7.0 vs 12.4±7.7 vs. 16.9±7.9 hours, respectively), but it was not statistically significant (*P*=0.154). The 9 men caregivers with no reported pain spent, on average, 18.4±7.4 hours per day providing care to the child. Table 1 and Figure 1 show the mean number of hours each group spent caregiving per day across categories of wrist/hand

Table 2. Participants Child Characteristics Based on Wrist Pain and Finkelstein Test (N=121)

Variables	Group A ^a n = 90 (74.4%)	Group B ^a n = 11 (9.1%)	Group C ^a n = 20 (16.5%)	P value ^b
Child age (days)	272.8 ± 196.5	278.4 ± 136.2	481.9 ± 488.9	0.007
Child weight (pounds/ounces)	16.5 ± 6.2	19.7 ± 4.6	18.7 ± 4.9	0.152
Lactation (% yes)	37 (41.1)	5 (45.5)	8 (40)	0.725

^aGroup A: no wrist/hand pain; group B: wrist/hand pain, negative Finkelstein test; group C: wrist/hand pain, positive Finkelstein test.

^bt test and analysis of variance (ANOVA) for difference between means of continuous variable across multiple categories of wrist pain and chi-square test to determine whether distribution of categorical variables varies across multiple categories of wrist pain. P values of <0.05 were considered statistically significant.

pain. The mean QuickDASH score in group B was significantly smaller than group C (11.9 ± 6.1 vs 32.4 ± 18.6, $P=0.004$) (Table 1). A statistically significant difference was observed for child age across different categories of pain, with the oldest population in the positive Finkelstein group (group C) (272.8 ± 196.5 vs 481.9 ± 488.9, $P=0.007$) (Table 2).

DISCUSSION

In 1895, Fritz de Quervain published a report of 5 case studies on the stenosing tenosynovitis of the first dorsal compartment.⁷ Since this time, the condition has been termed de Quervain's tenosynovitis, and 120 years later we still do not know its specific cause. Though there are limited pure epidemiology studies on de Quervain's tenosynovitis, current literature suggests an overall incidence of about 1% to 3%.^{1,8,9} It has been well-established that the condition is more common in women than in men.¹⁻³ After evaluating a large military database, Wolf et al reported that women had a significantly higher rate of de Quervain's tenosynovitis at 2.8 cases per 1000 person-years compared to 0.6 cases per 1000 person-years for men.⁴ Other studies have reported ratios as high as 6:1 female to male.¹

Here we present the results of a survey aimed at female and male primary caregivers of newborns to determine the incidence of de Quervain's tenosynovitis and relationship between lactation, number of hours spent per day caregiving, and reported degree of disability. Of 121 surveys completed, 20 (16.5%) respondents were diagnosed with de Quervain's tenosynovitis based on their questionnaire and self-guided Finkelstein test, suggesting a much higher incidence among postpartum caregivers than previously reported in the general population.

Within the female population, the disease tends to be more common among women of child bearing age or women who are breastfeeding or pregnant.⁸ While an extensive meta-analysis on work-related causes of de Quervain's tenosynovitis determined that there was no causal relationship between the condition and occupational risk factors, it has been suggested that a mechanical component may lead to the development of postpartum de Quervain's tenosynovitis.^{1,10} In addition, the overall prevalence has not been shown to be increased in the dominant hand.^{1,10} These

observations led some to believe hormonal changes played a large role in the development of de Quervain's tenosynovitis in pregnant and lactating women.

Following these findings, studies were performed on hormonal involvement in de Quervain's tenosynovitis. Cellular-level changes in de Quervain's tenosynovitis have been well-documented as an increase in mucopolysaccharides within the tendon sheath representing myxoid degeneration.¹¹ It was thought that hormonal

changes during pregnancy may alter the histologic changes seen in the condition. However, after examining synovial specimens from de Quervain's tenosynovitis both related and unrelated to pregnancy, Read et al found that the histopathological appearance of de Quervain's tenosynovitis in both groups had no significant differences.⁸ Based on these results, it was postulated that postpartum de Quervain's tenosynovitis was likely secondary to the mechanical stresses related to caregiving and not hormonal changes. Our study found that half of the caregivers diagnosed with de Quervain's tenosynovitis were lactating and the other half were not, reinforcing the notion that hormonal changes in lactating females are not a major contributing factor in development of postpartum de Quervain's tenosynovitis.

Acknowledging that a mechanical component to newborn caregiving plays a major role in the development of postpartum de Quervain's tenosynovitis, we hypothesized there would be an increase incidence of the condition in male caregivers. However, of the 9 males surveyed, none were found to have de Quervain's tenosynovitis. Certainly, the low sample size may have contributed to this finding.

When comparing the QuickDASH scores between group C (positive Finkelstein tet) and group B (negative Finkelstein test), group C had an average score over 3 times higher than group B ($P=0.004$). This reiterates the amount of disability that may be associated with de Quervain's tenosynovitis and highlights the importance of patient education in the postpartum period. Bynum discussed different techniques, including the "scoop technique," when handling infants in the postpartum period to help reduce the likelihood of developing de Quervain's tenosynovitis.¹² Lactation consultants also have begun to stress the importance of reducing the mechanical factors related to holding newborns to help diminish pain and discomfort associated with de Quervain's tenosynovitis.¹³

Finally, we did not see any association between hours per day of caregiving and the diagnoses of de Quervain's tenosynovitis. One could presume that more hours caregiving would predispose one to the development of the disease. While we did find a statistically significant difference between all three groups—and groups A and C ($P=0.007$)—related to age of the child, which could be a proxy

measure for overall duration of child care, respondents did not specifically comment on how long they were holding the newborn. If in fact it is a mechanical component that contributes to postpartum de Quervain's tenosynovitis, the focus of future studies will look specifically at hours spent holding the newborn.

Study Limitations

There are several limitations to this study. First, our findings could be influenced by the limited sample size, although we did find statistically significant differences in QuickDASH and babies age between wrist/hand pain groups, despite a small sample size. Second, as the study utilizes a questionnaire and self-guided Finkelstein test to diagnose postpartum de Quervain's tenosynovitis instead of an evaluation by a medical provider, self-reported and recall bias could be introduced. Third, one of the study aims was to investigate both male and female caregivers; however, a disproportionate number of females to males returned the survey. Moving forward, further studies analyzing an equal number of female to male newborn caregivers, in a larger sample size, would be beneficial.

CONCLUSIONS

This study supports the hypotheses that mechanical components of newborn caregiving play a major role in the development of postpartum de Quervain's tenosynovitis and hormonal changes in the lactating female are not an important contributor to postpartum development of the condition. These findings, as well as previous studies, suggest that a high index of suspicion for de Quervain's tenosynovitis must be maintained when seeing primary caregivers with wrist pain.

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