

## Prevalence of de Quervain's Disease in the General Population and Risk Factors

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**Background & Aims :** De Quervain's disease is known as a representative disease that causes wrist pain, however, its epidemiology remains unclear. The purpose of this study was to elucidate the prevalence of de Quervain's disease among the general population and to identify its risk factors. **Methods :** The subjects participated in the examinations consisted of 402 people (total of 804 hands), including 157 males and 245 females with mean age of 64.1 years. We recorded the subjects' background and medical history and then performed physical examinations. We determined the prevalence of de Quervain's disease and conducted a statistical analysis to investigate their background factors. **Results :** De Quervain's disease was present in 3.7% (15/402 people) and the prevalence by age group was 9.8% in their forties, 3.6% in their fifties, 1.8% in their sixties, 3.9% in their seventies, and 3.7% in their eighties. The prevalence was significantly higher in females than in males. No difference was found in terms of the mean age, hand dominance, height, weight, heaviness of labor activity and presence of medical complication. **Conclusions :** In the general population, 3.7% of 402 people had de Quervain's disease, and its risk factor was identified to be females. (Kitakanto Med J 2011 ; 61 : 479~482)

**Key words :** de Quervain's disease, epidemiology, population-based study, risk factors

### Introduction

De Quervain's disease, which is tenosynovitis stenosis in abductor pollicis longus tendon and extensor pollicis brevis tendon, is known as a representative disease that causes pain in the wrist.<sup>1,2</sup> Epidemiologically, the disease is presumed to be more frequent in women in their thirties to sixties<sup>3-5</sup>; however, no report in the literature has described a direct medical checkup conducted among the general population. Investigation of the pathogenic risk factors has also been insufficient.

The objective of this study is to clarify the true prevalence of de Quervain's disease among the general population and to identify the risk factors of the onset of the disease via investigation of the background factors of the disease.

A further objective of this study is to clarify the prevalence and background factors in women.

### Materials and Methods

A medical check-up, which was intended to help prevent lifestyle-related disease and the early detection of cancer, was conducted for Japanese residents of a mountain village in Japan, where agroforestry and tourism are the main industries. Of those subjects, we randomly picked 402 of the subjects (total of 804 hands) to examine their hands, thus representing approximately 8 % of the population of the village and consisting of 157 males (314 hands) and 245 females (490 hands), with a mean age of 64.1 years (range, 30-88 years). Those with any of the following conditions were excluded : wrist deformity or contracture ; past history of wrist injury ; and complication with another disease that affects the wrist, such as rheumatoid arthritis.

First, an interview was conducted to confirm the age, gender, dominant arm, heaviness of labor activity,

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presence of medical complication, history of cigarette smoking, degree of the drinking, and presence of subjective wrist pain. The heaviness of labor activity was reported in the interview by the four levels of no, light, intermediate, and hard labor activity for the subjective intensity of labor activity. Regarding the presence of medical complication, cases with current or past treatment history of hypertension, diabetes, hyperlipemia, stroke or heart disease were classified as having complications. For the smoking history of each individual, current or past habitual smoking was judged as having a smoking history. The alcohol consumption level was reported in the interview according to three levels: almost every day, sometimes, and no drinking.

Height and weight were measured as checkup parameters. The body-mass index (BMI) was calculated from them. As the observation on the wrist, the presence of tenderness in the first extensor compartment was checked. The Eichhoff test was conducted according to the procedure reported by Eichhoff<sup>6</sup>: cases were judged as positive if strong pain was induced at the processus styloideus radii when the hand was bent strongly toward the ulnar direction with the thumb on the palm and holding it with the fingers. A case that met all the three of the following was diagnosed as de Quervain's disease: subjective wrist pain, tenderness in the first extensor compartment, and a positive Eichhoff test result.

First, the prevalence of de Quervain's disease by age group was shown and the 95% confidence interval was ascertained. Furthermore, to elucidate the risk factors of de Quervain's disease, subjects were classified into two groups by the presence or absence of de Quervain's disease. Then the groups were compared for the background factors described earlier. For the statistical test, Student's *t* test was used for comparison of the mean age, height, weight and BMI; Mann-Whitney's U test was used for comparison of the labor activity intensity and the alcohol consumption level. Fisher's direct method was used for comparison of whether the affected hand was dominant, and of sex, presence of medical complication, and smoking history. These evaluation criteria for the addition of all subjects, were also analyzed to investigate the association of women. Moreover, a stepwise forward logistic regression analysis was used to identify the risk factors of de Quervain's disease in the general population, using the following factors explaining variables: age, gender, BMI, heaviness of labor, history of cigarette smoking, and degree of the drinking. All Statistical analyses were conducted using a software program (IBM SPSS Statistics 19; IBM Japan, Ltd., Tokyo, Japan). Significance was inferred for  $p < 0.05$ .

## Results

De Quervain's disease was found in 3.7% of all subjects (15/402 subjects). Its prevalence by age group was 0.0% for subjects in their thirties and below, 9.8% (95% CI: 0.7-18.9%) for subjects in their in forties, 3.6% (95% CI: -0.4 to 7.6%) for subjects in their in fifties, 1.8% (95% CI: -0.7 to 4.3%) for subjects in their in sixties, 3.9% (95% CI: 0.5-7.3%) for subjects in their in seventies, and 3.7% (95% CI: -3.4 to 10.8%) for subjects in their in eighties (Table 1). Of 15 subjects with de Quervain's disease, 7 were affected in the dominant hand, 6 were affected in the nondominant hand, and 2 were affected in both hands.

**Table 1** The prevalence of de Quervain's disease by age group.

	prevalence		95%CI
total	3.7%	(15/402)	1.9-5.5%
under 30s	0.0%	(0/11)	
40s	9.8%	(4/52)	0.7-18.9%
50s	3.6%	(3/84)	-0.4-7.6%
60s	1.8%	(2/111)	-0.7-4.3%
70s	3.9%	(5/128)	0.5-7.3%
over 80s	3.7%	(1/27)	-3.4-10.8%

CI=confidence interval

And this disease was found in 5.3% of all female subjects (13/245 subjects). Its prevalence by age group was 0.0% for female subjects in their thirties and below, 16.0% (95% CI: 1.6-30.4%) for subjects in their in forties, 3.6% (95% CI: -1.3 to 8.5%) for subjects in their in fifties, 2.6% (95% CI: -1.0 to 6.2%) for subjects in their in sixties, 5.8% (95% CI: 0.3-11.3%) for subjects in their in seventies, and 8.3% (95% CI: 7.3-23.6%) for subjects in their in eighties (Table 2).

Regarding background factors, de Quervain's disease was present in 2/314 hands in males (1.3%) and 15/490 hands in females (5.3%): the prevalence was significantly higher in females than in males ( $p = 0.022$ ). No difference was found between groups in terms of the mean age, hand dominance, height, weight, labor activity intensity, presence of medical complication, smoking history, or alcohol consumption level (Table 3).

In addition, smoking rate in the subject we studied, male was 54.8% (86/157), and female was 6.1% (15/245). The national average of smoking rate was 36.8% in men and 9.1% in women. Surveyed on drinking rate, male was 80.9% (127/157), and female was 44.9% (110/245). The national average of drinking rate was 83.1% in men and 60.9% in women.

Additionally, similar tests were examined in a risk factor for women, found no clear difference except BMI

**Table 2** The prevalence of de Quervain's disease by age group and gender

	prevalence		95%CI	
	men	women	men	women
total	1.3% (2/157)	5.3% (13/245)	-0.5-3.1%	2.5-8.1%
under 30s	0.0% (0/4)	0.0% (0/7)	—	—
40s	0.0% (0/16)	16.0% (4/25)	—	1.6-30.4%
50s	3.4% (1/29)	3.6% (2/55)	-3.2-10.0%	-1.3-8.5%
60s	0.0% (0/34)	2.6% (2/77)	—	-1.0-6.2%
70s	1.7% (1/59)	5.8% (4/69)	-1.6-5.0%	0.3-11.3%
over 80s	0.0% (0/15)	8.3% (1/12)	—	7.3-23.6%

CI=confidence interval

**Table 3** The difference between two groups by the presence or absence of de Quervain's disease

	with de Quervain disease (n=15)	without de Quervain disease (n=387)	p value
mean age(years old)	63.4±14.0	64.1±11.9	0.83
gender ; male/female	2/13 (13.3%/86.7%)	155/232 (40.1%/59.9%)	0.02
dominant arm ; dominant/non-dominant	9/8 (52.9%/47.1%)		1.00
height(cm)	154.5±10.4	155.2±8.9	0.73
body weight(kg)	61.0±13.5	57.1±10.3	0.23
BMI	25.5±4.4	23.6±3.2	0.09
heaviness of labor ; non/light/intermediate/heavy	0/3/7/5 (0%/20%/46.7%/33.3%)	15/101/184/87 (3.9%/26.1%/47.5%/22.5%)	0.27
complication hypertension ; presence/absence	4/11 (26.7%/73.3%)	134/253 (34.6%/65.4%)	0.80
diabetes mellitus ; presence/absence	1/14 (6.7%/93.3%)	15/372 (3.9%/96.1%)	0.14
hyperlipemia ; presence/absence	2/13 (13.3%/86.7%)	47/340 (12.1%/87.9%)	0.45
cerebrovascular accident ; presence/absence	1/14 (6.7%/93.3%)	27/360 (7.0%/93.0%)	1.00
heart trouble ; presence/absence	1/14 (6.7%/93.3%)	30/357 (7.8%/92.2%)	1.00
History of cigarette smoking ; presence/absence	1/14 (6.7%/93.3%)	100/287 (25.8%/74.2%)	0.09
Degree of the drinking ; every day/sometimes/no drinking	1/6/8 (6.7%/40.0%/53.3%)	69/161/157 (17.8%/41.6%/40.6%)	0.57

**Table 4** The difference between two groups by the presence or absence of de Quervain's disease (women)

	with de Quervain disease (n=13)	without de Quervain disease (n=232)	p value
mean age (years old)	63.4±13.5	63.3±11.5	—
height (cm)	152.4±8.8	150.7±7.1	0.53
body weight (kg)	60.0±13.0	53.3±8.6	0.12
BMI	25.7±5.0	23.4±3.5	0.03
heaviness of labor ; non/light/intermediate/heavy	0/3/6/4 (0%/23.1%/46.1%/30.8%)	5/59/121/47 (2.1%/25.4%/52.2%/20.3%)	0.79
complication hypertension ; presence/absence	4/9 (30.8%/69.2%)	76/156 (32.8%/67.2%)	0.19
diabetes mellitus ; presence/absence	1/12 (7.7%/92.3%)	10/222 (4.3%/95.7%)	0.15
hyperlipemia ; presence/absence	2/11 (15.4%/84.6%)	36/196 (15.5%/84.5%)	0.19
cerebrovascular accident ; presence/absence	1/12 (7.7%/92.3%)	15/217 (6.5%/93.5%)	0.19
heart trouble ; presence/absence	1/12 (7.7%/92.3%)	14/218 (6.0%/94.0%)	0.18
History of cigarette smoking ; presence/absence	1/12 (7.7%/92.3%)	14/218 (6.0%/94.0%)	0.89
Degree of the drinking ; every day/sometimes/no drinking	1/6/6 (7.7%/46.1%/46.1%)	16/87/129 (6.9%/36.2%/55.6%)	0.71

**Table 5** Risk factors for de Quervain's disease

	Odds ratio	95% CI	p value
Age	0.97	0.91-1.02	0.25
BMI	1.16	1.02-1.33	0.03
Heaviness of labor	1.73	0.81-3.70	0.16
History of cigarette smoking	0.80	—	0.94
Degree of the drinking	0.40	0.12-1.33	0.14

among the two groups (Table 4).

The logistic regression analysis revealed that BMI was significantly associated with the risk factor of de Quervain's disease. P value for BMI was 0.03 (95% CI: 1.95-197.68). But we have not obtained significant differences in factors other than BMI (Table 5).

## Discussion

Regarding the prevalence of de Quervain's disease, Wolf *et al.* conducted an investigation of United States military personnel based on The Defense Medical Epidemiology Database, and reported that it was 0.94 per 1000 person-years.<sup>7</sup> Roquelaure *et al.* conducted investigations based on the epidemiologic surveillance system of work-related, upper-limb musculoskeletal disorders, and reported that the prevalence of de Quervain's disease was 0.7% in males and 2.1% in females.<sup>8</sup> Walker-Bone *et al.* reportedly extracted 1960 individuals with upper limb conditions from 9696 randomly selected workers aged 25–64 years and observed de Quervain's tenosynovitis in 8 hands of 777 males and in 31 hands of 1183 individuals.<sup>9</sup> However, these studies only examined the prevalence among a few subjects such as workers. The true prevalence of de Quervain's disease among the general population remains unknown. Moreover, the reports explained above were surveys of databases. Therefore, direct diagnosis was not conducted and the diagnostic criteria for de Quervain's disease were not clearly described. It is possible that intersection syndrome was accidentally included if the data were not based on accurate diagnoses by physicians, or for other reasons. In this study, direct diagnosis was conducted in the general population without limiting the subjects: de Quervain's disease was present in 3.7% (15/402 individuals) of all the subjects. No similar investigation has been reported. This report is the first evidence indicating widespread prevalence of this disease.

Regarding the risk factors of de Quervain's disease, Wolf *et al.* reported high prevalence among females over 40 years of age in an investigation in United States military personnel,<sup>8</sup> and no other report statistically demonstrates the risk factors of de Quervain's disease. Johnson stated that de Quervain's disease occurred more frequently in woman between the ages of 20 and 40, including the variant that occurs during pregnancy and the postpartum period.<sup>8</sup> However, Harvey *et al.* stated that de Quervain's disease was more frequent in females in their forties and sixties, that the increased incidence in the third and fourth decades was probably related to child care, and that the cause is almost always related to overuse of the related muscles, either at home or at work, or is associated with rheumatoid arthritis.<sup>10</sup> Our investiga-

tion also clarified that females face and obesity a greater risk of de Quervain's disease, although no relation with de Quervain's disease could be found for the other background factors such as age, dominant arm, height, body weight, heaviness of labor activity, presence of medical complications, smoking history, or alcohol consumption level. No significantly difference in body weight, but we have obtained the difference in BMI. No report about relationship between BMI and de Quervain's disease, but high BMI may increase stress on the wrist.

This study has limitations: few subjects were younger than forty, prevalence of the small number of men and the study used a cross-sectional design. It also is possible that the prevalence of de Quervain's disease differs among regions and ethnic groups. Therefore further investigations are expected to consider these aspects. Although de Quervain's disease is a frequently occurring disease, it is presumed that useful information for the planning of the therapeutic strategy will be provided by clarifying its epidemiology and natural history.

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