

Gender Ratio of Dupuytren's Disease in the Modern U.S. Population

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Abstract Epidemiological studies conducted largely in northern Europe and Australia have shown that Dupuytren's disease is less common in women, with reported overall male-to-female ratios ranging from 3:1 to 9.5:1. Epidemiological data from other countries cannot be extrapolated to the modern U.S. population due to genetic and environmental differences between populations. The aim of this study was to determine the gender ratio in Dupuytren's disease in the Boston, MA area. We conducted a retrospective study of patients diagnosed with Dupuytren's disease at two large academic hospitals in Boston, MA between the years January 1995 and July 2006. To minimize variability introduced by clinical diagnosis, we also used internal billing records to identify a subset of patients who received fasciectomy for Dupuytren's disease during this period. A total of 1,815 patients (1,150 men, 665 women) were identified at our institutions with a clinical diagnosis of Dupuytren's disease, giving an overall male-to-female ratio of 1.7:1. Of these, 234 patients (176 men, 58 women) received fasciectomy performed by the two senior authors, resulting in a male-to-female ratio of 3.0:1. The male-to-female ratio for patients younger than 54 years of age was 4.0:1, and the ratio

approached 1:1 with increasing age. The male-to-female ratio observed in our patient population was lower than those previously reported in the literature, particularly for patients younger than 54 years of age. This study indicates that large-scale epidemiological studies are needed to accurately report Dupuytren's disease in the modern U.S. population.

Keywords Dupuytren's disease · Gender ratio · Epidemiology

Introduction

Dupuytren's disease is a relatively common fibroproliferative condition of the hand primarily affecting individuals of northern European descent. Through epidemiological studies conducted largely in northern Europe and Australia where the disease is most prevalent, it has generally been accepted that Dupuytren's disease is much less common in women than men, with reported overall male-to-female ratios ranging from 3.0:1 to 9.5:1 [8–10, 12]. Studies have shown that the difference in prevalence is age-dependent, with the male-to-female ratio approaching 1:1 by the eighth or ninth decades of life [1, 6, 10].

The overall prevalence of Dupuytren's disease has been found to range from 2–42%, varying greatly even within small geographic areas [2, 8–10]. Due to genetic and environmental differences between populations, the epidemiological characteristics of Dupuytren's disease cannot accurately be extrapolated to the U.S. population. We conducted a retrospective study of patients diagnosed with Dupuytren's disease at two large hospitals in Boston, MA to determine the relative proportion of men and women presenting with Dupuytren's disease in our patient population.

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Table 1 Overall gender ratios.

Parameters	Men (<i>n</i>)	Women (<i>n</i>)	Male:Female Ratio
Diagnosis of DC (all providers)	1,150	665	1.7
Diagnosis of DC (subset)	284	137	2.1
Subset treated surgically	176	58	3.0
Age ^a			
<45	16	4	4.0
45–54	28	7	4.0
55–64	56	21	2.7
65–74	52	19	2.7
>74	24	7	3.4
Overall	176	58	3.0

^a Gender ratio for subset of patients treated surgically.

DC Dupuytren's contracture

Methods

We identified potential cases using our institution's Research Patient Data Registry (RPDR), which can identify patients with specific demographics, diagnoses, and procedures. We used the RPDR Query Tool to identify patients with ICD-9 (International Classification of Diseases-Clinical Modification, Ninth Edition) diagnosis code 728.6 for Dupuytren's disease between the years January 1995 and July 2006. Using internal billing records, we also identified all patients diagnosed with Dupuytren's disease receiving subtotal fasciectomy performed by the two senior authors (JBJ, BPS). Internal billing records were searched using ICD-9 diagnosis code 728.6 for Dupuytren's disease combined with Current Procedural Terminology (CPT) codes 26121 and 26123. The treatment with subtotal fasciectomy was confirmed in each patient's detailed medical records. This retrospective medical records review was approved by the Human Research Committee.

Statistical analysis of the data was performed using SPSS Version 14 for Windows (SPSS, Chicago, Illinois). Dichotomized variables were compared with the Chi-square test and Fisher's exact test. The Student's *t* test was used for comparison of continuous variables. A *p* value < 0.05 was considered statistically significant.

Table 2 Age at first operation.

Age	1 Operation	2 Operations	3 Operations	<i>p</i> value
Men (years)	64.4	59.0	52.6	<0.01
Women (years)	61.8	62.6	58.2	0.78

Table 3 Clinical characteristics.

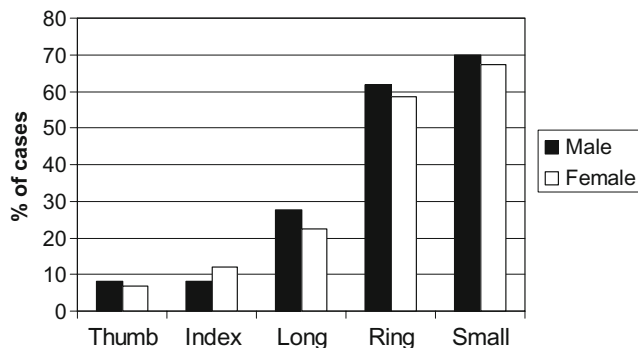
Characteristics	Men (%)	Women (%)	<i>p</i> value
Percent reoperation	30.7	22.4	0.32
Percent recurrence	26.1	20.7	0.25
Percent bilateral involvement	21.0	15.5	0.33

Results

A total of 1,815 consecutive patients (1,150 men, 665 women) were identified at our institutions with a clinical diagnosis of Dupuytren's contracture, giving an overall male-to-female ratio of 1.7:1 (Table 1). Of these, 421 patients (284 men, 137 women, male-to-female ratio=2:1) were seen by the two senior authors with 234 of these patients (176 men, 58 women, male-to-female ratio=3:1) receiving surgical treatment (Table 1). This subset of patients receiving surgical treatment was further analyzed as the pathology report provided greater diagnostic reliability compared to solely clinical diagnosis [7].

The male-to-female ratio was found to be higher in patients younger than 54 years of age (4.0:1), and the male-to-female ratio decreased with increasing age (Table 1). In addition, men with severe disease requiring multiple operations were found to have an earlier age at first operation (*p*<0.01) (Table 2).

Other trends were observed in the clinical presentation of Dupuytren's disease between men and women, but none reached statistical significance. The mean ages at first operation for men and women were 62.2 and 61.6 years, respectively (*p*=0.74). Of men, 30.7% required additional operations compared to 22.4% of women (*p*=0.32), and 26.1% of men had recurrence of Dupuytren's disease in the same digit compared to 20.7% of women (*p*=0.25). Bilateral hand involvement was found in 21.0% of men and 15.5% of women (*p*=0.33) (Table 3). The average number of involved digits was 1.8 in women compared to 2.0 in men (*p*=0.38). The small finger was the most frequently involved digit in both men and women (69.9 and

**Figure 1** Finger involvement among surgically treated patients.

67.2%, respectively), followed by the ring finger, long finger, index finger, and thumb (Fig. 1).

Discussion

Epidemiological studies have reported gender ratios in Dupuytren's contracture that differ depending upon the geographical area studied. Population studies revealed significantly higher prevalence in Northern Europeans when compared to other groups such as Southern Europeans and Asians [8], and gender ratios have been found to range from 3:1 (USA) [11] to 9.5:1 (Scotland) [3]. Early [1] conducted a large population study in Manchester, England in 1962 that revealed a male-to-female ratio of 8.2:1 in patients younger than 65 years and a ratio of 2:1 in patients older than 75 years, concluding that with age, the rates tend to be comparable between both genders. A large population study conducted by Mikkelsen et al. screened 16,000 inhabitants of a small coastal Norwegian town and found a male-to-female ratio of 5.8:1 for persons aged 50–54; this ratio decreased with increasing age to 1.2:1 for ages 85–89 [6]. Studies by McFarlane [5] and Wilbrand [10] also found higher rates in men, 9.5:1 and 5.9:1, respectively. The only epidemiological study performed in the U.S. is that of Yost et al., who reported a male-to-female ratio of 3:1 in a group of 171 patients diagnosed with Dupuytren's contracture from a total 5,062 screened individuals at the New York Hospital for unrelated illnesses [11].

Acknowledging differences between populations, our investigation provides epidemiological data for a particular subpopulation of the U.S., namely, the Boston, MA area, which is necessary to understand the gender composition of our patient population. Epidemiological data from other countries cannot be extrapolated due to genetic and environmental differences between populations.

Our results suggest that the male-to-female ratio reported in the literature is not reflective of our patient population. Our observed overall male-to-female ratios of 1.7:1 (clinical diagnosis) and 3.0:1 (fasciectomy) are lower than those reported by previous epidemiological studies. In particular, our observed male-to-female ratio of 4.0:1 for patients less than 54 years of age is lower than previously reported ratios for this age group [1, 2, 6]. The overall gender ratio of 3.0:1 is consistent with that published by Yost et al., further supporting our observation that the clinical presentation of Dupuytren's disease in the U.S. population is significantly different from Northern Europe where most epidemiological studies are performed.

Despite strong epidemiological design, the large population studies that have established the existing gender ratios are subject to inconsistent methods of clinical diagnosis of Dupuytren's disease. Noble et al. [7] showed

that the prevalence of Dupuytren's disease varied from 18 to 42% depending on whether the diagnosis was made by a hand surgeon or an endocrinologist, and Lennox et al. [3] provided evidence for inconsistent diagnosis even among orthopedic surgeons. Our study design differs from other epidemiological publications, as it was based on a pathology gold standard of diagnosis. We preferred to analyze gender ratio using the subset of patients who were treated surgically to obtain data that was not subject to the variability of clinical diagnosis.

Our findings in terms of differences between males and females for age at initial surgery and rates of re-operation and recurrence are consistent with other studies. We found that males tended to have higher rates of recurrence and re-operation, consistent with previous studies that suggested that Dupuytren's disease is less aggressive in women than men [4, 10]. There was a significant trend of earlier age at first presentation among men requiring multiple surgeries, indicating that early age of onset is associated with a more severe disease [4, 10]. However, we did not observe statistically significant differences in age of first presentation between genders that has been demonstrated in other studies [6, 8, 10].

The influence of gender in the etiology of Dupuytren's disease is unknown. Certainly, the genetic component of Dupuytren's contracture is generally more accepted than occupational or environmental factors, despite the fact that genetic theories such as autosomal dominant transmission with variable penetrance have been inconsistent [9]. To determine the etiological role of gender in a multifactorial condition, it is necessary to address, in future investigations, the influence of environmental or biological factors commonly associated with Dupuytren's disease such as smoking and diabetes mellitus, which likely have a close connection with inherited susceptibility.

Additional work is necessary to accurately report the prevalence of Dupuytren's disease in the modern U.S. population. The present study reports only on a subpopulation of the U.S. in the Boston, MA area. Determination of the true prevalence of Dupuytren's disease in the U.S. will require large-scale, nationwide epidemiological studies that are not susceptible to systematic biases. Clinical diagnosis is greatly aided by epidemiological data, and data cannot be extrapolated in a multifactorial condition such as Dupuytren's disease that has been shown to have large geographic variability.

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