

Dupuytren's Disease in the Hispanic Population: A 10-Year Retrospective Review

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Background: Dupuytren's disease is a common benign fibroproliferative disorder of the hand. Epidemiologic studies have reported significant variation in disease prevalence among races, focusing primarily on those of northern European descent. In contrast, Dupuytren's disease in the Hispanic population has received little attention. Thus, in this study, the authors aimed to determine the prevalence and operative rate of Dupuytren's disease in the Hispanic, black, white, Asian, Native American, and other races and to characterize the disease presentation in Hispanics who required surgical treatment.

Methods: A retrospective review was conducted to identify the racial distribution of Dupuytren's disease patients seen at Bellevue Hospital between July of 2000 and August of 2010. In Hispanic patients requiring surgical treatment for their disease, data were collected on the following parameters: age, sex, ethnicity, hand dominance, hand affected, and digits operated on. Epidemiologic factors including smoking, alcoholism, diabetes mellitus, hypercholesterolemia, epilepsy, and hypertension were also evaluated.

Results: Dupuytren's disease prevalence was found to be 533 per 100,000 in Hispanics. Of these patients, 1.8 percent required surgical treatment, and this group was characterized by the following comorbidities: smoking (57.1 percent), hypertension (57.1 percent), alcoholism (52.4 percent), diabetes mellitus (47.6 percent), and hypercholesterolemia (19.0 percent).

Conclusions: The authors' results indicate that Dupuytren's disease is more prevalent in the Hispanic population than previously reported. Although the epidemiologic factors identified in Hispanics with Dupuytren's disease are similar to those in other races investigated, there are important differences with respect to clinical presentation and surgical treatment. (*Plast. Reconstr. Surg.* 128: 1251, 2011.)

Dupuytren's disease is a common benign fibroproliferative disorder that can be psychosocially and physically disabling to patients. Although its etiopathology remains incompletely understood, Dupuytren's disease is thought to be precipitated by a proliferation of contractile fibroblasts and myofibroblasts within the palmar fascia.¹ This fibroblastic response initially presents as a nodule and slowly develops into abnormal scar-like tissue that can cause a flexion contracture of any digit, often along with skin pitting, tenderness, and dimpling.² In its advanced stages, Dupuytren's dis-

ease leads to a progressive and irreversible contraction of the palmar fascia and the involved digits.³

Both population studies and family studies support an autosomal dominant inheritance pattern of Dupuytren's disease with incomplete penetrance.⁴ Overall, the prevalence ranges from 0.2 to 56 percent, varying greatly between geographic areas and races, with the highest rate recorded in a group of epileptic patients as a result of prolonged administration of anticonvulsants.⁵ Moreover, gender studies on Dupuytren's disease have described male-to-female ratios ranging from 3:1 to 9.5:1.⁶⁻¹⁰ Although the disease has been identified in persons of all racial groups,^{11,12} the highest prevalence reported in ethnicity studies is in those of northern European descent (i.e., from

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Scotland, Iceland, Norway, and Austria).¹³ As such, Dupuytren's disease has been labeled as the "Viking" or "Nordic" disease, and the vast majority of research has focused on its characterization in these populations.¹⁰ Interestingly, no objective scientific evidence has been identified to confirm a Nordic origin of the disease.¹⁰

Saboeiro et al.¹⁴ published the racial distribution of Dupuytren's disease prevalence in the U.S. Department of Veterans Affairs patient population. Their study revealed a prevalence rate of 130 per 100,000 blacks, 734 per 100,000 whites, 237 per 100,000 white Hispanics, 144 per 100,000 Native Americans, and 67 per 100,000 Asians. However, the Veterans Affairs patients are a unique population and, as a result, may not accurately represent the racial distribution of the disease.¹⁴ Furthermore, the authors did not comment on the extent of the disease in Hispanics.

In our experience, we have anecdotally noted an increased number of Hispanic patients with Dupuytren's disease, both in overall disease diagnosis and in those requiring surgical treatment for advanced disease. Thus, in this study, we sought to determine the prevalence and operative rate of Dupuytren's disease in the Hispanic, black, white, Asian, Native American, and other races and to characterize the disease presentation in Hispanics who required surgical treatment.

PATIENTS AND METHODS

Study Sample

A retrospective review of the Siemens Data Warehouse, a database from the corporations billing system of Bellevue Hospital (New York, N.Y.), was initially conducted to identify all self-reported Hispanic, black, white, Asian, Native American, and other race patients seen at Bellevue Hospital for any medical condition between July of 2000 and August of 2010. From this data set, patients with the diagnosis of Dupuytren's disease were selected by *International Classification of Diseases*,

Ninth Revision code. In addition, patients requiring surgical correction of their disease were found by Current Procedural Terminology code.

The Hispanic patients in this group were then subjected to a chart review and data were collected on the parameters of age, sex, ethnicity, hand dominance, hand affected, and the digits that underwent operative treatment. The following epidemiologic factors were also evaluated: smoking, alcoholism, diabetes mellitus, hypercholesterolemia, epilepsy, and hypertension.

Statistical Analysis

Data were expressed either as mean \pm SD or median and interquartile range. To evaluate the relationship between Dupuytren's disease prevalence or patients requiring surgery and race, chi-square goodness-of-fit tests were used. To determine whether Dupuytren's disease prevalence or patients requiring surgery was significantly different among the six races, Fisher's exact tests were carried out while maintaining a family error rate of $\alpha = 0.05$. To compare epidemiologic factors among patients and those reported in the 2008 National Survey on Drug Use and Health, Wilcoxon rank sum tests and one-proportion z tests were performed, respectively. A one-proportion z test is used to compare a sample proportion to a proportion representative of a population. For all tests, a value of $p < 0.05$ was considered statistically significant.

RESULTS

A total of 2389 patients were assigned a diagnostic code for Dupuytren's disease at Bellevue Hospital between July 12, 2000, and August 10, 2010. Of these, 1177 patients (50.1 percent) were Hispanic, 403 (17.2 percent) were black, 361 (15.4 percent) were white, 197 (8.4 percent) were Asian, seven (0.3 percent) were Native American, and 204 (8.7 percent) were of another race (Table 1).

Table 1. Racial Distribution of Dupuytren's Disease

Race	All Bellevue Patients		Dupuytren's Disease Patients		Dupuytren's Disease Prevalence		Dupuytren's Disease Surgery		Dupuytren's Disease Operative Rate (%)
	No.	%	No.	%	Per 10 ⁵	%	No.	%	
Hispanic	220,748	36.4	1177	50.1	533	0.53	21	51.2	1.8
Black	137,205	22.6	403	17.2	294	0.29	2	4.9	0.5
White	118,909	19.6	361	15.4	304	0.30	15	36.6	4.2
Asian	70,058	11.5	197	8.4	281	0.28	1	2.4	0.5
Native American	2055	0.3	7	0.3	341	0.34	0	0	0
Other	58,144	9.6	204	8.7	351	0.35	2	4.9	1.0
Total	607,119	—	2349	—	—	—	41	—	—

During the same time, a total of 607,119 patients were seen at Bellevue Hospital. Therefore, the overall prevalence of Dupuytren's disease in the study population is 387 per 100,000. Of the 607,119 patients, 220,748 (36.4 percent) were Hispanic; thus, the prevalence in Hispanic patients is 533 per 100,000. The number of black patients was 137,205 (294 per 100,000). The number of white patients was 118,909 (304 per 100,000). The number of Asian patients was 70,058 (281 per 100,000). The number of Native American patients was 2055 (341 per 100,000). The number of other race patients was 58,144 (351 per 100,000).

Of the 2349 patients diagnosed with Dupuytren's disease during the study period, a total of 41 (1.7 percent) required surgical intervention. Of these, 21 (51.2 percent) were Hispanic, two (4.9 percent) were black, 15 (36.6 percent) were white, one (2.4 percent) was Asian, none were Native American, and two (4.9 percent) were of another race. Thus, the percentage of Dupuytren's disease patients requiring surgery was 1.8 percent in Hispanics, 0.5 percent in blacks, 4.2 percent in whites, 0.5 percent in Asians, 0 percent in Native Americans, and 1.0 percent in those of another race.

A chi-square analysis revealed that both Dupuytren's disease prevalence and operative rate were strongly associated with race ($p < 0.001$). On further investigation, disease prevalence in Hispanics was significantly greater than that in the other five races

($p < 0.001$). However, disease prevalence among black, white, Asian, Native American, and other race patients were not significantly different from each other. In addition, the percentage of patients requiring surgery was significantly greater for whites than for the other five races ($p = 0.015$), and was not significantly different among Hispanic, black, Asian, Native American, and other races.

In the Hispanic subgroup of 21 patients, 18 (85.7 percent) were men and three (14.3 percent) were women (Table 2). The age at presentation ranged from 42 to 73 years, with a mean of 59.9 ± 8.2 years. Sixteen of the patients had unilateral disease (76.2 percent) and five had bilateral disease (23.8 percent). Two of the patients with bilateral disease underwent unilateral corrective surgery only. The average age at presentation for patients with unilateral disease was 58.3 ± 8.2 years and that for bilateral disease was 65.0 ± 6.7 years ($p > 0.05$). Nine patients with unilateral disease had left hand involvement (56.3 percent) and seven had right hand involvement (43.8 percent). The dominant hand was affected in 10 patients with unilateral disease (62.5 percent).

The small finger was most commonly affected (71.4 percent), followed by the ring finger (66.7 percent), the long finger (14.3 percent), the thumb (4.8 percent), and the index finger (0 percent). In patients who underwent surgery, the mean metacarpophalangeal joint flexion contrac-

Table 2. Clinical Presentation of Dupuytren's Disease in Hispanics Requiring Surgical Treatment

Patient	Age at Presentation (yr)	Sex	Hand Dominance	Hand Affected	Digits Operated	Comorbidities					
						Alc	CS	DM	Epi	HC	HTN
1	42	M	L	R	R4		✓	✓			
2	48	M	R	R	R5	✓	✓	✓			✓
3	49	M	L	L	L5	✓	✓				
4	54	M	R	L	L5	✓	✓				
5	54	M	R	R	R1, R5	✓	✓				
6	54	M	R	L	L4, L5						✓
7	55	M	R	R	R4			✓			✓
8	56	M	R	R, L	R5, L4, L5	✓					
9	57	M	R	L	L3, L4		✓	✓			✓
10	61	M	R	L	L4	✓	✓				
11	61	M	L	L	L4, L5	✓					✓
12	62	M	L	R, L*	L3	✓	✓				✓
13	64	M	L	R, L*	R4, R5	✓		✓		✓	✓
14	66	M	R	L	L4	✓	✓				
15	68	M	R	L	L4	✓	✓				
16	70	M	R	R, L	R4, R5, L3		✓	✓		✓	✓
17	73	M	R	R	R5			✓		✓	✓
18	73	M	R	R, L	R4, L5		✓	✓		✓	✓
19	62	F	R	R	R5			✓		✓	✓
20	64	F	R	R	R4, R5						
21	65	F	R	R	R4, R5			✓			✓

M, male; F, female; L, left; R, right; CS, cigarette smoker; Alc, alcoholism; DM, diabetes mellitus; HC, hypercholesterolemia; Epi, epilepsy; HTN, hypertension.

*Patients with bilateral disease who underwent unilateral surgery only.

ture was 47.8 ± 25.9 degrees and the mean proximal interphalangeal joint flexion contracture was 42.8 ± 37.6 degrees.

Epidemiologic Factors

The epidemiologic factors evaluated were smoking (57.1 percent), hypertension (57.1 percent), alcoholism (52.4 percent), diabetes mellitus (47.6 percent), hypercholesterolemia (19.0 percent), and epilepsy (0 percent). Overall, the median number of comorbidities was 2 (interquartile range, 2 to 3). The median number of comorbidities was 2 (interquartile range, 2 to 2) for patients with unilateral disease and 3.5 (interquartile range, 3 to 4) for those with bilateral disease. The median number of comorbidities was 2 (interquartile range, 2 to 3) for patients with unilateral disease who had their dominant hand affected and 2 (interquartile range, 2 to 2) for those who had their nondominant hand affected.

The number of comorbidities for patients with bilateral disease was significantly greater than that for those with unilateral disease ($p = 0.009$). However, for patients with unilateral disease, the number of comorbidities for those who had their dominant hand affected was not significantly different from that for those who had their nondominant hand affected.

DISCUSSION

Although its cause remains incompletely understood, Dupuytren's disease is documented to be strongly associated with genetic, geographic, and environmental factors. To provide comprehensive and clinically accurate information to patients, epidemiologic information on disease differences by race is important. Currently, the vast majority of racial studies conducted on Dupuytren's disease have focused on northern European whites in whom the disease is one of the most commonly inherited connective tissue disorders.¹⁵

The prevalence of Dupuytren's disease in the Hispanic population has only been studied once in the literature and was found to be 237 per 100,000.¹⁴ However, our study revealed the disease prevalence in Hispanics to be 533 per 100,000, which was statistically significantly greater than previously reported in the study of Veterans Affairs Hospital patients ($p < 0.001$). The discrepancy in these estimates may be attributable to a unique patient population in the U.S. Department of Veterans Affairs, described as mainly male, poor, and undereducated compared with the general U.S.

population.¹⁴ In contrast, the patient population in our study reflected the especially diverse groups of people in New York City as they presented to Bellevue Hospital.

Several differences between Dupuytren's disease presentation in the Hispanic and white races were identified in this study. Dupuytren's disease most often occurs bilaterally, with one hand being more affected than the other. Hindocha et al.³ conducted a study in a large sample of white patients from northwest England and found that 69.4 percent of patients had bilateral disease. This finding in whites is three-fold higher than that determined by our study on Hispanic subjects (23.8 percent), suggesting that bilateral disease may be less common in Hispanics requiring surgical correction of their Dupuytren's disease than in those of the white population ($p < 0.001$). Moreover, previous studies have reported that the disease most commonly affects the ring finger, followed by the small finger, thumb, and long and index fingers, respectively.¹⁶ However, in our study, the Hispanic patients evaluated showed a different order of digit involvement wherein the small finger was most commonly affected, followed by the ring finger, the long finger, the thumb, and the index finger. Lastly, we determined the operative rate of patients to be twice as high for whites as for Hispanics at 4.2 and 1.8 percent, respectively. Although in theory this difference may suggest that disease progression is less severe in Hispanics than in whites, in practice the decision to proceed with surgery reflects many other factors such as cultural values and surgeon bias for which this study was unable to account.

A number of epidemiologic factors have been associated with the development of Dupuytren's disease. Six of these factors—smoking, alcoholism, diabetes mellitus, hypercholesterolemia, epilepsy, and hypertension—were selected as evaluation parameters on the basis of consistent findings in the literature.^{13,15–20} In patients with Dupuytren's disease, studies have found a 0.3 to 33 percent rate of diabetes mellitus,^{13,17} which is thought to be attributable to the microangiopathy and resulting increased collagen production.¹⁸ In our group of Hispanics who required surgical treatment for their disease, 47.6 percent were diabetics ($p > 0.05$) compared with the upper limit specified above, suggesting that diabetes as a comorbidity in the Hispanic population is not different from that in Caucasians with Dupuytren's disease.

Correlations between Dupuytren's disease and alcohol abuse and cigarette smoking have shown an increased prevalence in patients with these

comorbidities.^{15,19} According to the 2008 National Survey on Drug Use and Health, 4.1 percent of U.S. Hispanics are classified as heavy alcohol users.²¹ However, among the Hispanic patients in our study who required surgical treatment for their disease, the rate of heavy alcohol use (52.4 percent) was increased nearly 13-fold ($p < 0.001$). In smokers, disease prevalence has been found to be three times higher than in nonsmokers, thought to be related to the microvascular changes in the hand that occur with smoking.¹⁶ Also, 21.1 percent of U.S. Hispanics in the National Survey on Drug Use and Health reported cigarette smoking compared with 57.1 percent of those we evaluated ($p < 0.001$). Considered together, these data strongly indicate that alcoholism and smoking are comorbidities more common in Hispanics with Dupuytren's disease than in the general population.

Overall, 57.1 percent of the Hispanic patients who required surgical treatment for Dupuytren's disease suffered from hypertension. Although hypertension is well known to be associated with smoking, 77.8 percent of nonsmokers with Dupuytren's disease had hypertension. This finding supports the notion of hypertension as an independent epidemiologic factor of the disease and, perhaps, may be the mechanism through which smoking leads to its pathophysiologic effects. However, before conclusions may be drawn from this hypothesis, further studies should be conducted to better understand the interplay between hypertension and Dupuytren's disease.

The relationship between Dupuytren's disease prevalence and such factors as epilepsy and anti-convulsants has also been described.²⁰ However, none of the subjects in our study sample who required surgical correction for their disease had been diagnosed with epilepsy.

Although the aforementioned clinical associations demonstrated statistically significant associations with Dupuytren's disease, it is important to note that association does not imply causation. As such, conclusions of causality should not be drawn from these findings alone. In addition, although this study was conducted on a large and diverse patient population, it was confined to a single center. These limitations should be considered when generalizing its results to the larger Hispanic population.

CONCLUSIONS

In this study conducted on a racially diverse patient population in New York City, we determined the prevalence of Dupuytren's disease in Hispanics to be 533 per 100,000, significantly

greater than that found in black (294 per 100,000), white (304 per 100,000), Asian (281 per 100,000), Native American (341 per 100,000), and other (351 per 100,000) races.

Of the Hispanic patients, 1.8 percent required surgery, 85.7 percent were male, and 14.3 percent were female. Age at presentation ranged from 42 to 73 years, with a mean of 59.9 ± 8.2 years. In addition, 76.2 percent had unilateral disease and 23.8 percent had bilateral disease. The small finger was most commonly affected (71.4 percent), followed by the ring finger (66.7 percent), long finger (14.3 percent), and thumb (4.8 percent), and these patients were characterized by the following comorbidities: smoking (57.1 percent), hypertension (57.1 percent), alcoholism (52.4 percent), diabetes mellitus (47.6 percent), and hypercholesterolemia (19.0 percent). Although the epidemiologic factors identified in Hispanics with Dupuytren's disease are similar to those in other races investigated, this article reports important differences with respect to disease prevalence, clinical presentation, and surgical treatment.

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More information on registering clinical trials can be found in the following article: Rohrich RJ, Longaker MT. Registering clinical trials in *Plastic and Reconstructive Surgery*. *Plast Reconstr Surg*. 2007;119:1097-1099.