Relative % Dupuytren prevalence in US citizens
1.0 Non-Hispanic White
0.33 White Hispanic
0.20 Native American
0.18 Black
0.09 Asian

Racial Distribution of Dupuytren's Disease in Department of Veterans Affairs Patients

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Dupuytren's disease is a polyclonal fibroproliferative disorder of the palmar fascia of unclear pathogenesis. It has been described as a disease of northern European men and is reportedly rare in other races. A 10-year retrospective study using the Department of Veterans Affairs computer system was conducted to determine the racial distribution of this disorder among patients treated at all Department of Veterans Affairs medical centers. The study also determined demographic and clinical characteristics of black veterans treated for the condition at department medical centers. There were 9938 patients identified between the fiscal years of 1986 and 1995, of whom 412 were black (estimated prevalence of 130 per 100,000 population), 9071 were white (734 per 100,000), 234 were Hispanic white (237 per 100,000), 11 were Native American (144 per 100,000), 8 were Asian (67 per 100,000), and 202 were of unknown race. The characteristics of the disease in blacks are similar to those in whites. In both groups, the disease has a late onset, affects predominantly the ulnar digits, and is associated with other medical conditions, such as alcoholism, smoking, and diabetes. Unlike Dupuytren's disease in whites, however, the disease is rarely bilateral in blacks. The differential prevalence among racial groups suggests a genetic component to the pathogenesis of the disease. (*Plast. Reconstr. Surg.* 106: 71, 2000.)

Dupuytren's disease is a fibroproliferative disorder of the palmar fascia that can result in disabling contractures of the digits. The pathogenesis is unclear, but the geographic pattern of disease prevalence, familial predilection, and other evidence indicate a genetic cause.[1–3] Alcoholism, smoking, liver failure, epilepsy, and trauma are more prevalent in patients with Dupuytren's disease than would be expected by chance alone, suggesting environmental causation as well.[1,2] It has been suggested that one may inherit a predisposition to the disorder and that environmental factors induce gene expression, leading to phenotypic manifestations.[1] This mechanism has been reported in other disorders.

Both population studies and family studies support a genetic pattern of transmission.[1] Most population studies come from northern Europe and Australia, where the disease is prevalent. It has been asserted that the disease is rare in nonwhite races, but we have found no population study documenting a low prevalence in nonwhites.[1–5] In fact, Egawa et al.[6] found that the prevalence in Japanese men more than 60 years old is 16 percent to 25 percent and that the prevalence in Japanese women in the same age group is 3 percent to 10 percent. These rates are similar to the prevalence of the disease in Norway, England, and Australia[7–9] and contradict the previous assumption that the disorder is uncommon in Asians.

There is little information about this condition in blacks. Mitra and Goldstein[4] reported findings in a series of eight black patients, in whom the disease was frequently bilateral and strongly associated with heavy labor. The main purposes of our study were to identify the racial distribution of Dupuytren's disease in a nonreferral-based population and to document the major clinical characteristics of the condition in blacks. A 10-year (1986 to 1995) retrospective study of patients treated at all Department of Veterans Affairs medical cen-

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ters using the department's supercomputer system allowed us to accomplish both goals.

Materials and Methods

The Department of Veterans Affairs data-processing center in Austin, Texas, consisted of an IBM (Armonk, N.Y.) mainframe computer (model 9021-900) linked with several IBM storage computers during the time frame studied. The facility had the ability to respond to 235 million instructions per second and had 600,000 megabytes of storage capacity. It has steadily increased in sophistication and power and remains the largest data center in the Department of Veterans Affairs. It accommodates payroll, accounting, inventory, supply, and other administrative functions, in addition to maintaining the data set used for this work. Access is limited to those with the requisite programming knowledge and security clearance. The source of information used was the patient treatment file database, which records information about each episode of patient care provided under Department of Veterans Affairs auspices. The patient treatment file database was searched using code 728.6 (International Classification of Diseases–Clinical Modification, ninth edition) for Dupuytren's disease. This search revealed our target population and the facilities where they received treatment. Other data available from the patient treatment file included age, self-reported race, sex, type of surgical treatment, and number of surgical procedures. Histories, information obtained during physical examinations, discharge summaries, operative reports, and pathology reports were then requested on all black patients with Dupuytren's disease. The resulting chart reviews allowed us to verify information obtained from the patient treatment file search and to obtain additional clinical data of interest.

A second search of the Department of Veterans Affairs computer system was performed to identify all veterans, irrespective of diagnosis, who used department health services each year. This information was used to calculate the prevalence of the condition among all veterans treated at department medical centers and to calculate prevalence among veterans of several self-reported racial groups. Age-adjusted prevalence was calculated for black veterans by dividing the total number of black patients with Dupuytren's disease for a given age group by the total number of black patients in that age group.

Results

Between 1986 and 1995, 9938 patients were assigned the diagnostic code for Dupuytren's disease at Department of Veterans Affairs medical centers across the United States. Of these, 9071 (91.3 percent) were self-reported as white, 412 (4.1 percent) as black, 234 (2.4 percent) as Hispanic white, 11 (0.1 percent) as Native American, and 8 (0.08 percent) as Asian; 202 patients (2.0 percent) chose not to report their race. All black patients except one were male.

Approximately 3,243,000 veterans used the Department of Veterans Affairs hospital system in 1998. Thus, the prevalence of Dupuytren's disease in this population is about 306 per 100,000. Of the 3,243,000 patients, approximately 317,700 were black; thus, the prevalence in black patients is about 130 per 100,000. The number of white patients was approximately 1,236,400 (734 per 100,000). The number of Hispanic white patients was approximately 98,650 (237 per 100,000). The number of Asian patients was approximately 11,800 (67 per 100,000). The number of Native American patients was approximately 7600 (144 per 100,000). The self-reported race of approximately 1,570,750 veterans was unknown.

Of the 412 black patients, detailed information was obtained for 136, but not all information requested was available for each patient. Only available data were used to determine clinical characteristics of the disorder in black patients, and our estimates can therefore be considered conservative. Age ranged from 25 to 94 years (mean = 61.6 years), and the modal number of patients (47 percent) was in the 61- to 70-year-old age group. We were able to determine hand involvement in 126 patients. The right hand alone was involved most frequently (47 percent), the left hand alone was involved in 39 percent, and bilateral involvement was seen in 14 percent (Fig. 1). Of the 126 patients, 166 digits were involved. The small finger was the digit most often involved (63 percent), followed by the ring finger (48 percent), long finger (13 percent), thumb (4 percent), and index finger (2 percent) (Fig. 2). Eighty-two patients underwent operations for joint contractures. The proximal interphalangeal joints and the metacarpophalangeal joints were the

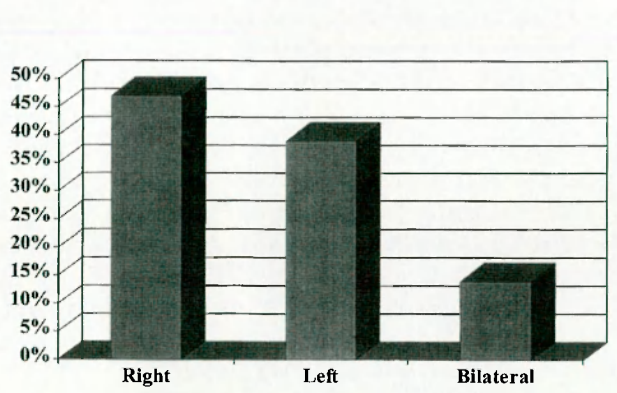

FIG. 1. Hand involvement in black patients with Dupuytren's disease (n = 126).

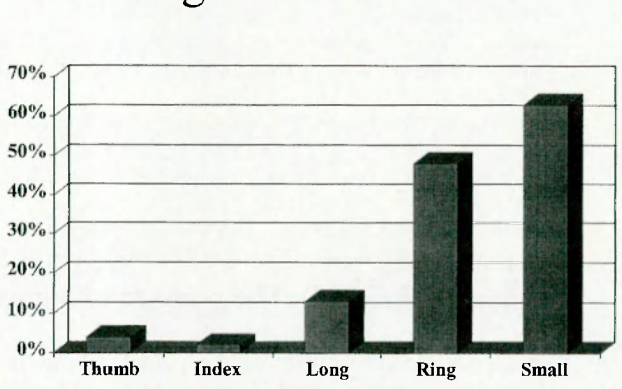

FIG. 2. Digit involvement in black patients with Dupuytren's disease (n = 126). A total of 166 digits were involved.

most frequently released (50 percent and 48 percent, respectively), whereas the distal interphalangeal joint was released in only 2 percent.

Coded associated diseases in the 136 patients included hypertension (in 53 patients, 39 percent), alcohol abuse (46 patients, 34 percent), smoking (30 patients, 22 percent), diabetes (28 patients, 21 percent), seizures (4 patients, 3 percent), and plantar fibromatosis (2 patients, 1 percent). Among the 16 patients who had documented work histories, 37.5 percent of patients were self-described as unemployed at the time of their surgery, 12.5 percent were professionals, and 50 percent were laborers.

DISCUSSION

Most authors believe that genetic factors play a role in the pathogenesis of Dupuytren's disease. There is evidence that the mode of inheritance is autosomal dominant,[10,11] but the evidence in favor of this is weak. One of the strongest arguments for a genetic cause of Dupuytren's disease is that there is such a large variation in the prevalence of the disease across geographic locations.[1] However, we have found few population studies documenting a variable prevalence of Dupuytren's disease among racial groups. The study of Egawa et al.[6] suggested that the prevalence in Asians is comparable to that in whites but presented no concurrent data on whites. The prevalence data in that study were compared with those reported by other authors, but it is unclear whether diagnostic criteria were uniform. The results of our study suggest a substantial racial variance in the prevalence of Dupuytren's disease, supporting a genetic origin.

The Department of Veterans Affairs computer system allows investigators to analyze coded data on a large number of patients from a known population size, so prevalence can be estimated, but there are limitations to the validity and generalizability of the data. The population is generally male, poor, and has a relatively low education level compared with the general population of the United States. The criteria for making the diagnosis were not standardized, but we believe this factor should not markedly affect our conclusions regarding comparative prevalence. The practitioners who made the diagnoses had various levels of experience in hand surgery, which probably also affected the diagnostic threshold. For example, when a physician with "an interest in diabetes" examined a study group, the prevalence of Dupuytren's disease was 18 percent, but when a hand surgeon examined the same patients, the prevalence increased to 40 percent.[12] Most practitioners in the Department of Veterans Affairs system are not hand surgeons, so one may assume that our prevalence rates are quite conservative. Again, however, we believe the comparative prevalence estimates should not be markedly affected.

The lack of standardized reporting criteria and the variability of expertise among practitioners probably affected the data on the clinical characteristics of the disease in blacks. There is also abundant evidence suggesting that coded administrative data have numerous inaccuracies.[13] However, the information about clinical characteristics of the disorder in blacks was verified by chart review, which should have limited the number of inaccuracies.

There is little information about Dupuytren's disease in blacks in the literature. We found only 47 reported cases of the disease in blacks as of 1998.[2–5 14–20] We were able to determine clinically important characteristics in black veterans. In many ways, the disease in blacks is similar to that in whites. In both groups, the disease has a late onset. Mikkelson[8] and Ross[21] report that the prevalence increases in the sixth decade of life in whites; a similar distribution is seen in blacks (Fig. 3). It tends to affect the ulnar side of the hand in both races. In fact, radial-sided disease is rare in blacks, occurring in only 5 percent of cases in this series (4 percent in the thumb and 2 percent in the index finger). Diabetes, epilepsy, smoking, and alcohol abuse have all been associated with the condition in whites, and there seem to be similar associations in blacks. It has been postulated that collagen microtrauma from diabetes, smoking, hand injury, antiepileptic medications, and possibly alcohol either induce the disease or cause clinically minimal disease to become aggressive.[22]

There seems to be one sizable racial difference among afflicted patients. Both Mikkelsen[8] and Yost et al.[23] found that the disease is bilateral in more than 50 percent of cases in whites (59 percent and 53 percent, respectively). We found bilateral disease in only 14 percent of the black patients in our study. However, when the disease was unilateral, the right hand was most often affected in both groups.

Conclusions

This is one of the largest series of patients with Dupuytren's disease ever reported from a nonreferral-based patient population, with the largest number of blacks evaluated to date. The racial distribution among patients who use the Department of Veterans Affairs system provides some of the strongest evidence to date in support of a genetic pathogenesis. Associated diseases described in whites are also prevalent in blacks, leading us to believe that environmental factors play a similar role in the pathogenesis in both racial groups.

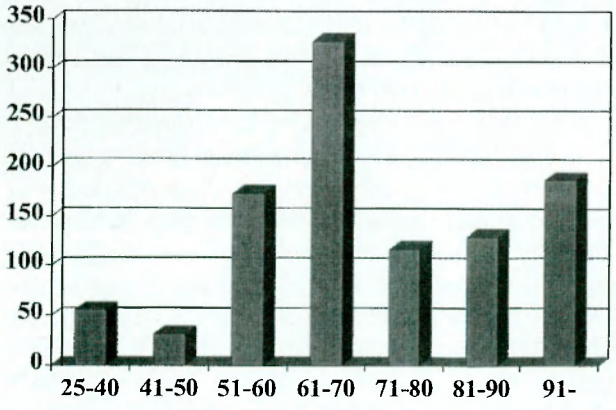

Fig. 3. Age-adjusted prevalence of Dupuytren's disease per 100,000 black veterans (n = 412).

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