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## Dupuytren's disease in bosnia and herzegovina. An epidemiological study

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### Abstract

**Background:** It is generally held that Dupuytren's disease is more common in northern than in southern Europe, but there are very few studies from southern European countries.

**Methods:** We examined the hands of 1207 men and women over the age of 50 years in Bosnia and Herzegovina.

**Results:** The prevalence of Dupuytren's disease was highly age-dependent, ranging from 17% for men between 50–59 years to 60% in the oldest men. The prevalence among women was lower. The great majority only had palmar changes without contracture of the digit. The prevalence was significantly lower among Bosnian Muslim men than among Bosnian Croat and Serbian men and significantly increased among diabetics. No association could be detected between Dupuytren's disease and smoking, alcohol consumption or living in rural or urban areas.

**Conclusion:** We conclude that, contrary to previous opinion, Dupuytren's disease is common in Bosnia and Herzegovina.

### Background

The aetiology of Dupuytren's disease is still unclear. There are indications that diabetes mellitus [1-8], alcohol consumption [4,9,10] and smoking [4,10-12] are risk factors. It is generally agreed that the prevalence is much higher among Europeans than among other races [13-18] and that the prevalence in Europe is higher in Northern than in Mediterranean countries [18]. A fairly high prevalence has, however, been reported in Spain [6]. We have not found other studies from Southern Europe.

The purpose of the present study was to determine the prevalence of Dupuytren's disease in the Southern European country of Bosnia and Herzegovina and to evaluate the prevalence of some of the suggested risk factors

### Methods

An effort was made to survey all the three ethnic groups in Bosnia Herzegovina. The data for the study were collected by the first author in the mainly Serb populated towns of Banja Luka (population 143.079) and Trebinje (30.979), the mainly Moslem populated towns of Tuzla (83.770), Zenica (96.027) and Konjic (13.729) and the Croat and Moslem populated city of Mostar (126.643). In rural areas the survey was undertaken in the mainly Serb populated community of Nevesinje (4.068), mainly Croat, Neum (1.651), Grude (3.598) and Stolac (5.530) and the mainly Moslem Tesanj (5.621) and Jablanica (4.457).

Members of the public were approached at random on the street and in other public places by the first author and asked to take part in the study. The first author is a medical

**Table 1: The number of individuals found with Dupuytren's disease (DD+) in the general population and the age specific prevalence (DD%).**

	Men			Women		
	Total	DD+	DD%	Total	DD+	DD%
50-54	152	26	17	178	20	11
55-59	121	33	27	135	16	12
60-64	98	32	33	91	12	13
65-69	61	21	34	71	10	14
70-74	98	47	48	56	13	23
75-79	40	30	75	32	13	41
80+	40	24	60	34	10	29
<b>Total</b>	<b>610</b>	<b>213</b>	<b>31</b>	<b>597</b>	<b>94</b>	<b>16</b>

student who had received instruction on how to recognize Dupuytren's contracture. The only criterion for approaching someone was that they looked as if they might be over the age of 50 years. Almost everyone approached seemed happy to take part in the study. It was extremely uncommon for anyone to refuse. Those who consented were asked their year of birth and their ethnic background, whether they had had surgery for Dupuytren's disease and whether they suffered from diabetes mellitus ("Do you have sugar?"), smoked tobacco or consumed alcohol. The respondents' hands were then examined for signs of Dupuytren's disease which was graded into three stages: Stage 1 when there were only palpable nodules and skin tethering in the palm and no flexion contracture of the digit, stage 2 when there was less than 90 degrees total contracture of the metacarpo-phalangeal and interphalangeal joints, and stage 3 when there was more than 90 degrees contracture of the digit. The degree of contracture was estimated visually.

The age-specific prevalence among men and women was calculated and also the prevalence for various subgroups.

We also examined the hands of 237 patients at a diabetes clinic. These were in-patients and consecutive patients at the out-patient clinic. Data from these patients were kept separate from those of the main study.

Statistical significance was tested with the Mantel-Haenszel summary chi-square test and the Mantel-Haenszel weighted odds ratios (OR) and Cornfield 95% confidence limits were calculated (Statcalc, Epiinfo 2000, Centers for Disease Control and Prevention, Atlanta, Georgia, USA). P-values lower than 0.05 were taken to indicate statistically significant differences.

## Results

A total of 1287 individuals were interviewed. Of these, 80 (5 with Dupuytren's disease) were excluded because they proved to be under the age of 50 years. Dupuytren's disease was found in the hands of 210 men and 94 women among the 1207 individuals over the age of 50. A stage 2 disease was found in 72 men and 16 women and a stage 3 disease in seven men and one woman. The prevalence was highly age dependent, ranging from 17% for men between 50 and 54 years to 60% in the oldest men (Table 1). The prevalence among women was lower (Table 1).

Dupuytren's disease was detected in a total of 775 finger rays (Table 2). Of these, 608 were without contracture of the digit (stage 1). A total of 16 (2.6%) men and 7 (1.2%) women stated that they had been operated for Dupuytren's disease. In 3 of the men and 2 of the women no typical Dupuytren changes could be detected and it seems possible that they had in fact been operated for other conditions. Changes were equally distributed in the right and left hands in women, while they were found more than three times as often in the right hands as in the left hands of men. The ring and little finger rays were most often affected, and the thumb and index finger rays least often.

The prevalence of Dupuytren's disease was significantly lower among Muslim men than among Serbian and Croatian men ( $p = 0.018$ ; OR 1.61; 95% confidence interval 1.08–2.41). This was not the case for women ( $p = 0.6$ ; OR 1.17; 95% confidence interval 0.71–1.92).

There was no significant difference in the prevalence of Dupuytren's disease between smokers and non-smokers, between those admitting to drinking alcohol and teetotallers, or between those living in urban areas and those living in rural areas. The prevalence was, however, far higher among those who stated that they suffered from

**Table 2: Number of digital rays affected by Dupuytren's disease. (Stage 1: Only palmar changes; Stage 2: Less than 90 degrees contracture of digit; Stage 3: More than 90 degrees contracture of digit.)**

Stage:	Right hand				Left hand			
	1	2	3	All	1	2	3	All
<b>Men</b>								
Thumb	5	0	0	5	2	0	0	2
Index	6	0	0	6	2	0	0	2
Long	45	8	0	53	9	4	0	13
Ring	146	41	3	190	57	8	1	66
Little	90	56	5	151	27	7	1	35
<b>Total</b>	<b>292</b>	<b>105</b>	<b>8</b>	<b>405</b>	<b>97</b>	<b>19</b>	<b>2</b>	<b>118</b>
<b>Women</b>								
Thumb	0	0	0	0	0	0	0	0
Index	0	0	0	0	0	0	0	0
Long	5	2	0	7	15	1	0	16
Ring	59	7	0	66	69	8	0	77
Little	41	6	1	48	30	8	0	38
<b>Total</b>	<b>105</b>	<b>15</b>	<b>1</b>	<b>121</b>	<b>114</b>	<b>17</b>	<b>0</b>	<b>131</b>

**Table 3: The prevalence of Dupuytren's disease (DD%) among Serbian, Croat and Muslim men.**

Age	Serbian			Croat			Muslim		
	Total	DD+	DD%	Total	DD+	DD%	Total	DD+	DD%
<b>50-59</b>	66	16	24	84	25	30	123	18	15
<b>60-69</b>	49	18	37	58	18	31	52	17	33
<b>70-79</b>	54	30	56	50	31	62	34	16	47
<b>80+</b>	16	10	63	14	9	64	10	5	50
<b>All</b>	<b>185</b>	<b>74</b>	<b>35</b>	<b>206</b>	<b>83</b>	<b>33</b>	<b>219</b>	<b>56</b>	<b>25</b>

**Table 4: The prevalence of Dupuytren's disease (DD%) among diabetics and non-diabetics and the prevalence of self-reported diabetes mellitus.**

Men	Diabetics			Non-Diabetics			Diabetes
	Total	DD+	DD%	Total	DD+	DD%	%
<b>50-59</b>	65	24	37	208	35	17	24
<b>60-69</b>	53	24	45	106	29	27	33
<b>70-79</b>	44	32	73	94	42	45	32
<b>80+</b>	9	7	78	31	17	55	23
<b>Women</b>							
<b>50-59</b>	48	14	29	265	22	8	15
<b>60-69</b>	40	8	20	122	14	11	25
<b>70-79</b>	22	10	45	66	16	24	25
<b>80+</b>	11	4	36	23	6	26	32

**Table 5: The number of individuals found with Dupuytren's disease (DD+) at a diabetes clinic and the age specific prevalence.**

	Men			Women		
	Total	DD+	DD%	Total	DD+	DD%
<b>50-59</b>	30	19	63	25	14	56
<b>60-69</b>	48	36	75	36	22	61
<b>70-79</b>	43	34	79	41	24	58
<b>80+</b>	4	3	75	10	4	40
<b>Total</b>	125	92	69	112	64	57

diabetes mellitus (Table 4. Men: p = 0.00000033; OR 2.75; 95% confidence interval 1.83-4.11; women: p = 0.000034; OR 2.79; 95% confidence interval 1.70-4.81). The separate examination of 125 male and 112 female patients at a diabetes clinic show that 92 men and 64 women had Dupuytren's disease (Table 5).

**Discussion**

In 1991 the population of Bosnia and Herzegovina was 44% Muslim, 31% Greek Orthodox Serb, and 17% Roman Catholic Croat. The inhabitants are, however, all descendants of the South-Slavs who migrated into the Balkans in the sixth and seventh centuries A.D. Little attention was paid to ethnic labels until the war of 1992-1995, particularly in the cities where intermarriage had blurred the lines between the groups and religious devoutness was uncommon. After the "ethnic cleansing" of the war the country has been divided into the Federation of Bosnia and Herzegovina, inhabited mainly by Croats and Muslims, and the Serbian Republic with a mainly Serbian population. Rural and urban areas in both parts of Bosnia and Herzegovina were visited in order to obtain a representative sample of the population during the collection of data for this study.

There are considerable differences between studies of the prevalence of Dupuytren's disease in various geographic areas. The highest prevalence has been found in Scandinavia and the British Isles [12,19-23]. Contrary to previous opinion, we found a high prevalence of Dupuytren's contracture in Bosnia and Herzegovina. This is even higher than the reported prevalence in Northern Europe. Most had only palmar changes, and even for those with moderate contracture of the fingers it may not seem worthwhile to seek medical advice in this relatively poor country which now, furthermore, has a health-care system in crisis after the war. It seems possible that factors such as these may explain why the prevalence has been perceived to be low up to now.

The manner of sampling the population in this study is not ideal. Hardly anyone refused to participate in the study but groups such as the incarcerated and the bedridden are obviously not included. It seems unlikely that this has influenced the findings materially, and we were unable to devise a better sampling method in a country in which detailed demographic data to a great extent are lacking. Even so, it seems probable that our study comes closer to revealing the true prevalence than the occasional anecdotal reports of orthopaedic and plastic surgeons, which have been the basis of the present view. It is sometimes difficult to distinguish Dupuytren's disease from other pathology in the hand, but this is true also for the other population based epidemiological studies that have been reported.

A predilection for the right hand has also been reported by others [20]. Furthermore, Mikkelsen and co-workers [24] and Gudmundsson et al [25] have found an increased death rate among individuals with Dupuytren's disease, and this, together with the high prevalence of diabetes mellitus, may explain the lower prevalence of Dupuytren's disease among the oldest individuals in our study.

Ethnic differences in the prevalence of Dupuytren's disease have been documented [13-18,23]. However, as there are no true ethnic differences between the populations of Bosnia and Herzegovina, only religious and social differences, it is surprising to find lower prevalence among Bosnian Muslim than Bosnian Serb and Croat men. It is possible that this is a spurious finding, particularly as no such difference was found among women, but it may also be due to some, as yet undetermined, difference in social factors.

Some studies have shown a correlation between smoking habits and Dupuytren's disease [4,10-12]. This was not found by Bergenudd et al [21], or in the present study.

Many studies report a relationship between alcohol consumption and Dupuytren's disease [4,9,10]. In the present

investigation, as in some other reports [6,21,26,27], no significant correlation could be found.

Diabetes mellitus has been related to Dupuytren's disease in numerous reports [1-4,7,8] as it is in the present study. In the main material the diagnoses of diabetes mellitus is self-reported and therefore open to question. The diagnosis of diabetes is not in doubt in the separate data from a diabetic clinic, and the prevalence of Dupuytren's disease among these patients was even higher than among the self-reported diabetics. The prevalence of diabetes mellitus seems extremely high in the population we have studied, but we do not know of figures for self-reported diabetes in other populations.

### Conclusions

Contrary to previous opinion, we find that Dupuytren's disease is common in Bosnia and Herzegovina. The prevalence is highly age-dependent, and is strongly associated with diabetes mellitus. Other suggested risk factors such as smoking and alcohol consumption appear to be less important in this population.

### Competing interests

None declared.

### Authors' contributions

DZ collected the data, assisted in the data analysis and read and approved the manuscript. VF conceived of the study, analysed the data and wrote the manuscript.

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