Dupuytren's Contracture, Alcohol Consumption, and Chronic Liver Disease

Pierre Attali, MD; Olivier Ink, MD; Gilles Pelletier, MD; Christian Vernier, MD; François Jean, MD; Lawrence Moulton, MD; Jean-Pierre Etienne, MD

• This prospective study was undertaken to assess the prevalence of Dupuytren's contracture (DC) and its relationship with possible causes, especially alcohol consumption and chronic liver disease. Four hundred thirty-two consecutively hospitalized patients were examined for evidence of DC. They were divided into five groups based on the following clinical, biologic, and histologic criteria: alcoholic cirrhosis (89 patients), noncirrhotic alcoholic liver disease (55 patients), chronic alcoholism without liver disease (46 patients), nonalcoholic chronic liver disease (68 patients), and a control group (174 patients). The prevalence of DC in these five groups of patients was 32.5%, 22%, 28%, 6%, and 12%, respectively; the prevalence of DC was higher in patients with cirrhotic or noncirrhotic alcoholic liver disease (25.5%) than it was in patients with nonalcoholic liver disease (6%), but it was not significantly different in alcoholic patients with or without liver disease. The relationship between DC and age, sex, manual labor, previous hand injuries, diabetes mellitus, alcohol consumption, and cigarette smoking was assessed by univariate and logistic regression methods. Nine variables were significantly different in patients with or without DC: age, sex, manual labor, previous hand injuries, diabetes mellitus, daily alcohol consumption, duration of alcohol consumption, total alcohol consumption, and duration of cigarette smoking. In our patients, variables that could explain DC were, in decreasing order, age, total alcohol consumption, sex (male), and previous hand injuries. In alcoholic patients, these variables were age and previous hand injuries; in nonalcoholic patients, these variables were age and cigarette smoking. These results emphasize the high prevalence of DC in alcoholic patients and the absence of a correlation between DC and chronic liver disease. Age and alcohol consumption are the best explanatory variables of DC in hospitalized patients.

(*Arch Intern Med* 1987;147:1065-1067)

Dupuytren's contracture (DC) is usually related to chronic alcoholism,[1-3] but it has been associated with other diverse causes, such as manual labor,[4] previous hand injuries,[4,5] diabetes mellitus,[6-8] epilepsy,[9-10] and cirrhosis.[2,3,11] Moreover, it has been suggested that DC is related to chronic liver disease and not to long-term alcohol consumption.[12] However, all of these studies investigated only one or two of these diseases, and identification of possible causes (or associations) of DC was never established (to our knowledge) using multivariate methods. The present study was undertaken to assess the prevalence of DC and its relationship with possible causes, especially alcohol consumption and chronic liver disease.

PATIENTS AND METHODS

Four hundred thirty-two consecutive patients (246 male patients and 186 female patients), average age, 54 ± 18 years (range, 16 to 98 years) who were hospitalized in the gastroenterology unit were included in our study. No patient was admitted to the unit for treatment of DC. Patients were considered to be alcoholic when their daily alcohol consumption was greater than 80 g for more than ten years and/or when they had a mean corpuscular volume greater than 98 μm^3 (98 fL) and γ-glutamyl transferase level greater than twice the upper limit of normal.[13-14] One hundred ninety patients were alcoholics. Of these, 89 patients had histologically proved alcoholic cirrhosis, and 55 patients had noncirrhotic alcoholic liver disease; these patients had neither clinical nor biological signs of cirrhosis, and their aspartate aminotransferase levels were greater than twice the normal level.

A liver biopsy specimen was obtained from 30 of these patients. Forty-six patients had chronic alcoholism without clinical or biologic signs of liver disease. A liver biopsy specimen was obtained from none of these patients. Two hundred forty-two patients were nonalcoholics. Of these, 68 patients had histologically proved chronic nonalcoholic liver disease, 19 patients had chronic hepatitis, 46 patients had cirrhosis (21 cases of viral origin, four cases of primary biliary cirrhosis, three cases of "autoimmune" active cirrhosis, three cases of Wilson's disease, two cases of hemochromatosis, two cases of drug-induced cirrhosis [α-methyldopa and ticrynafen use], and 11 cases of cryptogenic origin), and three patients had miscellaneous liver diseases. The control group included 174 patients without alcoholism or chronic liver disease.

Patients were examined for evidence of DC, and its location was noted. Three grades of hand deformity were recognized: grade 1, thickened nodules and bands; grade 2, overall contracture from 1° to 45°; and grade 3, overall contracture greater than 45°. Severity of DC was scored by adding the grades from both hands; thus, DC was considered mild when the score was 1, moderate when the

Accepted for publication Feb 23, 1987.

From the Service des Maladies du Foie et de L'Appareil Digestif, Hôpital de Bicêtre (France) (Drs Attali, Ink, Pelletier, Vernier, Jean, and Etienne) and Unité Inserm 287 et Departement de Statistique Médicale, Institut Gustave Roussy, Villejuif, France (Dr Moulton). Dr Moulton is now with the Department of Biostatistics, The Johns Hopkins University, Baltimore.

Reprint requests to Service des Maladies du Foie et de L'Appareil Digestif, Hôpital de Bicêtre, 78 rue du Général Leclerc, 94270 Kremlin Bicêtre, France (Dr Attali).

Table 1.—Comparison of Clinical Data*

Data	Alcoholic Cirrhosis (n=89)	Noncirrhotic Alcoholic Liver Disease (n=55)	Chronic Alcoholism (n=46)	Chronic Nonalcoholic Liver Disease (n=68)	Control Subjects (n=174)
Age, y	52.3±10.5	45.9±10.5	48.6±12.9	53.2±17.2	58.9±22.7
Sex, M, %	62	78	87	45.5	44
Presence of Dupuytren's contracture, %	28	22	32.5	6	12.5
Engaged in manual labor, %	53	60	61	37	36
Previous hand injuries, %	15	9	26	3	8
Diabetes mellitus, %	12.5	7.5	2	7.5	8.2
Daily alcohol consumption, g/d	130±68	154±99	144±86	10±18	16±28
Duration of alcohol consumption, y	25.4±11.1	21.1±10.6	21±13.6	32.2±10.5	35.1±18.5
Total alcohol consumption, g×y	3263±2141	3203±2530	2834±2339	294±525	501±883
Cigarette smoking, No./d	14±17	21±16	21±14	5±10	9±13
Duration of cigarette smoking, y	27.4±11	23.8±11	26.3±12.3	21.2±11.6	25.5±17.9

*Results are expressed as means±SDs.

Table 2.—Comparison of Clinical Data in Patients With and Without Dupuytren's Contracture*

Data	Patients	
	With DC	Without DC
Age, y	62.2±14.1†	52±18.4
Sex, M, %	75.5†	53
Engaged in manual labor, %	63‡	42
Previous hand injuries, %	19‡	9
Diabetes mellitus, %	14‡	7
Daily alcohol consumption, g/d	103±84†	62±84
Duration of alcohol consumption, y	31.5±14‡	25.5±15
Total alcohol consumption, g×y	2955±2464†	1339±1919
Cigarette smoking, No./d	14±5	12±5
Duration of cigarette smoking, y	33±13.5§	23±13

*Results are expressed as means±SDs. DC indicates Dupuytren's contracture.
†$P<.001$.
‡$P<.01$.
§$P<.05$.

Table 3.—Comparison of Clinical Data in Control Subjects With and Without Dupuytren's Contracture*

Data	Control Subjects	
	With DC	Without DC
Age, y	76±9†	56.5±23
Sex, M, %	54.5†	43
Engaged in manual labor, %	54.5‡	33
Previous hand injuries, %	45§	8.5
Diabetes mellitus, %	23‡	7
Daily alcohol consumption, g/d	29.5±28.5‡	14.5±28
Duration of alcohol consumption, y	25±24‡	14±20
Total alcohol consumption, g×y	1033±1091‡	427±2618
Cigarette smoking, No./d	11±15	8±13
Duration of cigarette smoking, y	41±14§	22.5±17

*Results are expressed as means±SDs. DC indicates Dupuytren's contracture.
†$P<.001$.
‡$P<.05$.
§$P<.01$.

score was 2, and severe when the score was greater than 2.

Effort expended in manual labor was classified by the following four categories: no, little, moderate, and heavy. Dominant handedness, previous hand injuries, and epilepsy were noted. Daily alcohol consumption and cigarette smoking habits, and the duration of each, were determined. Total alcohol consumption was defined as daily alcohol consumption times duration of alcohol consumption. Diabetes mellitus was diagnosed using international criteria.[15]

Patients with DC were compared with patients without DC. Qualitative variables were compared utilizing the χ^2 test. Quantitative variables were compared using Student's t test. The Kruskall-Wallis test was used for nonparametric data. Data were expressed as means±SDs. To assess which variables could explain the presence of DC, a logistic regression method was utilized using the computer program PIGAS[16]. The following variables were evaluated: age, sex, manual labor, previous hand injuries, diabetes mellitus, daily alcohol consumption, duration of alcohol consumption, total alcohol consumption, cigarette smoking and its duration, and presence of chronic liver disease. Epilepsy was not evaluated as only eight patients were epileptic. P values $<.05$ were considered significant.

RESULTS

Clinical data obtained from five groups of patients are presented in Table 1. Among 432 patients, 78 (18%) had DC; of these, 52 patients (67%) were alcoholics, four patients (5%) had chronic nonalcoholic liver disease, and 22 patients (28%) were control subjects.

Dupuytren's contracture was present in 52 (27.5%) of 190 alcoholic patients. The prevalence of DC was not significantly different in alcoholic patients with or without liver disease, ie, 25 (28%) of 89 cirrhotic patients, 12 (22%) of 55 patients with noncirrhotic alcoholic liver disease, and 15 (32.5%) of 46 patients without liver disease had DC. Among nonalcoholic patients, 4 (6%) of 68 patients with liver disease and 22 (12%) of 174 control subjects had DC. This difference was not significant.

Among 212 patients (144 alcoholics and 68 nonalcoholics) with chronic liver disease, 41 patients had DC, and 37 of these patients were alcoholics. Thus, the prevalence of DC was higher in alcoholic patients (25.5% [37/144]) than in nonalcoholic patients (6% [4/68], $P<.001$). Age and adjustment for cirrhosis did not affect these results. Therefore, the positive and negative predictive values of DC for the diagnosis of alcoholic liver disease were 90.2% and 37.5%, respectively.

Patients with DC were compared with those without DC. The nine variables that were significantly different between these patients are listed in Table 2. Adjustment for age did not affect the results, except for duration of cigarette smoking. There was no relationship between the location of DC and the variables studied. In all patients, logistic regression analysis showed four predictive variables of DC: age ($P<.001$), total alcohol consumption ($P<.001$), gender (male) ($P<.02$; relative risk [RR], 1.61) and history of previous hand injuries ($P<.02$; RR, 1.19). Severity of DC was only correlated with total alcohol consumption ($P<.001$).

Comparison between alcoholic patients with and without DC showed that alcoholic patients with DC were older (57 ± 12.5 years of age vs 47 ± 9.5 years of age, $P<.001$) and had a history of frequent hand injuries (27% vs 11.5%, $P<.01$) than did alcoholic patients without DC. Logistic regression analysis showed that age ($P<.001$) and previous hand injuries ($P<.02$; RR, 1.13) were the two predictive variables of DC in alcoholic patients. In these patients, severity of DC was correlated with total alcohol consumption ($P<.02$) and presence of cirrhosis ($P<.02$).

The comparison of clinical data in control subjects with and without DC are presented in Table 3. Predictive variables of DC were age ($P<.01$) and history of cigarette smoking ($P<.01$). Severity of DC was correlated with a history of cigarette smoking ($P<.05$).

COMMENT

Our study confirms the high prevalence of DC in alcoholic patients[1-3,17] and shows that DC is not correlated with chronic liver disease as has been suggested.[12] Indeed, in alcoholic patients the prevalence of DC was not significantly different between patients with or without liver disease. Moreover, in nonalcoholic patients there was no difference in the prevalence of DC between patients with or without chronic liver disease.

The presence of DC in patients with chronic liver disease argues for its alcoholic origins as 37 of 41 patients with DC and chronic liver disease were alcoholics (positive predictive value, 90.2%). However, it must be emphasized that the absence of DC can not exclude the diagnosis of alcoholic liver disease, as 107 (62.5%) of 171 patients with chronic liver disease and without DC were alcoholics.

Our study confirms the association between DC and such diverse causes as manual labor, previous hand injuries, diabetes mellitus, alcohol consumption, and cigarette smoking. An association between DC and epilepsy could not be evaluated because of the small number of patients (eight in our sample) with epilepsy. The logistic regression method was utilized to assess the combined effects of these several causes of DC and to identify the best explanatory variables. We showed that age, total alcohol consumption, male gender, and previous hand injuries were the only variables that could explain the presence of DC. The role of gender and previous hand injuries as causal factors is probably slight because their RR values are low (1.61 and 1.19, respectively). Therefore, the main variables that could explain the presence of DC are age and total alcohol consumption. The role of alcohol consumption in the development of DC is emphasized by the positive correlation between the severity of DC and total alcohol consumption. The logistic regression analysis led us to exclude the role of manual labor, diabetes mellitus, and chronic liver disease in the development of DC.

In three groups of alcoholic patients, logistic regression analysis only identified age and previous hand injuries as the causal factors of DC, but the low RR values (1.13) for previous hand injuries must be emphasized. In these patients, there was no correlation between alcohol consumption and the presence of DC; that surprising result is probably explained by the high alcohol consumption of all of these patients. However, the role of alcohol consumption is emphasized by the positive correlation between the severity of DC and total alcohol consumption.

In nonalcoholic patients, DC was correlated with age and cigarette smoking, and the severity of DC was also correlated with cigarette smoking. The role of cigarette smoking is uncertain[18,19] and needs further evaluation.

The authors thank Nina Bandou for her secretarial assistance.

References

1. Pojer J, Radivojevic M, Williams F: Dupuytren's disease: Its association with abnormal liver function in alcoholism and epilepsy. *Arch Intern Med* 1972;129:561-566.

2. Su CK, Patek AJ: Dupuytren's contracture: Its association with alcoholism and cirrhosis. *Arch Intern Med* 1970;126:278-281.

3. Wolfe SJ, Summerskill WHJ, Davidson CS: Thickening and contraction of the palmar fascia (Dupuytren's contracture) associated with alcoholism and hepatic cirrhosis. *N Engl J Med* 1956;255:559-563.

4. Mikkelsen OA: Dupuytren's disease: The influence of occupation and previous hand injury. *Hand* 1978;10:1-8.

5. MacKenney RP: A population study of Dupuytren's contracture. *Hand* 1983;15:155-161.

6. Lawson PM, Maneschi F, Kohner EM: The relationship of hand abnormalities to diabetes and retinopathy. *Diabetes Care* 1983;6:140-143.

7. Ravid M, Dinai Y, Sohar E: Dupuytren's disease in diabetes mellitus. *Acta Diabetol Lat* 1977;14:170-174.

8. Revach M, Cabilli C: Dupuytren's contracture and diabetes mellitus. *Isr J Med Sci* 1972;8:774-775.

9. Critchley EMR, Vakil SD, Hayward HW, et al: Dupuytren's disease in epilepsy: Result of prolonged administration of anticonvulsants. *J Neurol Neurosurg Psychiatry* 1976;39:498-503.

10. Lund M: Dupuytren's contracture and epilepsy. *Acta Psychiatr Scand* 1941;16:465-492.

11. Nazari B: Dupuytren's contracture associated with liver disease. *J Mount Sinai Hosp NY* 1966;33:69-72.

12. Houghton S, Holdstock G, Cockerell R, et al: Dupuytren's contracture, chronic liver disease, and IgA immune complexes. *Liver* 1983;3:220-224.

13. Papoz L, Warnet JM, Pequignot G, et al: Alcohol consumption in a healthy population: Relationship to γ-glutamyl transferase activity and mean corpuscular volume. *JAMA* 1981;245:1748-1751.

14. Chick J, Kreitman N, Plant M: Mean cell volume and γ-glutamyl transpeptidase as marker of drinking in working men. *Lancet* 1981;1:1249-1251.

15. World Health Organization: Diabetes mellitus, in *Report of an Expert Committee*. New York, World Health Organization, 1985, vol 727.

16. Wartelle M, Kramar A, Jean Z, et al: PIGAS: An interactive statistical data base management system. Proceedings of the Second International Workshop on Statistical Data Base Management, Los Altos, Calif, Sept 29, 1983.

17. Pojer J, Jedlickova J: Enzymatic pattern of liver injury in Dupuytren's contracture. *Acta Med Scand* 1970;187:101-104.

18. Fraser-Moodie A: Dupuytren's contracture and cigarette smoking. *Br J Plast Surg* 1976;29:214-215.

19. Hackett MEJ: The use of thermography in the assessment of depth of burn and blood supply of flaps with preliminary reports in Dupuytren's contracture and treatment of varicose ulcers. *Br J Plast Surg* 1974;27:311.