

Dupuytren's contracture and alcohol

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SUMMARY Reported alcohol consumption was quantified and scored by a validated questionnaire administered by an interviewer to 64 patients (10 female) with Dupuytren's contracture (DC) before hand surgery and to 89 controls (44 female) admitted for other hand or foot surgery. Serum urate (SUA), γ -glutamyl transferase (GGT), and mean red cell volume (MCV) were measured on admission. Thirteen of 54 men with DC reported current daily alcohol intake of 40 g or more compared with one of 45 male controls ($p=0.0001$). Two of 10 women with DC (but none of 44 controls) admitted consuming at least 40 g alcohol daily ($p=0.03$). MCV was higher in men (but not women) with DC than in controls ($p<0.0005$). Current alcohol consumption score of patients with DC correlated with SUA ($r=0.308$, $p<0.05$), MCV ($r=0.44$, $p<0.01$), and GGT ($r=0.54$, $p<<0.001$) on admission. DC among men is strongly associated with heavy drinking, reflected both in self reporting and haematological data.

Key words: alcohol drinking, erythrocyte indices.

The aetiological factors in Dupuytren's contracture (DC) are uncertain, though genetic, sexual, and racial influences can be implicated to explain its predominance in Caucasian males with a family history of DC.¹ Links between alcohol consumption and DC have long been recognised.¹⁻⁷ Alcoholic cirrhotics have DC significantly more often than non-cirrhotic controls,² but the frequency of DC in men who are heavy drinkers does not depend on the presence of cirrhosis.⁵ Some degree of liver damage, however, is probably required for the development of DC in heavy drinkers; liver function tests are more often abnormal in heavy drinkers with DC than in those without.⁶ Despite this apparent relationship alcohol intake among patients with DC has been little quantified,⁸ and never using validated modern methods in a British population. We have compared reported alcohol consumption and the alcohol related haematological and biochemical variables serum urate (SUA),⁹ mean cell volume (MCV),¹⁰ and γ -glutamyl transferase (GGT)¹¹ in a group of DC patients requiring surgery and in controls.

Patients and methods

Sixty four consecutive DC patients (10 female)

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admitted by five consultants to a single orthopaedic unit for fasciectomy or finger amputation were studied. Mean age of DC patients was 62 years (SD 11.2) for males and 63 years (SD 17.7) for females. The indication for surgery was a positive 'table top test'¹² or gross flexion deformity of the interphalangeal joints of the fifth finger, with hyperextension at the metacarpophalangeal joint. No assessment was made of the severity of the DC¹³ or of conditions associated with DC such as Peyronie's disease, plantar fascial thickening, or knuckle pads.¹² Eighty nine control subjects (44 females) from the same general population who formed the basis for an earlier survey of alcohol related orthopaedic problems¹⁴ had been electively admitted to the same unit for other surgery to hands or feet, including nail bed ablation, Keller's operation, and toe straightening procedures. Mean age of controls was 59.8 years (SD 11.2) for men and 64.3 years (SD 9.2) for women.

All patients and controls completed a validated questionnaire administered by an interviewer to provide details of quantity and frequency (QF) of past and present alcohol consumption. The questionnaire was developed in conjunction with the Oxford University Departments of Community Medicine and Psychiatry. A score was allocated on a scale 1–9 depending on alcohol intake;¹⁴ for example, a score of 1 represented consumption of less than one drink per month and a score of 9 more than

100 drinks per week, where a 'drink' is equivalent to a measure of spirits, a glass of wine or sherry, or a half pint of beer (all approximately 10 g alcohol). Patients and controls with current or maximal lifetime consumption of 40 g alcohol or more daily (equivalent to a QF score of 7 or higher) were considered to be heavy drinkers. (Maximal lifetime consumption = maximum daily alcohol consumption for five or more consecutive years of the subject's life over the age of 30, i.e., the highest sustained daily alcohol intake in a subject's adult life.) This level of consumption was chosen as a threshold for heavy drinking because, being slightly lower than most estimates of the daily amount of alcohol required to cause organic damage,¹⁵ it allows for likely under-reporting of consumption by patients and controls in this study. SUA, GGT, and MCV were measured by standard methods¹⁴ in patients with DC and in controls on the morning of admission. DC patients were asked whether they were diabetic, anticonvulsant takers, or whether parents or siblings had DC.

STATISTICS

The χ^2 test, Fisher's exact test, *t* test, Mann-Whitney U test, and product-moment correlation coefficients were used where appropriate.

Results

REPORTED ALCOHOL CONSUMPTION

Thirteen of 54 male DC patients reported current daily alcohol intake of 40 g or more compared with one of 45 male controls ($p=0.0001$) (relative risk 13.95). Two of 10 female DC patients (but none of 44 female controls) were consuming 40 g alcohol or more daily ($p=0.03$) (Fisher's exact test). Twenty eight of 54 male patients (and 13 of 45 controls) had a maximal lifetime alcohol consumption of 40 g alcohol or more daily ($p<0.05$). Two of 10 DC women (and two of 44 controls) had maximal lifetime alcohol consumption of 40 g or more daily (NS).

Liver damage due to alcohol occurs at lower levels of consumption in women than in men¹⁶ so additional comparison was made between alcohol consumption of DC subjects and controls at a threshold of 20 g alcohol daily. At this level there were no significant differences in reported consumption between male and female DC subjects and controls.

SUA, GGT, AND MCV ON ADMISSION (Table 1) MCV on admission in male DC patients was much greater than in controls; however, the difference in MCV between female patients and controls was not significant. Admission MCV was 95 fl or higher in 12

Table 1 SUA, GGT, and MCV on admission

	DC patients		Controls	
	Male	Female	Male	Female
SUA ($\mu\text{mol/l}$)†	n=48	n=7	n=37	n=37
Mean (SD)	365 (84)	307 (107)	368 (88)	305 (83)
MCV (fl)	n=43	n=9	n=29	n=40
Mean (SD)	94.2 (4.7)	90.4 (4.2)	88.5 (5)*	88.3 (3.6)
GGT (IU/l)	n=40		n=78	
	Median 17		Median 21.5	
	Range 6-151		Range 5-196	

* $p<0.0005$ compared with male DC.

†SI conversion: SUA $\mu\text{mol/l} \times 0.01681 = \text{mg/l}$.

of 43 male DC patients compared with two of 29 controls ($p=0.001$). Seven of these 12 male DC patients reported current or past alcohol consumption of 40 g or more daily. One was additionally on anticonvulsant therapy and four had MCVs of just 95 fl. Only one man with a significantly raised MCV denied past or present alcohol consumption of 40 g or more daily. SUA and GGT did not differ significantly between the diagnostic/sex groups, but all DC subjects with GGT 30 IU/l or higher reported current or past alcohol consumption of 40 g or more daily.

CORRELATIONS BETWEEN ALCOHOL INTAKE AND LABORATORY VALUES IN DC PATIENTS (Table 2)

Correlations for these variables were assessed for both male and female DC patients together. MCV, and particularly GGT, correlated well with current QF score. Correlation between SUA and current QF score was weak. We have previously reported lack of correlation between these variables in this control group.¹⁴

PRESENCE OF OTHER FACTORS ASSOCIATED WITH DC

Fifteen patients (six female) described DC in a sibling or parent. Ten patients had a history both of heavy drinking and of a relative with DC. Four patients took anticonvulsants (two had an MCV above 95 fl) and another two patients were insulin dependent diabetics.

Table 2 Correlation between reported current alcohol consumption (QF score) SUA, MCV and GGT in DC subjects

SUA (n=55)	r=0.308	p<0.05
MCV (n=52)	r=0.435	p<0.01
GGT (n=40)	r=0.543	p<<0.001

Discussion

Although this study shows a strong association between current heavy drinking and DC in men, alcohol cannot strictly be proved to be a cause or precipitant of DC without matching the occupations, leisure activities, and social class of patients and controls. Nevertheless, the possibility of an aetiological role for alcohol in DC is strengthened by the failure of previous studies to confirm an association between DC and occupation^{17 18} and between alcohol consumption and social class.¹⁹

The less impressive difference in previous consumption of male DC patients and controls may be due to inaccurate recall of past alcohol consumption. There is no reason to suspect that sustained heavy drinking is an effect of DC. The relatively small number of female DC patients may have blunted the significance of differences between their reported alcohol consumption and that of controls; alternatively, women may consistently under-report their alcohol intake or factors other than alcohol may be more strongly associated with DC in women.²⁰ Our results do not suggest that DC in women is associated with alcohol consumption levels lower than those in men.

This study probably underestimated alcohol consumption in both DC patients and controls because under-reporting of alcohol consumption in studies of this type is common.^{21 22} The degree of under-reporting, however, is likely to be constant in both groups. Alcohol consumption among the population at large with DC may also be much higher because some may not have reached surgery through unfitness associated with alcohol abuse. Conversely, it is conceivable that some DC patients were aware, through discussions with medical advisers or through 'home research', of known links between alcohol and DC. These patients (but not the controls) might have been influenced by this knowledge to exaggerate their reported alcohol consumption. We think this unlikely because no patient reported knowledge of links between DC and alcohol when the purpose of the study was explained to them.

A frequent coexistence of a positive family history and high alcohol consumption in this study suggests the possibility of some synergism between alcohol and a genetic predisposition in causing the expression of DC.^{5 7} However, both alcohol and a positive family history are common in DC patients: the association may thus simply be coincidence.

The higher MCV among DC males is largely due to alcohol, with anticonvulsant usage having a minor role. The lack of difference in GGT between DC males and controls is, however, surprising in the

light of the very significant correlation between current QF score and GGT, and the high reported alcohol consumption of DC males compared with controls. A possible explanation is that some DC subjects have macrocytosis due to dietary folate deficiency²³ associated with alcohol consumption which is not heavy enough to cause liver damage and increase in GGT.

The correlation between current alcohol consumption score, MCV, and GGT in the DC subjects is in contrast with the lack of correlation between these variables in our controls shown previously.¹⁴

Clearly, MCV and GGT correlate with reported alcohol consumption only in heavier drinkers; indeed in the absence of other causes an individual with an MCV greater than 98 fl and a GGT over 50 IU/l has a better than 66% probability of consuming more than 80 g alcohol daily.²⁴ In the present study it is noteworthy that in only one case did a raised MCV identify a DC subject who denied heavy drinking; as we have shown previously,¹⁴ self reports prove generally to be more sensitive than MCV or GGT, or both, at reflecting heavy drinking.

This study thus confirms clinically and haematologically that DC in men is associated with heavy drinking. However, if alcohol precipitates DC the mechanisms by which it might do so are unknown. The increase in palmar collagen in DC represents a repair phenomenon;²⁵ Rabinowitz *et al*²⁶ have shown an alteration in the composition of palmar fat of DC patients. They propose that alcohol alters both palmar and liver fat composition by a hypoxic mechanism; the altered fat could serve as an irritant, precipitating a fibrotic repair response in both liver and palmar fascia (Francis MJO, personal communication). These mechanisms remain speculative but provide an interesting basis for further research into DC.

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