

## SHORT REPORTS

### Limited joint mobility and Dupuytren's contracture in diabetic, hypertensive, and normal populations

Limited joint mobility in diabetic hands is obvious when severe, while more subtle abnormalities are defined as the inability to extend to 180° the metacarpophalangeal or interphalangeal joints of at least one finger bilaterally.<sup>1</sup> The prevalence in young diabetics is 18-30%<sup>1-3</sup> compared with less than 5% in controls, and limited joint mobility is associated with an increased incidence of microangiopathy.<sup>1,3</sup>

To examine the possibility that limited joint mobility might represent an accelerated aging process associated with microangiopathy its prevalence was assessed in normal, diabetic, and hypertensive subjects, the last group being exposed to an alternative cause of vascular disease. Dupuytren's contracture, which also occurs more frequently in diabetics,<sup>4</sup> was also assessed.

#### Subjects, methods, and results

The 168 diabetics (80 men) and 114 hypertensive patients (57 men) were recruited from the diabetic and hypertension clinics of Gartnavel General Hospital and the Western Infirmary, Glasgow. One hundred healthy subjects (34 men) were recruited from friends and relatives of the patients. The mean ages of the groups were 52, 55, and 51 years respectively.

Limited joint mobility was determined using the modified fanned hand to hand method.<sup>1</sup> Dupuytren's contracture<sup>4</sup> in either hand was recorded as a positive finding. The presence or absence of retinopathy was recorded, with no differentiation between background and proliferative retinopathy. Statistical analysis was by  $\chi^2$  test and the Mann-Whitney U test.

The table shows the prevalences of limited joint mobility and Dupuytren's contracture in the three groups. The apparently increased prevalence of Dupuytren's contracture in diabetic women and hypertensive men compared with controls of the same sex did not achieve statistical significance ( $0.05 < p < 0.1$ ). Limited joint mobility was associated directly with age in controls of both sexes ( $p < 0.01$ ), diabetic women ( $p < 0.0005$ ), and men with hypertension ( $p < 0.05$ ). Dupuytren's contracture was significantly associated with age in all groups (diabetics  $p < 0.0005$ ; others  $p < 0.01$ ) except in the male controls. In women with diabetes both limited joint mobility and Dupuytren's contracture were also associated with duration of disease ( $p < 0.01$ ).

In the diabetic women retinopathy was associated both with limited joint mobility ( $p < 0.05$ ) and, more strongly, with Dupuytren's contracture ( $p < 0.0001$ ) but no significant association was shown in the men with diabetes ( $0.05 < p < 0.1$ ). Coexistent limited joint mobility and Dupuytren's contracture correlated strongly with retinopathy in both sexes. Retinopathy was present in 63% (17/27) of subjects with both abnormalities but in only 15% (9/59) of those with neither complication ( $p < 0.001$ ). Insulin dependence was inversely related to limited joint mobility ( $p < 0.02$ ).

#### Comment

This survey shows that the prevalence of limited joint mobility is increased not only in diabetes but also in healthy men compared with women and in hypertensive patients. The high prevalence in normal men, which had no discernible relation to occupation, may explain the difficulty in detecting significantly increased prevalences in male diabetics and hypertensives compared with healthy men. Both limited joint mobility and Dupuytren's contracture were related to increasing age and to retinopathy in diabetic patients. This previously noted association of Dupuytren's contracture and retinopathy<sup>3</sup> has been largely neglected but in our present study was highly significant ( $p < 0.0001$ ). Dupuytren's contracture of diabetes has been

suggested to differ from the orthodox disorder in its distribution<sup>4</sup> (fifth fingers rarely affected) and our patients conformed to this pattern (two fifth fingers in 156 fingers affected). The aetiologies of Dupuytren's contracture and limited joint mobility in diabetes may be linked.

Increased glycosylation of collagen has been suggested as the pathogenesis of limited joint mobility,<sup>2</sup> glycosylation of basement membranes explaining the associated microangiopathy.<sup>2</sup> Tissue glycosylation, however, is no greater in diabetics with limited joint mobility than in other diabetics,<sup>5</sup> and glycosylated haemoglobin correlates with tissue glycosylation<sup>2</sup> but not with limited joint mobility.<sup>1</sup> Our findings are compatible with an alternative aetiology. The association of limited joint mobility and retinopathy may suggest that microvascular disease is a factor in the pathogenesis of limited joint mobility and not solely in diabetes. Limited joint mobility may be a vascular related phenomenon of aging, where women are "protected" in a manner similar to ischaemic heart disease, while diseases which cause vascular damage such as diabetes, hypertension, and possibly scleroderma may accelerate the changes of limited joint mobility.

We thank Dr J J Brown, MRC Blood Pressure Unit, for kind permission to examine his patients, and Alison Wood for secretarial help.

- Rosenbloom AL, Silverstein JH, Lezotte DC, Richardson K, McCallum M. Limited joint mobility in childhood diabetes indicates increased risk of microvascular disease. *N Engl J Med* 1981;305:191-4.
- Buckingham BA, Vitto J, Sandborg C, et al. Scleroderma-like changes in insulin-dependent diabetes mellitus: clinical and biochemical studies. *Diabetes Care* 1981;2:1027-8.
- Lawson PM, Maneschi F, Kohner EM. The relationship of hand abnormalities to diabetes and diabetic retinopathy. *Diabetes Care* 1983;6:140-3.
- Noble J, Heathcote JG, Cohen H. Diabetes mellitus in the aetiology of Dupuytren's disease. *J Bone Joint Surg* 1984;66(B):322-5.
- Lyons TJ, Kennedy L. Non-enzymatic glycosylation of skin collagen in patients with type I (insulin-dependent) diabetes mellitus and limited joint mobility. *Diabetologia* 1985;28:2-5.

(Accepted 4 April 1986)

#### Diabetic Clinic and Department of Medicine, Western Infirmary and Gartnavel General Hospital, Glasgow

J G LARKIN, MB, MRCP, medical registrar  
B M FRIER, MD, FRCP, consultant physician

Correspondence to: Dr J G Larkin, Department of Medicine, Western Infirmary, Glasgow G11 6NT.

### Legionnaires' disease cluster and reduction in hospital hot water temperatures

Official guidelines for maintenance of hospital water storage and distribution systems recommend that hot water should be above 50°C at outlets and cold water below 20°C to inhibit growth of *Legionella pneumophila*. In one hospital from 27 November 1980 to 15 July 1983 hot water was held between 55°C and 63°C at outlets, but from 15 July to 15 September 1983 it was considered essential to reduce hot water temperatures by about 10°C (precise data not available) in order to lower the working temperatures in the operating theatres during exceptionally warm weather. Eight weeks later an outbreak of nosocomial legionnaires' disease occurred which terminated just after the reintroduction of higher hot water temperatures.

#### Prevalences of limited joint mobility and Dupuytren's contracture in diabetic, hypertensive, and normal subjects

	Men			Women		
	No of subjects	No (%) with limited joint mobility	No (%) with Dupuytren's contracture	No of subjects	No (%) with limited joint mobility	No (%) with Dupuytren's contracture
Control	34	9 (26)†	4 (12)	66	6 (9)	10 (15)
Diabetic	80	29 (36)	36 (45)‡	88	38 (43)‡	26 (30)
Hypertensive	57	15 (26)	16 (28)	57	14 (25)†	9 (16)
Total	171	53 (31)	56 (33)*	211	58 (27)	45 (21)

\* $p < 0.05$  compared with women.

† $p < 0.05$  compared with control women.

‡ $p < 0.01$  compared with controls of same sex.