

## Obesity

### Charcot arthropathy – a mechanical complication of obesity and diabetes



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The most widely appreciated impact of obesity on diabetes is to amplify the risk of developing the disease in the first place. However, given obesity, the course of diabetes will also be a more stormy one.

There is good evidence that people with diabetes who are more obese are more likely to develop coronary artery disease (Cho et al, 2002). This is likely to be partly because obesity is associated with worse glycaemic control and exacerbates all aspects of the metabolic syndrome (Daousi et al, 2006).

Stuck and colleagues now make an interesting contribution to this literature by demonstrating that obesity is also a major independent risk factor for the development of Charcot arthropathy. The strength of the observed association is powerful, making the coincidence of peripheral neuropathy

and obesity an important predictor. While one can only speculate upon the precise explanation for this observation, the finding is entirely plausible, as obesity would obviously amplify abnormal mechanical forces on a weight-bearing joint, and increase the likelihood of progressive painless joint destruction.

Obesity is a strong risk factor for osteoarthritis of weight-bearing joints, and in the presence of a peripheral neuropathy Charcot arthropathy may be another mechanical complication of obesity.

Charcot arthropathy is often a devastating complication of diabetes, and this paper gives a remarkably simple insight into its pathogenesis, at least for some individuals. Weight loss would be an important treatment objective in these circumstances.

Cho E, Manson JE, Stampfer MJ et al (2002) A prospective study of obesity and risk of coronary heart disease among diabetic women. *Diabetes Care* **25**: 1142–8

Daousi C, Casson IF, Gill GV et al (2006) Prevalence of obesity in type 2 diabetes in secondary care: association with cardiovascular risk factors. *Postgrad Med J* **82**: 280–4

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### Obesity increases risk of Charcot arthropathy

Readability	✓✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓✓

- Charcot arthropathy is a severe, degenerative joint disease in the foot that can infrequently occur in people with long-standing diabetes.
- The study aim was to determine whether obesity increases the incidence of Charcot arthropathy in people with diabetes with and without peripheral neuropathy.
- The study sample comprised 652 people with diabetes who were newly diagnosed with Charcot arthropathy. BMI data were used to determine obesity (BMI  $\geq 30$  kg/m<sup>2</sup>).
- Logistic regression evaluated the likelihood of a person developing Charcot arthropathy as a function of obesity, peripheral neuropathy and their interactions, while controlling for diabetes control, patient characteristics and other comorbidities.
- Compared with people without obesity or peripheral neuropathy, people with obesity alone were approximately 59% more likely to develop Charcot arthropathy, people with peripheral neuropathy alone were 14 times more likely to develop Charcot arthropathy ( $P < 0.001$ ), and people with both obesity and peripheral neuropathy were 21 times more likely to develop Charcot arthropathy ( $P < 0.001$ ).
- Obesity is an independent and significant risk factor for Charcot arthropathy. People with obesity, diabetes and peripheral neuropathy are at particularly high risk of developing Charcot arthropathy, and should be targeted for preventative treatment.

Stuck RM, Sohn M-W, Budiman-Mak E et al (2008) Charcot arthropathy risk elevation in the obese diabetic population. *Am J Med* **121**: 1008–14

### DIABETOLOGIA

### Mediterranean diet reduces alanine aminotransferase levels

Readability	✓✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓

- The authors performed a post-hoc analysis of a quasi-randomised, controlled trial to determine the effect of three dietary interventions on alanine aminotransferase (ALT) levels in 259 obese people with type 2 diabetes.
- ALT is a diagnostic marker for non-alcoholic fatty liver disease (NAFLD); up to 70% of people with type 2 diabetes also have NAFLD.

- Participants received the American Diabetes Association diet ( $n=85$ ), a low glycaemic index diet ( $n=89$ ) or a modified Mediterranean diet ( $n=85$ ); ALT levels were measured at 6 and 12 months.
- ALT levels significantly decreased in all groups at both 6 and 12 months compared with baseline data. However, the modified Mediterranean diet resulted in the lowest ALT levels at both 6 and 12 months; this association did not decrease when controlling for possible mediators.
- A Mediterranean diet may have a beneficial effect on liver steatosis in obese people with type 2 diabetes.

Fraser A, Abel R, Lawlor DA et al (2008) A modified Mediterranean diet is associated with the greatest reduction in alanine aminotransferase levels in obese type 2 diabetes patients: results of a quasi-randomised controlled trial. *Diabetologia* **51**: 1616–22

## DIABETES CARE

### Obesity does not increase likelihood of diagnosis of diabetes

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓

**1** To determine whether obese people are more likely to have undiagnosed diabetes, 5514 adults were categorised as normal weight, overweight or obese, and the prevalence and diagnosis of diabetes across groups were compared.

**2** In total, 658 people had diabetes; of these, 28.1% were undiagnosed. Obese adults had a higher prevalence of diabetes than overweight or normal-weight adults.

**3** The proportion of adults with undiagnosed diabetes was comparable between the obese, overweight and normal-weight groups.

**4** Although obesity is a strong risk factor for diabetes, obese adults were no more likely to have their diabetes diagnosed than non-obese adults.

Wee CC, Hamel MB, Huang A et al (2008) Obesity and undiagnosed diabetes in the US. *Diabetes Care* **31**: 1813–15

## DIABETES CARE

### Weight loss improves risk factor control

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓

**1** This study analysed the electronic medical records of 2574 people aged 21–75 years who were newly diagnosed with type 2 diabetes between 1997 and 2002.

**2** Data were analysed to evaluate 3-year weight trajectories, related demographic and comorbidity factors, and diabetes medication to make predictions on glycaemic and blood pressure control in year 4.

**3** Four weight-trajectory groups were established: higher stable weight ( $n=418$ ); lower stable weight ( $n=1542$ ); weight gain ( $n=300$ ); and weight loss ( $n=314$ ).

**4** After adjustments, people in the higher stable weight, lower stable weight or weight gain groups were more likely than those in the weight loss group to have HbA<sub>1c</sub> levels  $\geq 7\%$  in year 4. People in the higher stable weight and weight gain groups were more likely to have blood pressure  $\geq 130/80$  mmHg than people in the weight loss group.

**5** Thus, weight loss improved predicted glycaemic and blood-pressure control in people with type 2 diabetes.

Feldstein AC, Nichols GA, Smith DH et al (2008) Weight change in diabetes and glycaemic and blood pressure control. *Diabetes Care* **31**: 1960–5

## DIABETES CARE

### CVD risk factor profile is worse in young people with recent diabetes

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓

**1** The study objective was to compare risk factors for cardiovascular disease (CVD) in young people aged 10–22 years with recently diagnosed

type 2 diabetes ( $n=106$ ) versus those without diabetes ( $n=189$ ).

**2** The young people with recently diagnosed type 2 diabetes (average duration 1.5 years) had a higher prevalence of many CVD risk factors (for example obesity, elevated blood pressure and dyslipidaemia) compared with those without diabetes.

**3** Adiposity and glycaemia were found to be associated with an unfavourable CVD risk factor profile in young people with recently diagnosed diabetes.

West NA, Hamman RF, Mayer-Davis EJ et al (2009) Cardiovascular risk factors among youth with and without type 2 diabetes. *Diabetes Care* **32**: 175–80

## DIABETES CARE

### Effective prescribing reduces early mortality in diabetes

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓

**1** Cholesterol-lowering statins and antihypertensive drugs have been shown to reduce cardiovascular events and early mortality in people with type 2 diabetes.

**2** The study aim was to determine whether changes in the use of statin therapy, antihypertensive drugs and oral hypoglycaemic drugs have affected trends in all-cause early mortality in people with type 2 diabetes.

**3** This cohort study comprised 48 579 people with type 2 diabetes who were first diagnosed between 1996 and 2006.

**4** Characteristics evaluated included the presence of coronary heart disease, stroke or renal disease. Drug prescriptions were analysed in terms of type of drug and usage, and all-cause mortality rates were estimated.

**5** Within the study period the incidence of type 2 diabetes increased. Within 12 months of diagnosis an increase in prescriptions was seen for statins, drugs acting on the renin–angiotensin system and metformin; the prescription of sulphonylureas declined.

**6** All-cause mortality within the first 2 years of diagnosis of diabetes declined (a relative decrease of 47% in men and 26% in women).

**7** More effective drug prescribing to control lipids, blood glucose and blood pressure may have contributed to lower early mortality in people with type 2 diabetes.

Charlton J, Latinovic R, Gulliford MC (2008) Explaining the decline in early mortality in men and women with type 2 diabetes. *Diabetes Care* **31**: 1761–6

**“Although obesity is a strong risk factor for diabetes, obese adults were no more likely to have their diabetes diagnosed than non-obese adults.”**