

What are the implications of newly-identified coeliac disease in patients with type 1 diabetes mellitus? Effect on glycaemic control, quality of life, cardiac risk factors and peripheral nerve function

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Previous work has shown that the prevalence of coeliac disease (CD) in patients with type 1 diabetes mellitus is thirty-three of 1000 (3.3%)⁽¹⁾. Those patients with newly-identified CD had worse glycaemic control compared with age- and gender-matched controls but similar quality of life scores. CD has also been associated with peripheral neuropathy but there are no data examining peripheral nerve function in patients with both CD and type 1 diabetes mellitus. The effects of a gluten-free diet (GFD) on glycaemic control, quality of life, cardiac risk factors and peripheral nerve function are unknown.

From the initial 1000 patient cohort four specific groups were identified and studied: group 1, type 1 diabetes and new CD (*n* 12); group 2, type 1 diabetes and established CD (*n* 12); group 3, type 1 diabetes alone (*n* 20); group 4, type 1 diabetes with positive coeliac antibodies but normal duodenal biopsy (*n* 17). Patients with CD alone were recruited to comprise group 5 (*n* 15). HbA1c was used to assess glycaemic control and the short form 36 version 2 health survey (SF-36v2[®]; QualityMetric, Lincoln, RI, USA) was used to assess quality of life. Peripheral nerve function was assessed by nerve conduction velocities in the right radial, sural, tibial and common peroneal nerves. Cold, vibration and heat-pain detection threshold was determined using the CASE IV machine (WR Medical Electronics, Stillwater, MN, USA) and cardiac autonomic function was assessed using the O'Brien protocol⁽²⁾.

There were no differences in age, gender distribution or BMI between the groups. In group 1 median HbA1c was 8.2% before starting a GFD and 8.6% after 1 year ($P=0.45$) and SF-36v2[®] scores did not change significantly. There were no changes in total cholesterol or TAG levels but total cholesterol:HDL-cholesterol increased from 3.7 to 3.2 ($P=0.033$). On cardiac autonomic testing mean resting heart rate was significantly lower in group 5 *v.* the other groups (65.5 beats per min *v.* 75.5 beats per min; $P=0.028$) but mean systolic and diastolic blood pressures were comparable. Radial and common peroneal nerve conduction velocities were significantly reduced in groups 1 and 2 compared with the other groups ($P=0.007$ and $P=0.0001$ respectively). However, there were no differences in cold, vibration and heat-pain detection thresholds between the groups.

Glycaemic control and quality of life are not altered following identification of CD in patients with type 1 diabetes and subsequent treatment with a GFD. However, there appears to be improvement in HDL-cholesterol levels. Resting heart rate is lower in patients who have CD but do not have diabetes, although blood pressure is similar. Patients with type 1 diabetes and CD have a higher prevalence of peripheral nerve dysfunction compared with controls.

1. Leeds JS, Hopper AD, Hadjivassiliou M *et al.* (2007) *Gut* **56**, Suppl. II, A33.
2. O'Brien IA & Corral RJ (1985) *Diabet Med* **2**, 143–144.