

Presentation of latent-type autoimmune diabetes in Emirati people under the age of 30 years

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Background

Both type 2 diabetes and latent-type autoimmune diabetes are increasingly being diagnosed in children and young adults, while the prevalence of obesity is increasing in this group and people with type 1 diabetes. Consequently, newly presenting hyperglycaemia in younger people is increasingly a diagnostic challenge. To date, there are no published estimates of the pre-test probability of each diagnosis in Emirati people who undergo screening with anti-GAD and anti-IA2 antibody testing.

Aims

We aimed to establish the prevalences of latent-type autoimmune diabetes in Emirati individuals presenting with hyperglycaemia below and above the age of thirty. A secondary aim was to determine whether body mass index (BMI) at presentation could provide useful diagnostic information in each age group.

Method

Imperial College London Diabetes Centre (ICLDC) is a specialist outpatient diabetes and general endocrine clinic with branches in Abu Dhabi and Al Ain.

We accessed all records where anti-GAD or anti-IA2 antibodies were reported at the initial consultation in Emirati people who presented to ICLDC between 01/2006 and 03/2017, were followed up for a minimum of two years and who were reviewed at ICLDC within the last year (n=12,449).

The diagnosis of latent-type autoimmune diabetes was made on the basis of anti-GAD titre of ≥ 10 IU/ml and recorded time to first insulin treatment of more than 6 months.

Results

167 individuals were identified as possible latent-type autoimmune diabetes according to our criteria. In individuals presenting with hyperglycaemia under the age of 30 years, 35.9% were subsequently diagnosed with type 1 diabetes, 55.3% with type 2 diabetes, 3.2% with latent-type diabetes and 5.7% with other diabetes aetiology or prediabetes. In individuals aged 30 years and over, 0.5% were diagnosed with type 1 diabetes, 93.6% with type 2 diabetes, 1% with latent-type diabetes, and 5.0% with other diabetes aetiology or prediabetes.

In Emirati individuals aged between 16 and 30 years, a BMI cut-off of 28.4 kg/m² provided positive predictive value (PPV) of 0.77 and negative predictive value (NPV) of 0.77, with area under the ROC curve (AUC ROC) of 0.84 (0.823-0.858) for discrimination of type 2 diabetes from all other diagnoses (n=1,960). In individuals aged 30 years or above, a BMI cut-off of 27.5 kg/m² provided PPV of 0.97 and NPV of 0.22 for type 2 diabetes versus other diabetes diagnosis (AUC ROC 0.809 (0.792-0.826), n=10622).

In individuals diagnosed with either type 1 or latent-type autoimmune diabetes, a cut-off of age 25 years at diagnosis provided PPV of 0.58 and NPV of 0.96 (AUC ROC 0.927 (0.91-0.945)) for distinguishing between the two disorders.

Age	Type 1	Type 2	Latent	Other
0-15	463 (85.90%)	50 (9.28%)	2 (0.37%)	24 (4.45%)
16-29	247 (17.14%)	1044 (72.45%)	61 (4.23%)	89 (6.18%)
30-44	38 (0.82%)	4272 (92.51%)	67 (1.45%)	241 (5.22%)
45-59	7 (0.16%)	4142 (94.57%)	34 (0.78%)	197 (4.50%)
60-74	1 (0.09%)	1105 (94.44%)	3 (0.26%)	61 (5.21%)
≥ 75	0 (0.00%)	113 (90.40%)	0 (0.00%)	12 (9.60%)
Total	756 (6.16%)	10,726 (87.40%)	167 (1.36%)	624 (5.08%)

Table 1 Clinical diagnosis of patients presenting to ICLDC with hyperglycaemia, divided by age group. Latent=antibody-positive diabetes with time to first insulin > 6 months, Other=secondary diabetes, monogenic diabetes, impaired fasting glucose or impaired glucose tolerance.

Discussion

We present pre-test probabilities for each diabetes diagnosis in patients undergoing anti-GAD and anti-IA2 screening. BMI remains a useful tool for distinguishing type 2 diabetes from other diabetes diagnoses in Emirati individuals over the age of 16 years. Although a cut-off of age ≥ 30 years is

commonly used to distinguish latent-type autoimmune diabetes from type 1 diabetes, our data indicate that this may underestimate the prevalence of this type of diabetes in our population.