The absence of diabetic autoantibodies when routinely tested in adult-onset type 1 diabetes is associated with a high prevalence of treatment change & successful insulin cessation.

R. Eason[1,2], A. Hill[1,2], B. Shields[1], P. Tippett[1], T. McDonald[3], A. Hattersley[1,2], R. Oram[1,2], B. Knight[1,2], M. Weedon[1,2], N. Thomas[1,2], A. Jones[1,2]

[1]National Institute for Health Research (NIHR), Exeter Clinical Research Facility, University of Exeter College of Medicine & Health, Exeter, UK, [2]Research & Development, Royal Devon & Exeter NHS Foundation Trust, Exeter, UK, [3]Department of Clinical Chemistry, Royal Devon & Exeter NHS Foundation Trust, Exeter, UK

Aims

We aimed to assess the impact of routine islet-autoantibody (AA; GAD, IA-2 & ZNT8) testing in adults with newly diagnosed type 1 diabetes (T1D).

Methods

Cohort: 713 adults with recent clinician diagnosed, insulin treated T1D in the prospective StartRight study (inclusion criteria age≥18, duration<12 months). We assessed the clinical & biomarker characteristics associated with positive (+VE) & negative (-VE) AA, then evaluated treatment changes 2 years after reporting AA results to clinicians.

Results

In participants with T1D (**Table 1**), 25% (178/713) were AA -VE with clinical & biomarker characteristics suggestive of a high prevalence of type 2 diabetes (T2D). T1D-Gentic Risk Score (T1DGRS) was markedly lower in AA –VEs, mean T1DGRS 0.244, vs AA +VEs 0.267 (p<0.001); (T2D mean 0.231) (**Fig 1A**). In 615 participants with a follow up urinary C-peptide creatinine ratio (UCPCR), the rate of decline was substantially lower in AA -VE vs +VE (**Fig 1B**; p<0.05) & the former more comparable to AA -VE T2D cases.

	AA Positive (N = 535)	AA Negative (N = 178)	*P* Value
Clinical Features			
Male (%)	51	73	<0.001
Age at diagnosis (years)	38.0 (36.8-39.2)	42.6 (40.5 – 44.8)	<0.001
BMI at diagnosis	25.0 (24.6-25.5)	27.5 (26.6-28.5)	<0.001
DKA at diagnosis (% Yes)	21.0	20.2	0.82
Osmotic symptoms at diagnosis (% Yes)	94.6	91.6	0.14
Weight loss pre-diagnosis (% Yes)	84.5	75.8	0.01
Other auto-immune condition (% Yes)	16.2	4.0	<0.001
Biochemical/Genetic Features			
HbA1c at diagnosis (mmol/mol)	105.4 (103.1-107.7)	109.8 (106.0-113.6)	0.06
Glucose at diagnosis (mmol/L)	21.3 (20.5-22.2)	23.5 (21.7-25.3)	0.02
Plasma C-Peptide at recruitment (pmol/L)	555 (520-590)	998 (874-1122)	<0.001

Table 1 - Clinical characteristics of participants with T1D defined by AA status. Brackets = 95% CI

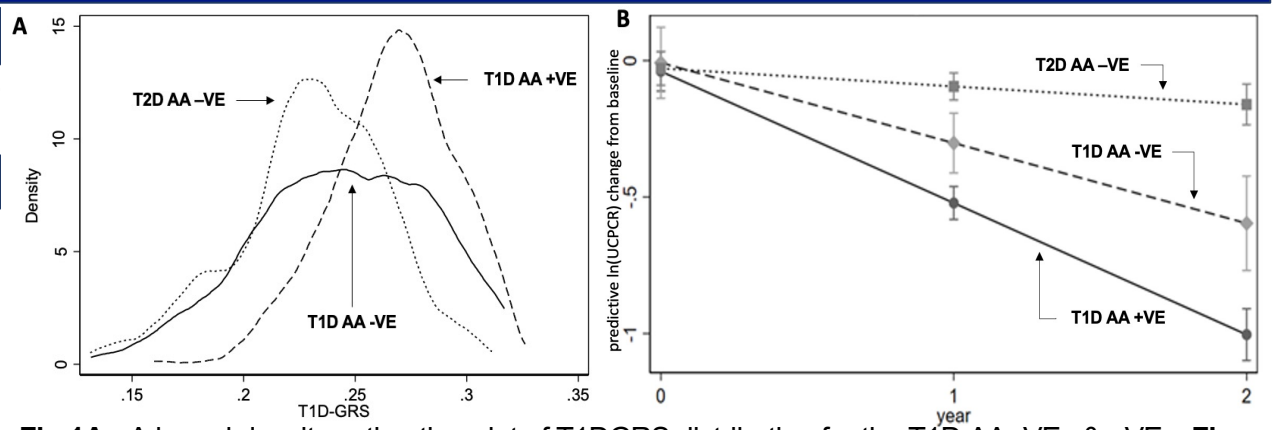
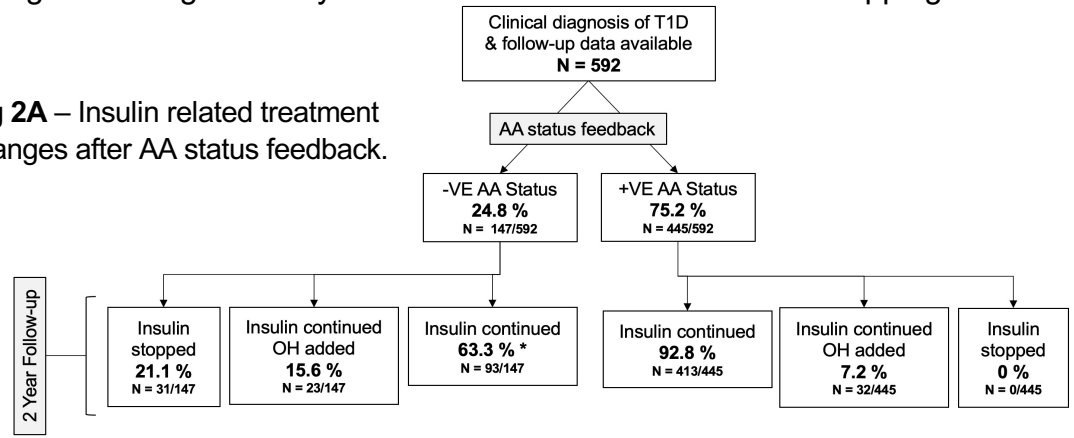


Fig 1A - A kernel density estimation plot of T1DGRS distribution for the T1D AA -VEs & +VEs. **Fig 1B** – Mixed Effects Linear Regression Model of predictive change of lnUCPCR from recruitment

When feeding back AA status, after 2 years 21.1% (31/147) of AA -VE participants stopped insulin & 15.6% (23/147) added an oral hypoglycaemic agent (OH) to an ongoing insulin regimen. Glycaemic control was maintained on stopping insulin.

Fig 2A – Insulin related treatment changes after AA status feedback.



Conclusions

In adult onset clinically diagnosed Type-1 Diabetes, -VE AA should raise a high suspicion of underlying T2D & is associated with successful insulin cessation. These findings support recent recommendations for routine AA assessment in adult-onset T1D.