

# Influence of $\beta$ -cell autoimmunity on cystic fibrosis related diabetes mellitus

## A DPV registry analysis



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### Introduction

CF related diabetes mellitus (CFRD) is a disease leading to deterioration of pulmonary function and mortality. Little is known on the role of diabetes antibodies in CFRD. This study aims to broaden the knowledge on the relation of  $\beta$ -cell autoimmunity and CFRD.

### Patients/Methods

878 patients with CFRD included in the multicenter, standardized German/Austrian/Luxembourgian diabetes registry DPV were analyzed using multivariable regression models (linear/logistic). Statistical analyses were performed using SAS Version 9.4 (Cary, NC, USA).

	Sex (Female%)	Age Median (IQR)	Age at Diagnosis (IQR)	Height SDS (IQR)	BMI-SDS (IQR)
Antibody positive (n=76)	68.4 %	17.8 years (15.6 – 20.8)	14.4 years* (11.4 – 16.0)	-1.06 (-1.91 – -0.164)	-0.81 (-1.61 – -0.20)
Antibody negative (n=802)	57.2 %	19.2 years (16.6 – 25.9)	16.1 years *(13.5 – 20.9)	-0.90 (-1.74 – -0.20)	-1.00 (-1.80 – -0.23)

Table 1: Clinical characteristics of  $\beta$ -cell antibody positive and negative CFRD patients. \*  $p < 0.001$

### Results

- 8.7% of patients were  $\beta$ -cell antibody positive (n=76)
- Patients with  $\beta$ -cell autoimmunity were diagnosed at younger age.
- No association of antibody status with
  - Sex
  - Height Standard Deviation Score
  - Body Mass Index Standard Deviation Score

- Insulin dose ( $0.94 \pm 0.07$  vs.  $0.75 \pm 0.02$  IU/kg/d,  $p=0.008$ )
- Frequency of insulin therapy (92.1 vs 75.7%,  $p=0.003$ )
- Proportion of continuous subcutaneous insulin infusion (CSII 15.0 vs. 6.7%,  $p=0.015$ )

HbA1c and frequency of diabetes complications differed slightly but not significantly

- HbA1c ( $7.5 \pm 0.2\%$  vs.  $7.2 \pm 0.1\%$ ,  $p=0.10$ )
- Hypoglycemic coma (2/76 vs. 8/802 patients)
- Diabetic ketoacidosis (DKA, 3/76 vs. 2/802 patients)

After adjustment for age and sex patients with autoantibodies showed higher:

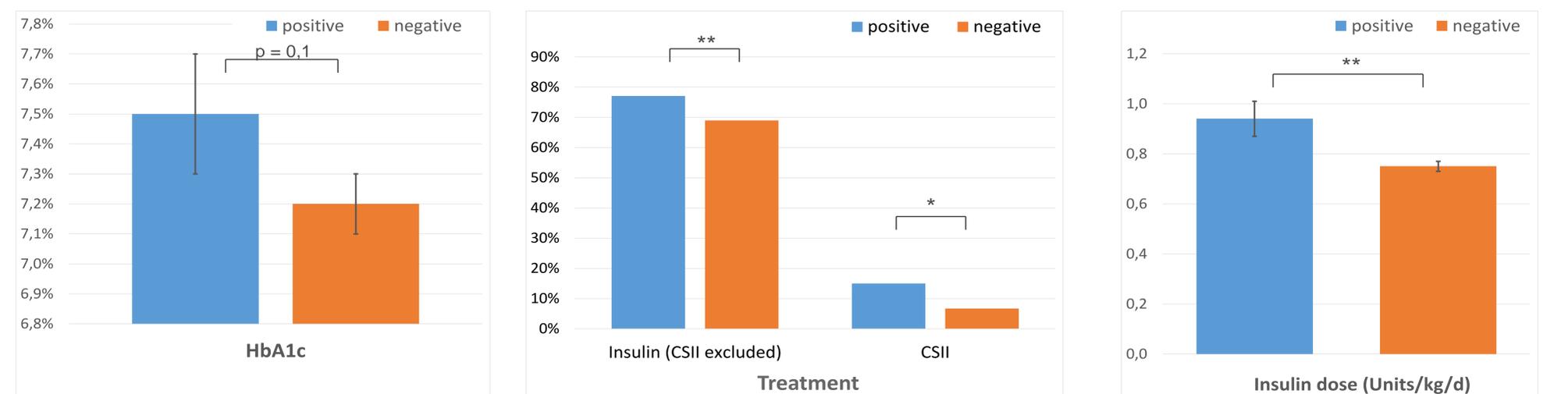


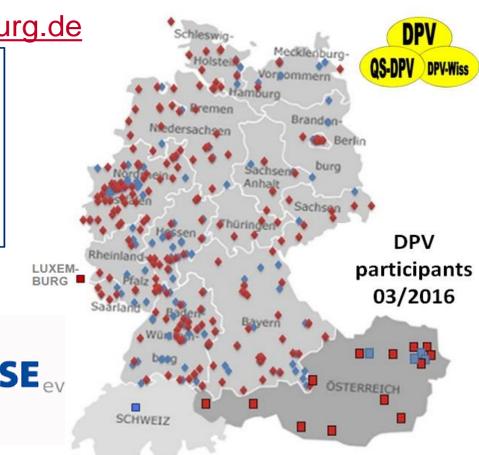
Figure 1: HbA1c (%), Treatment modalities (%), Insulin dose (U/kg/d). Blue columns antibody positive patients, orange columns antibody negative patients \*  $p < 0.05$ ; \*\*  $p < 0.01$

### Conclusion

A relevant percentage of CFRD patients in our cohort was  $\beta$ -cell autoantibody positive. Diabetes onset was earlier, insulin dose was higher and treatment was more intense in patients with autoimmunity. Nonetheless, HbA1c did not differ clinically relevant. CFRD patients with  $\beta$ -cell-antibodies might need a more intense therapy and should be treated with special attention.

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