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Metabolic syndrome in people living with type 1 diabetes in Belgium

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Background and objectives:

Metabolic syndrome, a hallmark of type 2 diabetes, is increasingly identified in people living with type 1 diabetes (T1D). The Initiative for the Promotion of Quality and Epidemiology of Diabetes Mellitus (IQED) is a quality control system imposed by the Belgian health insurance system systematically collecting since 2001 data from a random sample (10%) of all patients on intensive insulin therapy treated in all 102 specialized diabetes clinics of Belgium.

The aim of this cross-sectional, real-life observational study was to investigate the prevalence of metabolic syndrome (MS) and complications in adults with T1D.

Materials and methods :

We analyzed IQED data on adults with T1D, diagnosed aged ≤ 45 years, collected between 2016 and 2021. Metabolic syndrome was defined as presence of 2 or more of the following conditions: obesity (>30 kg/m²), hypertension ($\geq 140/90$ mmHg or treatment with anti-hypertensive drugs), albuminuria (>30 mg/dl), or dyslipidemia (TG ≥ 150 or HDL <40 mg/dl (<50 in women), or treatment with lipid lowering drugs). Observed values are expressed as proportion [95%CI], as mean [\pm SD], or median [IQR]. Statistical significance between patients in the MS and the NoMS group was tested using t-tests, Chi-squared and Kruskal–Wallis tests. The p values were adjusted for age, diabetes duration, sex and year using Generalized Estimating Equations (SAS9.4) with Tukey pairwise comparison.

Results: MS was present in 39 % (38-40) of the patients. The patient characteristics are shown in Table 1.

	NoMS (N=4600)	MS (N=2980)	P	Adj P
Male, %	56.1 [54.6-57.5]	60.0 [58.3-61.8]	***	
Age, years	43.2 [31.7-55.2]	52.7 [42.2-62.2]	***	
Age at diagnosis, years	22.5 [13.0-31.3]	24.3 [14.5-34.0]	***	
Diabetes duration, years	19.0 [10.3-30.2]	27.2 [16.8-38.2]	***	
HbA1c, mmol/mol (%)	60.6 [\pm 13.1] (7.7 [\pm 1.2]) (N=4550)	63.5 [\pm 13.4] (8.0 [\pm 1.2]) (N=2923)	***	***
Complications, %				
Albuminuria (>30 mg/dl)	3.1 [2.6-3.6] (N=4600)	40.6 [38.6-42.5] (N=2399)	***	***
Chronic kidney disease (eGFR ≥ 3)	6.9 [6.0-7.8] (N=2977)	27.8 [26.0-29.7] (N=2263)	***	***
Diabetic retino- or maculopathy	32.2 [30.8-33.6] (N=4250)	53.7 [51.8-55.5] (N=2757)	***	***
Peripheral neuropathy	5.6 [4.8-6.3] (N=3529)	17.5 [15.9-19.1] (N=2171)	***	***
CVD	8.2 [7.2-9.1] (N=3496)	26.8 [25.0-28.6] (N=2273)	***	***
Non insulin medication, %				
Lipid lowering drugs	1.7 [1.3-2.0] (N=4594)	22.9 [21.4-24.4] (N=2955)	***	***

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Anti-hypertensive drugs	22.9 [21.7-24.1] (N=4593)	71.7 [70.1-73.3] (N=2960)	***	***
Metformin	6.8 [6.0-7.5] (N=4561)	18.4 [17.0-19.8] (N=2929)	***	***
SGLT2-inh	1.1 [0.8-1.5] (N=4546)	2.0 [1.5-2.5] (N=2927)	**	**

*Table 1. N, denominator; SGLT2-inh, Sodium-glucose co-transporter 2 inhibitors. CVD defined as presence of myocardial infarction, heart attack, percutaneous coronary intervention, coronary artery bypass graft, transient ischemic attack, absence of foot pulses or peripheral bypass surgery. * p<0.05, ** p<0.01 and *** p<0.001*

Conclusions: In Belgium, metabolic syndrome is identified in almost 40% of the T1D patients. These patients are older, have a higher age at diagnosis and a longer diabetes duration and were more often male. They have a higher prevalence of complications compared to those without MS.