



High prevalence of the metabolic syndrome among newly diagnosed type 2 diabetes patients in Denmark

Jens Steen Nielsen¹, Reimar W. Thomsen², Sinna Ulrichsen Pilgaard², Anil Mor², Jacob Volmer Stidsen¹, Jørgen Rungby³, Søren Friberg¹, Ivan Brandslund⁴, Jens Sandahl Christensen⁵, Henrik Toft-Sørensen², Henning Beck-Nielsen¹

¹Diabetes Research Centre, Dept. of Endocrinology, Odense University Hospital, Odense, ²Dept. of Clinical Epidemiology, Aarhus University Hospital, Aarhus, ³Dept. of Pharmacology, University of Aarhus, Aarhus, ⁴Dept. of Biochemistry, Lillebaelt Hospital Vejle, Vejle, ⁵Dept. of Internal Medicine and Endocrinology, Aarhus University Hospital, Aarhus, all Denmark.

Background

Few population-based data exist on the prevalence of the metabolic syndrome (MS) its components, and its association with subclinical inflammation and insulin resistance among patients newly diagnosed with type 2 diabetes (T2D).

Results

Table 1	non-MS	MS
Newly diagnosed patients with T2D*	58 (11 %)	467 (89 %)

The number of patients in the DD2 cohort without (non) and with metabolic syndrome (MS) as defined by the International Diabetes Federation in 2009. *diagnosed after 1.1.2009

Table 2 n=525	non-MS	MS	Prevalence ratio
Waist circumference ≥94/80 cm	20 (34.5 %)	458 (98.1 %)	2.84 (2.49-3.20)
Elevated fasting BG ≥5,5 mmol/L	52 (89.7 %)	465 (99.6 %)	1.11 (1.02-1.20)
Elevated BP ≥ 130/80 mmHg	32 (55.2 %)	441 (94.4 %)	1.71 (1.48-1.94)
Increased TG ≥1,7 mmol/L	2 (3.4 %)	227 (48.6 %)	14.10 (12.73-15.46)
Reduced HDL-cholesterol <1,0/1,3 mmol/L	0 (0.0 %)	157 (33.6 %)	

The number and (percent) of patients matching the criteria for the metabolic syndrome (MS) as defined by the International Diabetes Federation and the prevalence ration (95% confidence interval).

Table 3 n=525, 51,7% men	non-MS	MS	Source
Age year	61,5 (50-66)	60,0 (53-66)	DD2
BMI	24,7 (22,5-27,5)	31,63 (27,7-35,9)	DDDA
Waist circumference cm	88 (76-94)	109 (99-118)	DD2
Fasting Bloodglucose mmol/L	6,58 (6,09-7,67)	7,16 (6,42-8,15)	DD2
Systolic BP mmHG	127 (120-140)	135 (125-145)	DDDA
Diastolic BP mmHG	80 (71-85)	80 (75-89)	DDDA
HbA1c percent	6,80 (6,30-11,70)	7,10 (6,20-40,00)	DDDA
Total cholesterol mmol/L	4,25 (3,25-4,90)	4,50 (3,70-5,20)	DDDA
C-peptide pmol/L	389 (305-563)	719 (510-934)	DD2
CRP, mg/L	1.20 (0.60-3.50)	2.40 (1.00-5.10)	DD2
Previous hospitalised with CVD	0	23.1%	NRP

Conclusion 1

89% of the newly diagnosed T2D patients have the MS, with 90% having elevated waist circumference, blood pressure and blood glucose, and <50% having elevated triglycerides and reduced HDL-cholesterol.

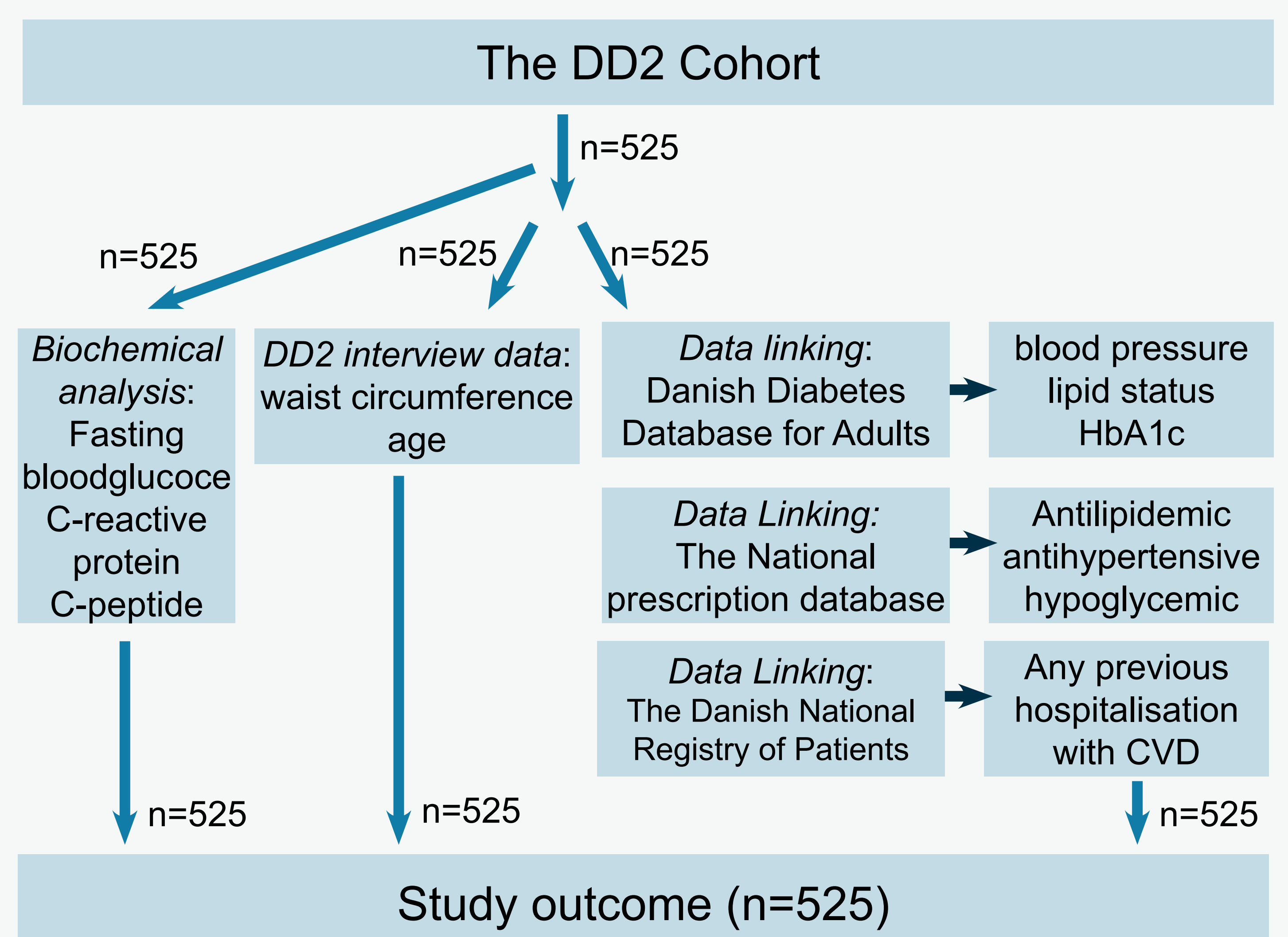
Conclusion 2

In T2D patients with MS

- Elevated C-peptide levels are common*
 - CRP levels are increased*
 - the risk of previous cardiovascular disease is high*
- * as compared to non-MS patients.

Methods

We examined the MS according to the International Diabetes Federation (IDF) criteria from 2009 by linkage primary data (waist circumference, fasting blood glucose, and C-reactive protein (CRP)) with variables from the Danish Diabetes Database for Adults (blood pressure and lipids) and a nationwide prescription database (antilipidemic, antihypertensive, and hypoglycemic drugs) as illustrated below.



Patient characteristics, numbers are median (quartile) and abbreviations are body mass index (BMI), bloodpressure (BP), C-reactive protein (CRP), The Danish Diabetes Database for Adults (DDDA), Danish Centre for Strategic Research in Type 2 Diabetes (DD2), and cardio vascular disease (CVD), The Danish National Registry of Patients (NRP).