

Cardiovascular or renal disease (CVRD) complication and mortality incidence for type 2 diabetics with a single or without CVRD comorbidity: a 5-year SNDS nationwide claims database cohort study

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Purpose

Myocardial infarction (MI), stroke, peripheral arterial disease (PAD), heart failure (HF) and chronic kidney disease (CKD) are common cardiovascular renal disease (CVRD) complications for type 2 diabetes (T2D). However, for those with a single CVRD comorbidity, the incidence of a new CVRD complication and death is not well known.

The objective was to assess the 5-year CVRD complication and mortality incidence for T2D patients with a single or without CVRD comorbidity at baseline.

Methods

Design: 5-year follow-up cohort study in the French nationwide claims database (SNDS, 99% of the 67 million people).

Data source: The SNDS contains individual pseudonymised information from birth to death and includes socio-demographics, outpatient (drug dispensing, visits, lab tests...) and inpatient information (hospital discharge summaries...).

Study populations:

T2D population: All adults identified with T2D diagnosis information on 1st January 2014 (i.e. index date).

T2D population without CVRD (disease-free): All patients of the T2D population without CVRD manifestation.

Co-morbid T2D population: All patients of the T2D population with a single CVRD manifestation on 1st January 2014.

Outcomes: Hospitalization with primary or associated diagnoses for MI, stroke, PAD, HF, CKD, HF or CKD, and all-cause death.

Data analysis: Crude incidence rates were estimated per 1,000 person-years for 5 years; the risk of death in each comorbid T2D population was compared to the disease-free T2D population using Cox proportional hazards, adjusted for age and sex.

Results

Selection of patients

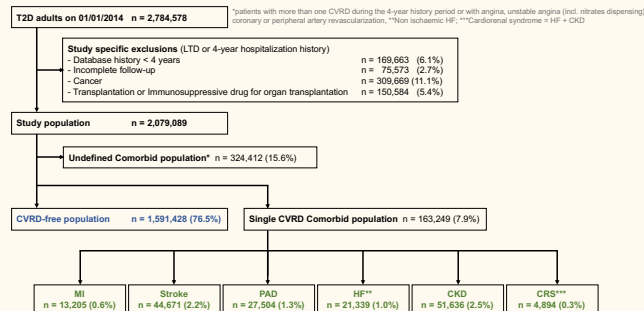


Figure 1. Selection of patients for analysis

Five-year incidence rate of outcomes

Table 2. Crude incidence rate of outcomes per 1,000 person-years for 5 years of follow-up

	Disease-free T2D population n = 1,591,428	Co-morbid T2D populations					
		MI n = 13,205	Stroke n = 44,671	PAD n = 27,504	HF* n = 21,339	CKD n = 51,636	CRS** n = 4,894
HF	11.0	25.1	22.3	29.5	86.0	31.7	156.3
CKD	17.9	28.3	32.8	41.1	59.8	149.7	279.5
HF or CKD	24.5	44.6	47.1	58.0	115.4	160.4	348.8
Stroke	5.1	7.8	22.8	10.1	10.7	9.4	16.4
MI	3.9	10.4	6.6	9.0	6.6	7.4	9.9
PAD	6.2	13.6	14.9	90.3	14.0	20.6	35.2
All-cause death	17.8	27.7	46.7	48.3	72.3	43.9	123.2

*Non ischaemic HF; **HF+CKD

Conclusions

While MI, stroke and PAD comorbidities remain major risks of complications for T2D patients, HF and CKD nowadays represent a clearly higher risk of CVRD complications and death, and that should encourage the development of specific preventive strategies.

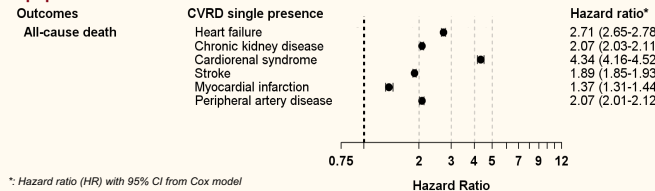
Main characteristics of populations

Table 1. Main characteristics of the study populations at index date

	Disease-free T2D population n = 1,591,428	Co-morbid T2D populations					
		MI n = 13,205	Stroke n = 44,671	PAD n = 27,504	HF* n = 21,339	CKD n = 51,636	CRS** n = 4,894
Mean (±SD) FU*** duration, years	4.8 (0.7)	4.7 (0.9)	4.5 (1.2)	4.5 (1.1)	4.2 (1.4)	4.5 (1.1)	3.8 (1.7)
Male, %	48.2	74.0	54.6	68.5	46.2	47.5	40.5
Median age, years	65.0	67.0	71.0	69.0	74.0	68.0	77.0
Diabetic complication, %							
Diabetic eye complications	1.9	2.8	4.2	6.0	3.6	18.8	16.0
Diabetic neuropathy	1.4	2.7	9.5	7.5	3.5	18.0	16.1
Severe hypoglycaemia	0.6	0.9	2.1	1.6	1.9	5.0	7.3
Keto-lactate acidosis	0.5	0.8	1.1	1.5	1.7	5.4	8.1
Lower limb amputations	0.1	0.1	0.1	2.6	0.1	0.6	0.8
Cardiovascular drug dispensing****, %							
Low dose aspirin	22.2	58.0	47.4	38.1	33.0	30.3	37.6
Statins	40.1	66.7	61.4	59.3	43.7	47.5	44.5
Antihypertensives	5.1	58.0	47.4	38.1	8.7	12.6	18.0
ACEI or ARB	53.7	73.4	68.0	66.8	73.0	70.3	67.1
Beta blockers	23.8	65.3	29.5	27.3	50.5	29.8	46.6
Low ceiling diuretics	1.1	1.4	2.2	1.8	1.7	2.3	2.7
P2Y12 antagonists, %	3.3	24.1	25.3	42.2	6.2	5.4	7.3
Last antidiabetic dispensing****, %							
Metformin	14.8	15.1	10.9	13.3	10.3	9.6	5.0
Sulfonylurea	33.0	34.1	29.1	32.1	30.4	26.7	17.6
MPP-4 inhibitors	12.5	12.1	11.6	12.4	12.5	12.8	10.2
Meiglinides	9.9	11.4	10.3	11.8	12.5	24.5	21.5
Ascarbose	3.6	3.1	3.1	3.5	3.6	3.0	2.6
Insulin	12.4	15.8	17.6	20.5	19.8	43.7	46.3

*Non ischaemic HF; **HF+CKD; ***Follow-up duration per patient; ****3 last months before index date

Risk comparison of all-cause death between Co-morbid and Disease-free T2D populations



*Hazard ratio (HR) with 95% CI from Cox model

Figure 2. All-cause death risk comparison between Co-morbid and Disease-free T2D populations – Cox model adjusted for age and sex