

Higher risk of a new cardiovascular renal complication for type 2 diabetic patients with a single cardiovascular or renal comorbidity.



ABSTRACT

BACKGROUND

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).

The risk of the first complication is fairly well established for T2D patients while the risk of new CVRD complication for those with one of CVRD comorbidities is not well known.

OBJECTIVES

To assess CVRD and mortality risks for T2D patients with a single CVRD: MI, stroke, PAD, HF, CKD or cardiorenal disease (CRD=HF+CKD) compared to T2D patients without CVRD comorbidity (disease-free T2D).

METHODS

Design & Data source:

- A 5-year follow-up cohort study within the SNDS French nationwide claims database (about 99% of the French population from birth to death)

Population:

All T2D patients identified without CVRD (disease-free) or with a single CVRD at index date (January 1st, 2014) and 4-year database history, no cancer nor organ transplantation history

Outcomes:

Hospitalization for MI, stroke, PAD, HF, CKD, cardiorenal disease (CRD=HF or CKD), and all-cause death.

Data analysis:

Hazard ratios (HR [IC95%]) adjusted for sex and age were estimated using:

- Cox proportional hazards risk model for all-cause death
- Fine and Gray competing risk model for clinical outcomes (MI, stroke, PAD, HF, CKD, CRD)

RESULTS

From about 2 million T2D patients without cancer or transplantation at baseline, 76.5% were disease-free, 7.9% with a single CVRD.

For T2D patients with a single CVRD complication compared to T2D disease-free patients of same age and sex, the risk of subsequent event is high, especially for PAD, CRD, CKD, HF and to a lesser extent, stroke and MI populations.

It was associated with an increased risk of death of about 4 times higher for CRD patients, about 3 for HF patients, about 2 for CKD, PAD and stroke patients, and 37% more for MI patients.

CONCLUSION

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, that needs improved preventive strategies.

Disclosure

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Type 2 diabetic patients with a single cardiovascular or renal comorbidity: 5-year risk of a new cardiovascular renal complication using the French Nationwide Claims Database

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Study populations 1,591,428 disease-free T2D population
163,249 co-morbid T2D 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 | HF+CKD n = 4,894 |
| 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 comorbidities, % | | | | | | | |
| Diabetes complication | 7.0 | 18.8 | 28.6 | 27.5 | 21.6 | 72.8 | 70.6 |
| Diabetic kidney disease | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 57.0 | 44.9 |
| Diabetic eye complications | 1.9 | 2.8 | 4.2 | 6.0 | 3.6 | 18.8 | 16.0 |
| Diabetic mononeuropathy | 1.4 | 2.7 | 9.5 | 7.5 | 3.5 | 18.0 | 16.1 |
| Diabetic foot or peripheral angiopathy | 1.0 | 7.1 | 8.9 | 14.4 | 5.1 | 7.5 | 12.1 |
| 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 |
| Other diabetes complications | 3.3 | 10.0 | 12.9 | 11.9 | 12.2 | 31.5 | 38.1 |
| 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) |

*Non ischaemic HF; **Follow-up duration per patient

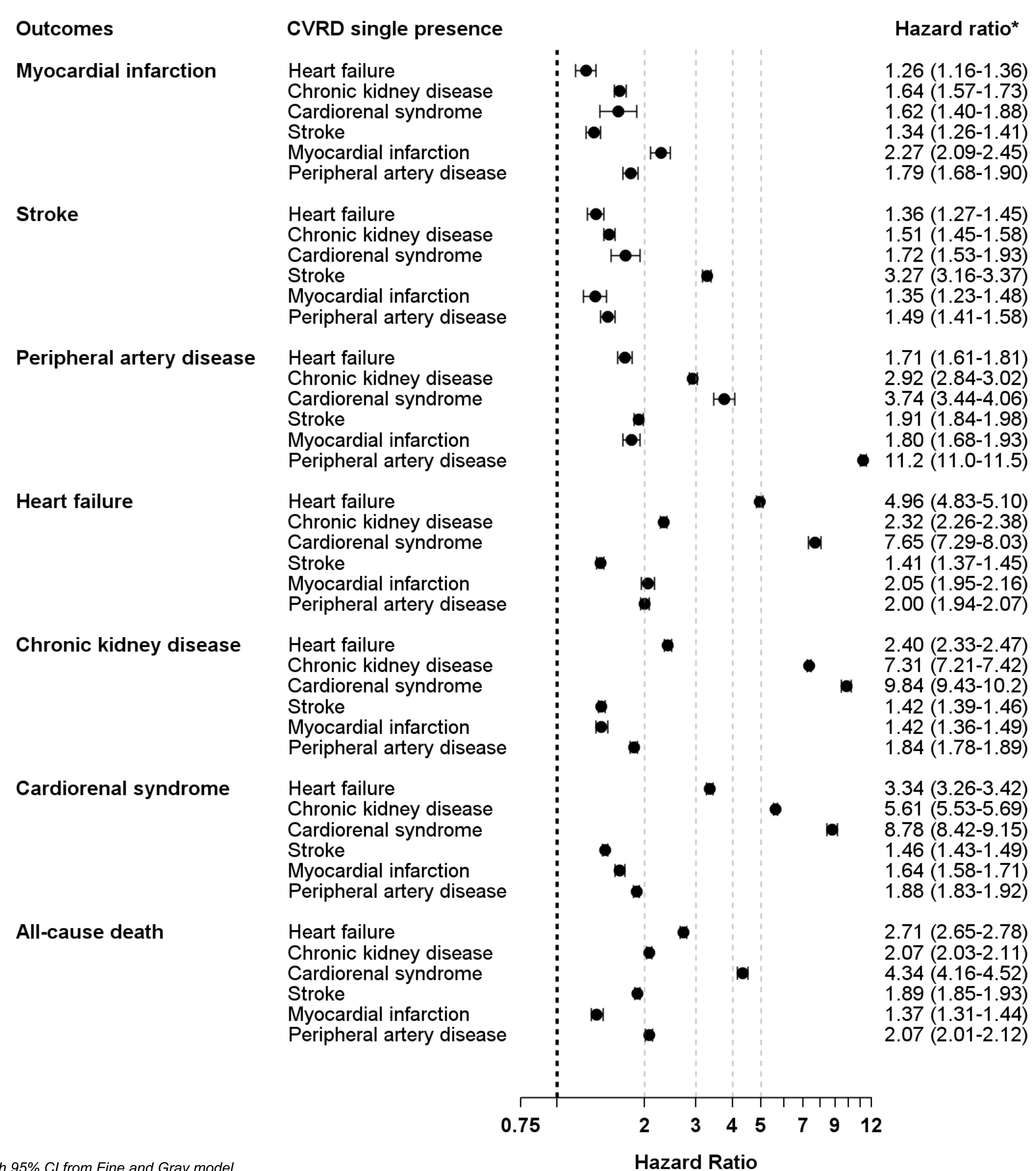
5-year incidence rate of outcomes

Table 2. Crude incidence rate of outcomes per 1,000 person-years (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 | HF+CKD 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

Risk comparison of outcomes: co-morbid vs. disease-free T2D populations



*: Hazard ratio (HR) with 95% CI from Fine and Gray model

Figure 1. Cardiovascular or renal risk comparison between Co-morbid and Disease-free T2D populations – Fine and Gray competing risk model and Cox model adjusted for age and sex