Hospital healthcare costs following incident CKD in Japan, Sweden and the USA

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• CKD is estimated to affect more than 850 million people worldwide\(^1\)

• It is associated with cardiorenal complications, premature mortality, and high healthcare burden and costs

• Patients with CKD often have comorbid T2D
  – Those without T2D are generally perceived to be at lower risk of adverse outcomes

Objective
To assess hospitalization risks and costs among patients with incident CKD stage 3–4, with and without T2D

CKD, chronic kidney disease; T2D, type 2 diabetes

Methods and baseline characteristics

- **OPTIMISE-CKD** is an observational study that uses secondary data from electronic health records and claims data sources.

- For CKD, HF, stroke, MI and PAD, we assessed:
  - incidence of in-patient hospitalizations in the year after date of incident CKD.
  - cumulative planned/unplanned inpatient/outpatient hospital healthcare costs per patient for up to 5 years after date of incident CKD.

**Inclusion criteria:** adult patients with incident CKD stage 3 or 4\(^a\)

**Exclusion criteria:** gestational diabetes, type 1 diabetes, stage 5 CKD\(^b\)

**Japan (N = 75 965)**
Jan 1, 2016 to Dec 31, 2022
MDV
- CKD stage 4: 15%
- Median age: 81 years
- 54% male
- 18% with T2D
- 82% without T2D
- HF: 31%
- RASI use: 31%
- SGLT-2i use: 3%

**Sweden (N = 76 133)**
Jan 1, 2016 to Mar 31, 2023
Nationwide registers
- CKD stage 4: 3%
- Median age: 78 years
- 48% male
- 23% with T2D
- 77% without T2D
- HF: 24%
- RASI use: 59%
- SGLT-2i use: 1%

**USA (N = 297 134)**
Jan 1, 2016 to Sep 30, 2022
CDM
- CKD stage 4: 7%
- Median age: 74 years
- 37% male
- 36% with T2D
- 64% without T2D
- HF: 17%
- RASI use: 54%
- SGLT-2i use: 2%

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\(^a\)Defined as having either two eGFR measurements ≤ 60 mL/min/1.73 m\(^2\) taken ≥ 90 days apart or a first eGFR ≤ 60 mL/min/1.73 m\(^2\) followed by a first CKD diagnosis

\(^b\)Based on eGFR < 15 mL/min/1.73 m\(^2\) or dialysis

CDM, Optum’s de-identified Clininformatics® Data Mart Database; CKD, chronic kidney disease; HF, heart failure; MDV, Medical Data Vision Co., Ltd database; MI, myocardial infarction; PAD, peripheral artery disease; RASI, renin–angiotensin system inhibitor; SGLT-2i, sodium–glucose co-transporter-2 inhibitor; T2D, type 2 diabetes
Hospitalization risks and costs were driven by CKD and HF

Event rates for hospitalizations with any diagnosis of CKD, a HF, stroke, MI or PAD 1 year after incident CKD

Costs per patient for hospitalizations associated with a main or secondary diagnosis of CKD, a HF, stroke, MI or PAD

a Including diagnoses of acute kidney failure, unspecified kidney failure, diabetic kidney disease, hypertensive CKD, dialysis, glomerular diseases, renal tubulointerstitial disease or other

b Conversion rates from January 1, 2019 were used (1 JPY = 0.0091 USD; 1 SEK = 0.1127 USD)

CKD, chronic kidney disease; HF, heart failure; JPY, Japanese yen; MI, myocardial infarction; PAD, peripheral artery disease; PY, patient years; SEK, Swedish krona; USD, US dollars
T2D vs non-T2D: higher costs but similar/lower risks

Event rates for hospitalizations with any diagnosis of CKD, a HF, stroke, MI or PAD 1 year after incident CKD

Costs per patient for hospitalizations associated with a main or secondary diagnosis of CKD, a HF, stroke, MI or PAD

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*Including diagnoses of acute kidney failure, unspecified kidney failure, diabetic kidney disease, hypertensive CKD, dialysis, glomerulonephritis, renal tubulointerstitial disease or other

*Conversion rates from January 1, 2019 were used (1 JPY = 0.0091 USD; 1 SEK = 0.1127 USD)

CKD, chronic kidney disease; HF, heart failure; JPY, Japanese yen; MI, myocardial infarction; PAD, peripheral artery disease; PY, patient years; SEK, Swedish krona; T2D, type 2 diabetes; USD, US dollars
Conclusions

- Among patients with incident CKD, hospitalization risks and costs were high and largely driven by cardiorenal events (CKD and/or HF), regardless of T2D status
- Risks and costs for ASCVD were comparatively lower than for cardiorenal events
- Costs were higher in patients with T2D than in those without T2D
  - Conversely, risks were similar or lower, potentially due to better monitoring and management of patients with T2D versus those without T2D
- These findings were consistent across the three countries, despite differences in healthcare systems

Strengths

- Large, contemporary population
- Consistent results across three countries
- Total hospital healthcare costs available

Limitations

- Between-country comparisons of hospital healthcare costs were not possible owing to differences in healthcare/reimbursement structures
- Some costs may be underestimated owing to limited availability of RRT costs in some countries
- Results were not adjusted for baseline differences between patients with and without T2D
- Japan database includes data from acute care hospitals only

ASCVD, atherosclerotic cardiovascular disease; CKD, chronic kidney disease; HF, heart failure; RRT, renal replacement therapy; T2D, type 2 diabetes
Thank you