

**Age specific risk of subsequent end stage renal disease for patients
with diabetes**

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Abstract

Objectives: To investigate the age-specific risk of chronic kidney disease (CKD) and end stage disease (ESRD) in patients with diabetes mellitus (DM).

Methods: From Taiwan's universal insurance claims data, age-specific (20-49, 50-64 and ≥ 65 years) annual incidence from 1997-2010 were depicted. We identified 57586 patients with DM newly diagnosed in 1998-2007 and 172744 non-DM subjects frequency matched for sex, age, and diagnosis date. Both cohorts were followed up until 2012 to estimate the incidence and risk of DM and ESRD.

Results: The incidence rates of both CKD and ESRD increased with age. But, the age-specific DM cohort to non-DM cohort incidence rate ratio (IRR) of CKD decreased from 4.24 (45.8 vs. 10.8 per 10000 person-years) for 20-49 years group to 1.33 (146.7 vs. 109.7 per 10000 person-years) for the elderly. The corresponding age-specific IRRs of ESRD decreased from 15.0 (20.4 vs. 1.36 per 10000 person-years) to 5.38 (24.7 vs. 4.60 per 10000 person-years), respectively. However, the Kaplan-Meier analysis showed that age-specific differences in cumulative portions of incident CKD and ESRD between DM and non-DM cohorts were the highest in the 50-64 years group. Compared with the non-DM cohort, the DM cohort had Cox model measured overall adjusted hazard ratios (HRs) of 1.68 (95% CI 1.61-1.75) for CKD and 9.22 (95% CI 8.12-12.5) for ESRD. Interaction analysis showed that, comparing with subjects without DM and hypertension, patients with

DM were at a much higher risk for ESRD than those with hypertension [HR 12.6 (95% CI 10.6-15.0) vs. 2.03 (95% CI 1.62-2.54)] , but not in the association with CKD [HR 2.80 (95% CI 2.62-2.99) vs. 2.67(95% CI 2.53-2.83)].

Conclusions: DM patients are at much higher risk of developing CKD than developing ESRD. But the hazard ratio of ESRD was much greater than that of CKD for DM cohort, compared with non-DM subjects. The relative risks of CKD and ESRD in DM patients were much greater for the younger than the elderly.

Key words: Chronic kidney disease, diabetes, end stage renal disease, hypertension, retrospective cohort study.

Database: LHID2000

Case: patients with DM (ICD-9-CM 250) in 1997-2008 (N=59415) and the date of DM as index date. Those were excluded with CKD or ESRD history (ICD-9-CM 585) before the index date.

Control: 3 controls matched with age (every 5 years), sex, and index year and month from people without DM history.

End-point: ESRD (ICD-9-CM 585) from Catastrophic Illness Patient Database (CIPD), CKD (ICD-9-CM 585) or the end of 2010. CKD was defined more than twice OPD or once IPD.

Comorbidity: Hypertension (ICD-9-CM 401-405), kidney disease (ICD-9-CM 580-584, 586-591), CVD (ICD-9-CM 410-414, 425-438) before index date.

Hypertension and hyperlipidemia were defined more than three times OPD or once IPD.