

An overview of the BC patients with Chronic Kidney Disease registered from 2003 to 2007

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Introduction: In British Columbia (BC), formal registration and full data collection of all patients with Chronic Kidney Disease (CKD) followed by nephrologists have existed since 2003. BC is the only province in Canada with this type of complete data. The CKD registration and complete follow up permit accurate assessment of outcomes of CKD patients over time. In BC, there is formal funding for CKD, though variable implementation of CKD models of care depending on geographic and other considerations within 5 geographical health authorities. The aim of this analysis is to compare demographic and clinical characteristics of new CKD patients in BC over the years.

Methods: We created a cohort of 10,111 patients registered as CKD patients in BC from 2003 to 2007 who had follow up for 3 years so as to compare outcomes of the specific cohorts with similar exposures to the duration of care. Data were extracted from the Provincial Record and Outcome Management Information System (PROMIS), which stores prospectively collected data from all patients referred for kidney disease in BC, Canada. This database is managed and updated by the British Columbia Provincial Renal Agency. We characterized the cohorts by demographics and eGFR at time of referral. The outcomes of interest are patient survival and Renal Replacement Therapy (RRT) event rate by year of CKD initiation at 3 years, as well as eGFR at time of dialysis start.

Results: Over the 5-year period, between 1700 and 2400 new CKD patients were registered each year. By design, follow-up time is 3yrs. The cohorts of new patients registered each year remain remarkably similar: median age of 71 years, 44% female, 66% Caucasian, 26% Asian, 38% have diabetes, 79% had hypertension, and 57% were taking ACE inhibitors or angiotensin receptor type-1 blocker (ARB). Despite the similarity in the demographic characteristics among the cohorts, the median eGFR at entry increased from 30ml/min in 2003 to 34 ml/min in 2007.

From the 1637 patients who reached the End Stage of Renal Disease (ESRD), 95% of them started dialysis and 5% underwent pre-emptive transplant. The selection of PD vs HD as ESRD modality has not changed appreciably over time and remains at about 26% vs 74% respectively.

Figure 1 depicts the Kaplan-Meier CKD patient survival curves by the year of CKD initiation. The log-rank test indicates patient survival varies by year of CKD initiation (p-value < 0.0001). Based on a Cox proportional hazard model, the estimated hazard ratios for mortality decreases from 97% in 2004 to 77% in 2007 (compared to 2003) after adjusting for age, gender, ethnicity, eGFR at CKD initiation, urine albumin/creatinine ratio (ACR), and dialysis (as time-varying covariate). Figure 2 presents the cumulative incidence curves of RRT by year of CKD initiation, accounting for death as a competing risk factor. The Gray's test, a modified log-rank test, indicates differences in the incident rate for RRT by CKD year (p-value<0.0001). The adjusted hazard ratios for RRT obtained based on a competing risk approach decreases from 81% in 2004 to 65% in 2007 (compared to 2003).

Conclusions: This unique and well characterized over time database, with 10,111 CKD patients in BC from 2003 to 2007, serves the basis for ongoing evaluation of new strategies and outcomes. Over time, there appears to be a significant improvement in the overall patient survival, as well as a delay in the progression of the disease, as indicated by less RRT starts. Reasons for this improvement warrant further study.

Figure 1. Kaplan-Meier Overall Patient Survival Curves by Year of CKD Initiation

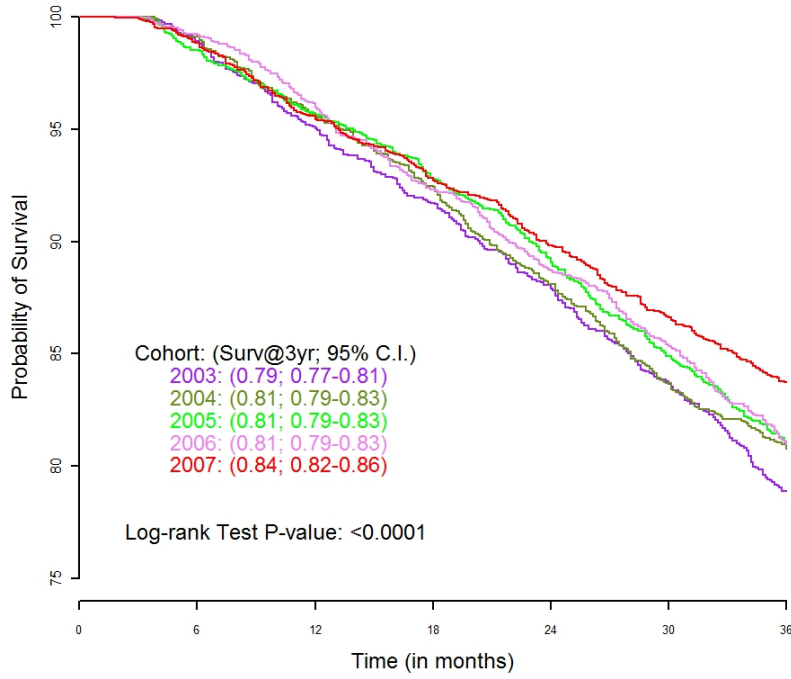


Figure 2. Cumulative incidence of RRT by Year of CKD Initiation (Competing Risk Approach)

