Comparison of Survival among Older Adults with Kidney Failure Treated versus Not Treated with Chronic Dialysis

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INTRODUCTION
Treatment for older adults with kidney failure generally includes chronic dialysis or non-dialysis care.

Prior studies comparing survival among dialysis and non-dialysis care have been limited by the following: 1,2
- Single-center studies managed by nephrology teams
- Considerable differences in baseline characteristics
- Potential for lead-time and immortal time biases

AIM
To compare time-to-all-cause mortality among older adults with kidney failure treated versus not treated with chronic dialysis, addressing treatment-selection, lead-time, and immortal time biases.

METHODS
- We used linked administrative and laboratory databases to identify adults aged ≥65 in Alberta with kidney failure from 2002-2012.
- Kidney failure defined by ≥2 consecutive outpatient eGFR measurements of <10 ml/min/1.73m² spanning a period of ≥90 days (figure 1).
- Cox regression modeling with propensity score matching to account for baseline demographic and comorbid differences.
- A time-varying exposure was used to address immortal time bias.

RESULTS
- 838 patients met cohort inclusion criteria (figure 2).
- 396 (47.3%) were included in the final propensity score matched cohort.
- The balance of covariates between the two groups improved after propensity score matching (table 1).
- The mean standardized differences in covariates decreased from 22.5% (range 0.2 to 99.9%) before matching to 2.8% (0.0 to 9.1%) after matching, achieving balance across all included covariates (figures 3 and 4).
- Mean age 80.4, 44.7% male, mean eGFR 7.8 ml/min/1.73m².

Table 1. Baseline characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Dialysis</th>
<th>Non-dialysis</th>
<th>Standardized difference (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dialysis</td>
<td>Non-dialysis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N=396</td>
<td>N=442</td>
</tr>
<tr>
<td>Male</td>
<td>273 (69)</td>
<td>223 (50)</td>
<td>30.3</td>
</tr>
<tr>
<td>Mean age (SD)</td>
<td>76.3 (6.4)</td>
<td>83.2 (7.2)</td>
<td>-99.9</td>
</tr>
<tr>
<td>Mean eGFR at index (SD)</td>
<td>7.8 (1.4)</td>
<td>7.7 (1.6)</td>
<td>3.6</td>
</tr>
<tr>
<td>Comorbidities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dementia</td>
<td>26 (6.2)</td>
<td>82 (24.3)</td>
<td>-55.8</td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>74 (18.1)</td>
<td>68 (20.1)</td>
<td>14.0</td>
</tr>
<tr>
<td>Diabetes</td>
<td>273 (69)</td>
<td>173 (42)</td>
<td>8.8</td>
</tr>
<tr>
<td>Hypertension</td>
<td>482 (96)</td>
<td>308 (91.4)</td>
<td>20.9</td>
</tr>
</tbody>
</table>

- Compared to non-dialysis, there was a reduction in risk of death among those treated with dialysis within the first 3 years of follow-up: HR 0.55 (95% CI 0.41 to 0.74).
- However, after 3 years, dialysis no longer conferred a survival advantage: HR 2.30 (95% CI 1.11 to 4.81) (figure 5).
- The results were robust in a number of sensitivity analyses:
  - Excluding patients with late referral to a nephrologist
  - Excluding patients not referred to a nephrologist
  - Excluding patients with improved kidney function post-cohort entry

REFERENCE

CONCLUSIONS
- Among older adults with kidney failure defined by sustained eGFR <10 ml/min/1.73m², dialysis may confer a reduced risk of all-cause mortality within the first 3 years of treatment.
- The information generated about survival regarding early mortality may support shared treatment decision-making within nephrology and primary care settings when managing older adults with kidney failure.

STRENGTHS & LIMITATIONS
- We used a population-based cohort, and were able to account for clinically important baseline characteristics.
- Using an eGFR-based algorithm to identify does not fully address lead-time bias, and potential for misclassification bias.

REFERENCES

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