SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

The Associations between Immunosuppression Use, Loss of Medicare and Kidney Allograft Outcomes

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Introduction

- In the US, Medicare coverage for kidney transplant recipients aged < 65 years ends at 3 years post-transplant
- A significant proportion of recipients remain on Medicare under disability coverage.
- We sought to describe the association of immunosuppressant use and loss of Medicare with subsequent graft failure using data from the Symphony database of pharmaceutical claims.
- We also examined predictors of early (before 3 years), as expected (between 3 years and 3 years, 3 months), and late (after 3 years, 3 months) loss of Medicare coverage in the general kidney transplant population.

Methods

- The restrospective Symphony cohort composed of 24,580 Medicare-covered adult kidney-alone transplants between January 1, 2008 – May 31, 2012 with graft function at 2.5 years post-transplant who filled at least one immunosuppressant in Symphony between 2 to 2.5 years post-transplant (*n*=24,580).
- The full Medicare cohort included all 78,586 kidney-alone adult recipients between January 1, 2008 –December 31, 2014 who were Medicare-covered at transplant.
- Medicare payer sequence file and Symphony pharmacy fills database (January 1, 2008 – December 31, 2014) linked with data from the Scientific Registry of Transplant Recipients.
- Immunosuppressant use defined as medication possession ratio (MPR), calculated as the sum of days supplied divided by days at risk for filling
- A Cox proportional hazards model was used to evaluate the association between immunosuppression class-specific MPRs over 6-month time intervals and time-dependent loss of Medicare on subsequent allograft failure
- Association between loss of Medicare and subsequent graft failure among all recipients in the Medicare cohort evaluated using both Cox and piecewise exponential survival models with separate effects for early, as-expected, and late time intervals

Results

- In the Symphony cohort, higher MPR for both CNIs and antimetabolities was independently associated with lower hazard of allograft failure after 2 years [CNI HR = 0.82, 95% CI = (0.74-0.90); Antimetabolite HR = 0.52, 95% CI = (0.46-0.59)]
- Loss of Medicare either before or after the "as-expected" 3 year time was strongly associated with kidney allograft failure. HRs for allograft loss after early Medicare loss ranged from 5 – 13. This relationship held in both the Symphony (*n* = 24,580) and full Medicare (*n* = 78,586) cohorts (**Figure 1**).
- Although losing Medicare at 3 years was the most common event (40.4% in the full Medicare cohort,), 2.4% lost Medicare prior to 3 years and 6.5% lost Medicare after 3 years (censored at December 31, 2014) (**Figure 2**)
- We observed significant interactions between several demographic and clinical characteristics and loss of Medicare. Notably, Black recipients were more likely to lose Medicare early than white recipients; the reverse was true for as-expected loss at 3 years (**Figure 3**).
- There was a positive relationship between income and loss of Medicare: recipients living in zip codes with lower median household income levels were more likely to lose Medicare early; the reverse was true for as-expected loss at 3 years (**Figure 4**).

Figure 1.Time-dependent association between losing Medicare and allograft failure (unadjusted).

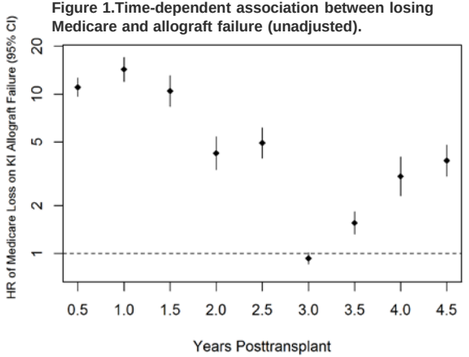


Figure 2. Loss of Medicare from time of transplant.

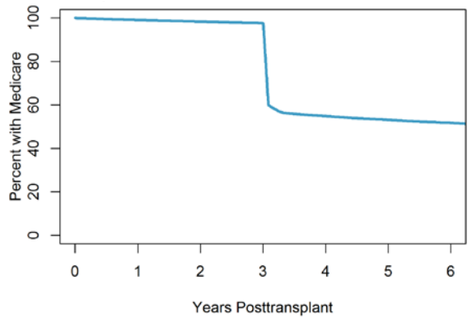


Figure 3. Association between race and loss of Medicare by time of Medicare loss

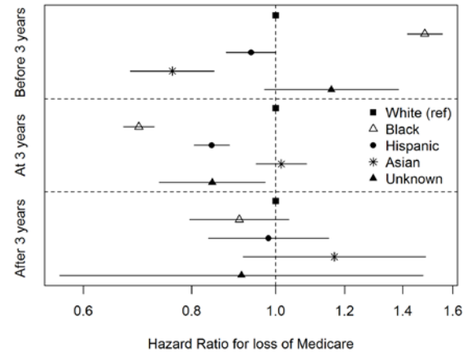
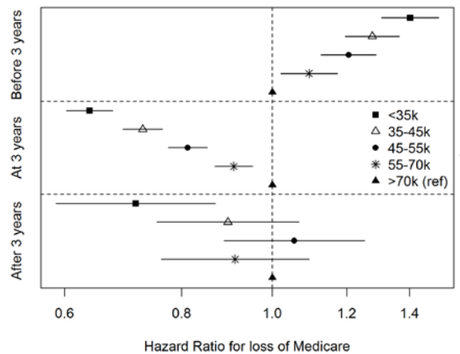


Figure 4. Association of median household income with loss of Medicare by time post-transplant



Conclusions

- We established a relationship between a lower MPR of both CNIs and antimetabolites and higher risk of kidney allograft failure at 2 years post-transplant.
- In both the Symphony and the larger Medicare cohort, we found a markedly increased hazard of kidney allograft failure with either early or late Medicare loss, but no increased risk if Medicare was lost as-expected at 3 years.
- Covariates associated with higher risk of kidney allograft loss (black race, diabetes as primary diagnosis, longer ESRD time, lower median household income, lower educational attainment) were also found to be associated with early Medicare loss.
- While the reason for early or late Medicare loss is unknown, loss due to nonpayment of Medicare Part B premiums would explain the association with lower MPRs and higher rates of allograft loss, supported by the inverse association between median household income and loss of Medicare.
- Additional research on the cause of early or late Medicare loss and its effect on MPR and allograft outcomes is warranted, including the reason for Medicare loss, the disproportionate effect in Black recipients and the cost of lost allograft years relative to the cost of subsidizing immunosuppression medications.

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