Insurance Coverage and Heart Transplant Outcomes

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Heart transplantation in the United States has largely been restricted to patients with adequate health insurance coverage to optimize recipient outcomes, particularly in the context of the scarcity of donor organs.\(^1\,^2\) Public health insurance programs, such as Medicaid and Medicare, have been instrumental in providing access to heart transplantation and other solid organ transplants for patients unable to afford private insurance. Recent healthcare reform with implementation of the Affordable Care Act expands the Medicaid program and provides substantial subsidies for low-income patients unable to afford private insurance.\(^3\) Oliveira et al\(^4\) recently assessed the number of transplant listings in states that have been adopters of the Affordable Care Act and demonstrated that the number of Medicaid beneficiaries listed for heart transplantation increased in states that had adopted the Affordable Care Act to expand Medicaid access compared with states that did not adopt the Affordable Care Act.\(^4\) While not assessing the number of heart transplants performed or outcomes after heart transplant, data from the study by Oliveira et al\(^4\) reinforce the importance of public health insurance coverage in providing access to heart transplantation services for vulnerable populations.

Although efforts to improve access to heart transplantation for the uninsured or underinsured are critical and have significant overall benefit for vulnerable populations, access to public health insurance alone has not necessarily translated to equivalent outcomes when heart transplant outcomes for patients with public health insurance are compared with patients with private health insurance coverage.\(^5\,^6\) Previous studies in heart transplantation have demonstrated higher mortality, decreased graft survival, and higher rates of rejection for recipients receiving heart transplants with Medicare or Medicaid health insurance coverage compared with those with private health insurance.\(^5\,^6\) This finding is not unique to heart transplantation, and previous studies have demonstrated that outcomes for other solid organ transplants, including lung,\(^9\) liver,\(^10\) and kidney,\(^11\) are inferior when transplant recipients with public health insurance are compared with transplant recipients with private health insurance coverage.

There are at least 2 important reasons why public health insurance coverage for heart transplantation has been independently linked to worse recipient and graft survival and higher rates of rejection. First, public health insurance is likely a surrogate for multiple other complex factors that are not adequately accounted for in either administrative and patient data sources where granular data characterizing many important recipient factors are absent.\(^12\) Previous studies have identified presentation in later stages of heart disease for patients with public insurance requiring heart transplantation.\(^13\) Thus, a vulnerable population requiring public health insurance has inherent characteristics, identified collectively as the need for public health insurance, that increase the risk of heart transplantation. Second, public health insurance is potentially an inferior health insurance product in many aspects compared with private health insurance plans. Lower reimbursement rates for physicians, restrictions on medications covered under public insurance plans, and higher copayments, particularly for immunosuppression medications, may reduce access to specialized or primary care physicians, increase medication nonadherence or nonadherence to medical visits, and inadequately address other comorbidities.\(^14\,^16\) The 20% copayment for immunosuppressive medications required under Medicare is higher compared with other private health insurance plans in many instances and is an example of the increased burden for those at-risk populations.\(^14\) Although public health insurance coverage makes access to healthcare possible, the ability for a vulnerable population to leverage this access to full benefit likely differs because of the absence of other important resources when comparing with patients with private health insurance.

Importantly, the type of health insurance coverage, either public or private, available over the course of a recipient’s lifetime with a heart transplant is likely not a static situation, but to date, few studies have considered transitions in the type of health insurance coverage.\(^7\) Previous studies investigating the influence of the type of health insurance coverage on heart transplant outcomes have only considered the type of health insurance present at transplant listing or time of transplant.\(^5\,^8\) Given the financial burden of heart transplantation, it is not unreasonable to assume that this financial burden may change the financial security for caregivers and recipients over the recipient’s lifetime with a heart transplant. Thus, it is important to understand what impact heart transplantation may have on health insurance coverage over time. Transitions in health insurance coverage may be associated with worse or improved outcomes that could result in biased optimistic or pessimistic estimates compared with analyses only considering the type of insurance present at the time of transplant listing. Such transitions could also serve as an indicator for increased surveillance by providers so that additional resources could be identified to optimize patient outcomes.

Addressing this issue, Tumin et al\(^9\) examined the influence of health insurance trajectories or transitions on long-term
survival after heart transplantation. The investigators examined data from the United Network for Organ Sharing (UNOS) registry and identified 10298 first-time heart transplant recipients between the ages 18 and 64 years from July 2006 through December 2013. Patients surviving >1 year were categorized according to health insurance trajectories (ie, public versus private) and were grouped as follows: (1) continuous private coverage; (2) continuous public coverage; (3) transition from private to public insurance; (4) transition from public to private; (5) multiple transitions between public and private insurance; (6) any trajectory involving other insurance types; and (7) trajectories with missing data. For most transplant recipients, ≈71%, no transitions in health insurance status occurred with 44% having continuous private coverage and 27% having continuous public coverage. Transition from private to public coverage occurred in 11%, whereas few patients (3%) experienced multiple transitions between public and private insurance. Patients with continuous private health insurance were more likely to be of white race, to have completed college, and to reside in a ZIP code in the top quintile of median household income. In a multivariable analysis of conditional survival (survival contingent on surviving 1-year post-transplant), continuous public health insurance and transition from private to public health insurance were associated with increased mortality hazard relative to continuous private health insurance. Relative to continuous public health insurance, the transition to private health insurance was associated with lower mortality hazard. Importantly, to further distinguish the effects between Medicare and Medicaid public insurance, a multivariable analysis was performed to compare continuous public health insurance and private-to-public trajectories by Medicare or Medicaid health insurance status at the time of the 1-year follow-up. In the continuous public health insurance group, an elevated mortality hazard relative to continuous private insurance was observed among patients who participated in either Medicaid or Medicare at the 1-year follow-up. For recipients who transitioned from private to public health insurance, the increase in mortality hazard reached statistical significance among those recipients who transitioned only to Medicaid but not for those who transitioned to Medicare.

The study by Tumin et al\textsuperscript{17} has many important observations. First, their findings reinforce previous observations that the necessity for public health insurance at heart transplant listing identifies a population at risk for worse heart transplant outcomes. This finding alone has broad implications on how policies regarding public health insurance need to be developed or revised to address current limitations in public health insurance and insure equivalent heart transplant outcomes compared with those with private health insurance coverage. Second, for the majority of patients, no transitions in health insurance occurred from the early time period from heart transplant listing to 1-year post-transplant. However, ≈1 in 5 patients did transition from private to public health insurance coverage. This observation is not totally unexpected because a significant number of patients do not return to full-time employment after heart transplantation and depend on permanent disability status to qualify for public health insurance.\textsuperscript{20} Healthcare policies that do not penalize recipients returning to employment may allow additional financial means to supplement public health insurance. Third, patients who transitioned from public to private insurance coverage did not have a mortality hazard significantly different from patients with continuous private insurance coverage. Although this may seem intuitive, previous studies in patients undergoing lung transplantation for cystic fibrosis found no survival benefit for patients transitioning from public to private insurance coverage.\textsuperscript{21} Last, the adverse effect of transitioning from private to public health insurance coverage on heart transplant survival seems to be restricted to those recipients who transition to Medicaid, but not Medicare public health insurance coverage. Although not specifically examined in this study, this last observation may provide some assurance to the group of recipients that transition from private insurance to Medicare by qualifying by age criteria and that this transition may not adversely influence heart transplant outcome. It is possible that weaker effects of health insurance status on mortality for patients >65 years of age would be observed. Including patients aged >65 years in the current study could have provided additional insight into this specific issue.

Limitations in the work by Tumin et al\textsuperscript{17} are present and are highlighted by recent work by these investigators.\textsuperscript{18} Foraker et al,\textsuperscript{18} in a recent analysis of the UNOS database, examined the influence of private or public health insurance coverage on 1-year and long-term survival after heart transplantation. The investigators identified regional geographic variations (UNOS regions) in the hazard mortality of public health insurance coverage on conditional heart transplant survival. When the investigators restricted the multivariable analysis to conditional survival (survival contingent on surviving the first year post-transplant), only 2 geographic regions, UNOS Region 10 and UNOS Region 11, had poor survival associated with public versus private health insurance. While not considering health insurance transitions in this study, it is likely that the influence of health insurance transitions on heart transplant outcomes may also have similar regional geographic variations. Thus, the findings of Tumin et al\textsuperscript{17} may not necessarily be broadly applied to all patients and regions of the United States. Other limitations of this study arise from the nature of research on large administrative and patient databases that include missing data, data entry errors, and limitations in variables collected in the database that contribute to residual confounding, despite appropriate statistical methodology.

The role of public health insurance coverage in providing heart transplantation services will likely increase and become a more dominant mechanism of health insurance coverage in the future. The work of Tumin et al\textsuperscript{17} and others has identified an important association between public health insurance coverage and inferior heart transplantation outcomes. Significant opportunities exist to improve the current system of public healthcare coverage for patients requiring organ transplantation to eliminate the inequities in patient outcomes.

Disclosures

None.

References


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