



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

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Long-term Economic Evaluation of Kidney Transplantation versus Dialysis: A 21-Year Nationwide Population-Based Analysis

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Objectives : We aimed to analyze the long-term economic trajectory and identify the break-even point where the cumulative cost of KT becomes lower than that of maintenance dialysis using nationwide population-based data.

Methods : We identified KT recipients and dialysis patients from the NHIS database (2002-2023). To ensure comparability, exact 1:1 matching was performed. A total of 10,740 matched pairs were analyzed. Annual and cumulative direct medical costs were tracked for up to 16 years, including 5 years of pre-index expenditure.

Results : In the first post-transplant year, KT recipients incurred higher annual costs compared to dialysis patients (\$30,295 vs. \$20,623; $p < 0.001$). However, starting from the second post-transplant year, annual costs for dialysis patients were significantly higher. The cost ratio was 2.76 within the second post-transplant year (\$23,893 vs. \$8,694) and widened to 3.53 within the fourth post-transplant year (\$27,488 vs. \$7,837; $p < 0.001$). When evaluating cumulative costs starting from five years pre-index, the economic break-even point was reached within the third post-transplant year, where the total expenditure for the dialysis group (\$112,001) surpassed that of the KT group (\$105,985; $p < 0.001$). Subgroup analysis revealed that 54.9% of KT recipients achieved an early break-even within the third post-transplant year. Compared to the late break-even group, this early group was significantly younger (mean 47.5 vs. 50.2 years), had a significantly lower comorbidity burden (CCI ≤ 2 : 25.3% vs. 16.4%), and a higher proportion of patients in the highest income quintile (34.9% vs. 29.1%).

Conclusions : KT demonstrates long-term economic efficiency, offsetting high initial costs within the third post-transplant year compared to dialysis. Patients with lower age and comorbidity burden achieve financial benefits more rapidly. These findings provide a strong economic rationale for prioritizing KT to ensure the long-term sustainability of healthcare resources.