

Shortened Length of Stay Improves Financial Outcomes in Living Donor Kidney Transplantation

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Int J Angiol 2013;22:101–104.

Abstract

Keywords

- ▶ kidney transplantation
- ▶ postoperative protocols
- ▶ transplant outcomes
- ▶ economic outcomes
- ▶ arithmetic analysis

Kidney transplantation is the preferred clinical and most cost-effective option for end-stage renal disease. Significant advances have taken place in the care of the transplant patients with improvements in clinical outcomes. The optimization of the costs of transplantation has been a constant goal as well. We present herein the impact in financial outcomes of a shortened length of stay after kidney transplant.

The optimal utilization of resources has become a standard goal in modern clinical practice. Currently, this issue has acquired even more relevance given the economic and political scrutiny applied to our health care system. The goal is optimization of resources without harming patient care. It is known that the cost of the initial surgical intervention and hospitalization makes most of the expenses associated with kidney transplant. Consequently, any intervention that shortens the length of stay after transplant will decrease the costs. Here, we present the financial impact of a strategy of shortened length of stay after kidney transplantation.

Aim

The purpose of our study was to evaluate the financial impact of a shortened length of stay after kidney transplant.

Patients and Data

Data corresponding to 104 consecutive living donor kidney transplant recipients were obtained from the Physician

Activity and Outcome Report developed to standardize physician performance. Patients were evaluated and treated according to a multidisciplinary continuum protocol that allowed for the safe inpatient to outpatient transfer of care as early as 48 hours after the kidney transplant. Discharge criteria included hemodynamic stability, adequate urine output, no urinary catheters, satisfactory oral intake, no intravenous fluids, decreasing creatinine, social support, ability to take immunosuppression, no major complications, and controlled comorbidities. Outpatient transplant clinic follow-up was within 48 hours.

Results

Patient satisfaction (Press Ganey) scores ranked in the 99% with respect to peers. There was no increased morbidity resulting from discharge after 48 hours. There were no transplant surgery-related readmissions within the first 7 days after transplantation. Geometric and arithmetic analyses are shown in ▶ **Table 1**.

published online
April 18, 2013

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Tel: +1(212) 584-4662.

DOI <http://dx.doi.org/10.1055/s-0033-1334139>.
ISSN 1061-1711.

Table 1 Geometric and arithmetic analyses

	Observed (O)	Expected (E)	Variation	O/E	Statistical significance
Mortality	0.00%	0.18%	- 0.18%	0.00	
Geometric LOS	2.62	5.60	- 2.98	0.47	99% confidence level
Geometric charge/case	\$113,376	\$141,894	\$28,518	0.80	99% confidence level
Geometric cost/case	\$39,205	\$76,160	\$36,955	0.51	99% confidence level
Arithmetic LOS	2.87	5.75	- 2.88	0.50	99% confidence level
Arithmetic charge/case	\$119,660	\$152,449	\$32,789	0.78	99% confidence level
Arithmetic cost/case	\$42,051	\$85,254	\$43,204	0.49	99% confidence level

Abbreviation: LOS, length of stay.

Discussion

Kidney transplantation is superior to renal replacement therapy as treatment for end-stage renal disease (ESRD). It offers improved survival and quality of life, with long-term mortality rate between 50 and 80% lower for transplant patients compared with those on dialysis.¹ This improved survival varies between living donors, deceased donors, and expanded criteria donors²; however, all three groups still have lower mortality than dialysis patients. The estimated quality-adjusted life-year gain may be 2 to 3.5 when transplant patients are compared with dialysis patients.³

ESRD care benefits not only the patients but also the health system from a cost and resource utilization point of view. The cost of ESRD care is around 6.4% of the Medicare budget, 25 billion in 2009 which is more representative if it is considered that ESRD patients represent less than 1% of beneficiaries.⁴⁻⁷ The costs associated with kidney transplantation are similar to those associated with dialysis during the first year posttransplant, but by the second year after the transplant, the costs are around 40% of the annual costs of dialysis. In fact, the comparative cost saving increases overtime. The economical advantage has been observed in all types of kidney transplants, deceased donor, extended criteria deceased donor, open living donor, and laparoscopic living donor.^{3,8-11}

Several areas of improvement have been identified and specific measures have been undertaken which have allowed better outcomes and superior patient satisfaction. Examples include the identification of preoperative factors affecting outcomes, refinement of surgical technique, and establishment of standardized clinical pathways and protocols for postoperative care. These have helped to decrease the initially high costs of the transplantation which stem from the surgical procedure and hospitalization.

Preoperative Factors

Specific factors have been identified, which increase the length of stay after kidney transplant. Although some of them are nonmodifiable, it is accepted that optimization of medical condition, careful selection, and matching of donors and recipients will improve the outcomes and decrease the length of stay and in consequence the costs and resource utilization.¹²⁻¹⁵

Surgical Technique

The refinement of the surgical technique and clinical knowledge allowed the evolution from deceased donor to expanded criteria donor to living related and unrelated donor. Although all these techniques have shown to be cost-effective when compared with renal replacement therapy, living donor kidney transplantation has shown to offer the best outcomes as well as been the most cost-effective.^{16,17}

Immunosuppressive Regimens

Development of immunosuppressive agents decreased the incidence of acute and chronic rejection improving graft survival. At the same time, these medications have shown to be cost-effective compared with older medications.¹⁸

Postoperative Care

The implementation of clinical pathways and standardized protocols for postoperative care in kidney transplant patients has shown reduced deviations from standard of care, higher compliance in early removal of urinary catheters and monitoring lines, decreased pain medication requirements, increased patient satisfaction, and decreased length of stay and costs with improved outcomes.¹⁹⁻²² It is our practice to use standardized postoperative care protocols to ensure excellent care with early discharge after 48 hours and quick transition to the outpatient transplant center.

There is still room for improvement; greater effort is required to increase the donor volume. Advances such as reduced stay for living donors, faster recovery for donor after laparoscopic nephrectomy should be advertised in educational programs. Recent studies have shown that poor recipient outcomes greatly affect living donor psychological health and depression.²³ Therefore, improved outcomes in recipients with minimal delayed graft function, shorter hospital stay, and increased satisfaction are all factors that may be used to motivate potential donors.

Conclusion

Kidney transplantation requires continuous rather than sporadic clinical and economic scrutiny to quantify areas in need of improvement. Its benefits can be further enhanced by maximizing cost-effectiveness in the setting of optimal safety, clinical outcomes, and patient satisfaction. A shortened

length of stay coupled with a multidisciplinary approach provides enhanced clinical and financial outcomes. In this specific model, providers and payers could benefit from cost savings of 3.70 to 4.32 million and charge savings of 2.85 to 3.28 million for every 100 patients. Continuous and steady refinement in efficiency will continue to improve both clinical outcomes and the economic advantage of kidney transplantation. Our report shows that short stay after kidney transplantation is feasible without additional risks for the patients, increases patient satisfaction, and decreases costs.

Note

The authors of this manuscript have no conflicts of interest to disclose and receive no special funding for this research. All research has been approved by the Institutional Review Board.

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