Recruitment of Live Donors by Candidates for Kidney Transplantation


University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania

Background: Little is known about efforts that renal transplant candidates make to recruit live donors. It was hypothesized that preference for live donor kidney transplantation and greater knowledge about live donor transplantation are associated with candidates’ initiating conversations about donation with potential donors.

Design, setting, participants, & measurements: A cross-sectional study of renal transplant candidates was performed at initial transplant evaluation. Candidates completed a questionnaire that specified whether they had initiated conversations about donation with any potential donors. The questionnaire also measured preference for live donor transplantation, knowledge about transplantation, concern about donor harm, willingness to ask for help in coping with kidney disease, and social support.

Results: Ninety-six candidates participated. Forty-nine (51%) reported initiating a conversation with at least one potential donor. In multivariable logistic regression, domains associated with initiating a conversation included: preference for live donor transplantation, willingness to ask for help, and female gender. Older age was associated with a lower odds of initiating a conversation. Knowledge, concern about donor harm, social support, and ethnicity were not associated with initiating a conversation with a donor.

Conclusions: Attempts at donor recruitment by kidney transplant candidates are common. These findings suggest that interventions that influence preferences about transplantation and willingness to ask others for help are logical targets to enhance access to live donor transplantation.

The alarming rise of end-stage renal disease (ESRD) in the United States has greatly increased the demand for kidney transplantation, a treatment modality that increases both life expectancy and quality of life compared with chronic dialysis (1). Given a limited supply of deceased donor kidneys, transplant professionals have increasingly focused their attention on live donor transplantation. Despite the fact that outcomes with live donor kidney transplantation are superior to outcomes after deceased donor transplantation, only a small proportion of transplant candidates receives a live donor transplant (2).

Little information exists about obstacles faced by transplant candidates in attempting to “recruit” live donors. Female gender and black ethnicity are associated with a decreased likelihood of receiving any kidney transplant; these groups, however, may face particular obstacles with regards to finding live donors (3–9). Reasons for these disparities are multifactorial. Proposed explanations for the decreased likelihood of women to receive a live donor kidney include low rates of donation by male spouses and relatives, and gender bias on the part of medical institutions (7,8,10).

An important barrier to live donor transplantation for black candidates may be the burden of kidney disease in the black population overall, such that a disproportionate amount of black patients need kidneys but the number of medically suitable black donors is limited (9,11,12). The creation of successful programs that maximize live donor transplantation would require a more detailed understanding of the barriers confronted by individual candidates when attempting to find donors. Proposed barriers include limited knowledge of the benefits of live donor transplantation, concern about donor harm, cultural, or religious beliefs, poor ability to cope with chronic kidney disease, and lack of social support (9,13–18).

Attempted donor recruitment is an important step toward live donor transplantation and a plausible surrogate endpoint in understanding factors that limit overall access to live donor transplantation. The purpose of this cross-sectional study was to identify characteristics of transplant candidates that are associated with attempts to recruit potential live kidney donors. We hypothesized that transplant candidates who expressed preference for a live donor kidney transplant and those with greater knowledge about transplantation would be more likely to attempt to recruit a potential live donor.

Materials and Methods

We conducted a single center, cross-sectional study of kidney transplant candidates that consisted of a single questionnaire administration
at the initial transplant evaluation in the renal transplant center at the Hospital of the University of Pennsylvania. Every candidate referred to our center for kidney transplantation is evaluated in this clinic. These patients are referred by hundreds of physicians within and outside of our institution, representative of our customary referral base. All transplant candidates coming for an initial visit were eligible. The center does not evaluate pediatric transplant candidates or prisoners. The project was approved by the University of Pennsylvania Institutional Review Board.

**Instrument Development**

On the basis of published literature and our clinical experience with transplant candidates, we identified a series of domains that were plausibly related to live donor kidney recruitment (14,19,20). Twenty semistructured interviews with transplant candidates were performed to understand the barriers to finding live donors that transplant candidates identify (Figure 1). These interviews were also used to refine and confirm the domains of our questionnaire. During these digitally recorded and transcribed interviews, transplant candidates were asked to discuss their knowledge and beliefs regarding live donor transplantation. The content of the transcriptions was analyzed to develop and refine items that composed the study questionnaire.

The initial questionnaire included items intended to measure the following domains: 1) preference for a live donor kidney transplantation, 2) knowledge about clinical outcomes with live donor kidney transplantation (9 items), 3) concern about harming the donor (2 items), 4) willingness to ask for help in coping with kidney disease (4 items), 5) beliefs about dialysis (2 items), and 6) social support (12 items). We developed original items to measure preference, knowledge, concern, willingness, and dialysis beliefs. To measure social support, we used with permission a previously developed instrument: the 12-item Multidimensional Scale of Perceived Social Support (21,22). These 12 items have a 7-point Likert-type scale for responses. Four items relate to support from family, 4 to support from friends, and 4 to support from a ‘special person.” This instrument had previously been tested in chronic kidney disease patients, hemodialysis patients, and kidney transplant recipients (23-25).

The knowledge items had a multiple choice or true/false format. The format of all other original items was a 5-point Likert scale, with choices ranging from “strongly disagree” to “strongly agree.”

Respondents were also queried regarding demographic and clinical characteristics, including age, ethnicity, gender, marriage or involvement with a significant other, income level, education, number of living siblings, number of living children, history of dialysis, prior renal transplant, and prior transplant evaluation. Cause of ESRD and medical comorbidities were abstracted from the electronic medical record.

We pilot tested the questionnaire with approximately 25 transplant candidates, with subsequent revisions. Additionally, the instrument was reviewed for content validity with transplant physicians, transplant coordinators, and a social worker.

**Outcome: Initiating a Conversation About Kidney Donation With a Potential Donor**

On the questionnaire, transplant candidates were asked to report the number of potential donors with whom they had initiated the conversations about donation. Initiation of a conversation about live donation with at least one potential donor was considered to be the primary outcome of attempted donor recruitment. (We refer to candidates who did and did not initiate a conversation as “initiators” and “noninitiators,” respectively.)

**Questionnaire Administration**

Before coming to clinic, transplant candidates had received in the mail basic literature about the transplant process at our institution. In clinic, candidates attended an educational session led by a transplant coordinator about outcomes for deceased and living donor renal transplantation. Later that day, the questionnaires were administered directly to transplant candidates by a trained research associate who was present to answer questions.

**Statistical Analysis**

**Principal components analysis.** Principal components analysis (PCA) is a statistical method of reducing complex data by identifying clusters of interrelated items. In this study, we used exploratory PCA to discover if our newly developed questionnaire items could be sorted parsimoniously into groups in which the responses to items within each group correlated with each other (26). We used PCA with all items initially in the preference, concern, willingness, and dialysis beliefs domains. We retained components for eigenvalues greater than 1 and examined the item loadings following rotation >0.3 (27). We did not include the knowledge items in the PCA because we believed that knowledge constituted a separate domain. PCA was not performed on the social support instrument because it had been previously tested by the original authors (21,22).
Internal consistency (reliability). The Cronbach’s alpha statistic estimates internal consistency: the degree to which items within a scale measure a single trait. Cronbach’s alpha is calculated by measuring the correlation between responses to a set of items (26). We used a cutpoint for Cronbach’s alpha of >0.5 as evidence of minimal acceptable internal consistency within a domain, with a goal alpha between 0.7 to 0.9 (26,27).

Domain scores. After completion of PCA, we developed a simple scoring system for the individual items within the preference, concern, willingness, and dialysis beliefs domains. Binary item responses were created in which responses of “agree” or “strongly agree” (indicating endorsement of the item) were scored 1 point and other responses were scored 0. Within each domain, the overall domain score was generated as the sum of individual item scores (28,29).

For the 5-item knowledge domain, a correct answer to each item was scored 1 point. For the social support domain, we followed the scoring system described by its original developers. Each response to an individual item on the 7-point Likert-type scale was converted to a score of 1 to 7. The 12 items were added together for a summary score of 12 to 84 (22).

Analysis of association with outcome. The means of normally distributed variables were compared between initiators and noninitiators using the t test. For non-normally distributed variables, comparisons between these 2 groups were made using the Wilcoxon rank sum test. Categorical attributes were compared between these 2 groups by χ², or by Fisher’s exact when an individual cell size was <.5. A logistic regression model for the outcome of initiating a conversation was fit in which variables that had significant unadjusted association in univariate analysis (P < 0.15) were entered into the model.

Sample size. We chose a 1-point difference in score on the preference domain or the knowledge domain to be clinically significant because a transplant center would be unable to detect a smaller increment in a single candidate on the basis of the questionnaire. For the preference domain, a 1-point difference corresponds to a change from agreement to neutral or disagreement on an item, whereas for the knowledge domain, a 1-point difference corresponds to an additional correct answer (26,30). On the basis of preliminary data suggesting that one third to one half of participants would meet our primary endpoint, we estimated that approximately 90 patients would be required. This number was also adequate to perform PCA on the questionnaire (31).

Statistical software. Analyses were performed using STATA (Stata 9.0, Stata, College Station, TX).

Results

During a 4-mo period from August 2006 to December 2006, a total of 123 renal transplant candidates came for initial transplant evaluation and were eligible to participate in the study. Ninety-six patients (78% of total eligible) were enrolled; reasons for refusal to participate were not collected. Nonparticipants resembled participants in terms of ethnicity and gender. Nonparticipants were slightly older (57.4 yr versus 51.8 yr for participants, P = 0.10), although this difference did not reach statistical significance.

The demographic and clinical attributes of study subjects are presented in Table 1. Sixty patients (63%) were male. Forty-nine (51%) were white and 35 (36%) were black. Sixty-four (67%) were married or had a significant other. The median education level reported by participants was having attended college, but not having received a degree.

Performance Characteristics of the Instrument

We relied on PCA and iterative reliability testing to trim items and further define domains (26,32).

Table 1. Demographic and clinical attributes of renal transplant candidates (n = 96)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>No.</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (standard deviation)</td>
<td>51.8 yr</td>
<td>(12.5)</td>
</tr>
<tr>
<td>Male (%)</td>
<td>60</td>
<td>(63)</td>
</tr>
<tr>
<td>Ethnicity (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>white</td>
<td>49</td>
<td>(51)</td>
</tr>
<tr>
<td>black</td>
<td>35</td>
<td>(36)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>3</td>
<td>(3)</td>
</tr>
<tr>
<td>Asian</td>
<td>3</td>
<td>(3)</td>
</tr>
<tr>
<td>Native American</td>
<td>1</td>
<td>(1)</td>
</tr>
<tr>
<td>other</td>
<td>4</td>
<td>(4)</td>
</tr>
<tr>
<td>Spouse or significant other (%)</td>
<td>64</td>
<td>(67)</td>
</tr>
<tr>
<td>Median stratum of living children</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Median stratum living siblings</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Median education</td>
<td>Attended college, no degree</td>
<td></td>
</tr>
<tr>
<td>Median annual household income</td>
<td>$25,000–$49,999</td>
<td>(52)</td>
</tr>
<tr>
<td>Dialysis (%)</td>
<td>50</td>
<td>(14)</td>
</tr>
<tr>
<td>Prior renal transplant (%)</td>
<td>13</td>
<td>(31)</td>
</tr>
<tr>
<td>Prior transplant evaluation (%)</td>
<td>30</td>
<td>(36)</td>
</tr>
<tr>
<td>Diabetes (%)</td>
<td>35</td>
<td>(16)</td>
</tr>
<tr>
<td>Hypertensive nephrosclerosis (%)</td>
<td>15</td>
<td>(14)</td>
</tr>
<tr>
<td>Glomerulonephritis (%)</td>
<td>13</td>
<td>(10)</td>
</tr>
<tr>
<td>Polycystic kidney disease (%)</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
Principal components analysis. The PCA identified 2 components. All items expressing preference for a live donor kidney transplant were associated with component 1 with loading after rotation >0.56. The items expressing concern about donor harm and willingness to ask for help were associated with component 2 with loading after rotation >0.33. We kept the concern and willingness domains separate for analytic purposes, however, because prior literature and our preliminary interviews suggested that they reveal distinct information about the beliefs of transplant candidates.

The items relating to dialysis were not clearly associated with either factor. Additionally, these items yielded a low Cronbach’s alpha (0.40). We dropped the dialysis domain from further analysis (33).

Internal consistency. The Cronbach’s alpha for the 3-item preference domain was 0.76. The 2-item concern domain yielded an alpha of 0.61. The 4-item willingness domain yielded an alpha of 0.76.

The original 9-item knowledge domain yielded an alpha of 0.43. When we evaluated 4 items related to immunology and histocompatibility, the alpha rose to 0.57. To address possible concerns that knowledge scores would be confounded by education, we used the Wilcoxon rank sum test to assess the relationship between knowledge and self-reported education. Knowledge was not strongly associated with education (P = 0.27). Knowledge score was associated with having had a prior kidney transplant (prior transplant score 4.2 versus 3.3 for no prior transplant, P = 0.02). Knowledge was also associated with having had a prior transplant evaluation (prior evaluation score 4.0 versus 3.2 for no prior evaluation, P < 0.01).

The 12-item social support domain items yielded a Cronbach’s alpha of 0.95. The social support items had a mean total score of 69 ± 14 (out of a possible 84 points); the median was 72. As expected, having a spouse or significant other was associated with a higher social support score (P = 0.02). The association between parenthood and social support approached conventional levels of statistical significance (P = 0.11).

After this examination of the instrument’s domains, five were retained in the analysis: preference, knowledge, concern, willingness, and social support. The final items are provided in Table 2.

Missing data. Regarding the final domain items, <5% of responses were missing. Among demographic questions, <5% of overall responses were missing, with the exception of the income question. Eight candidates (8%) did not specify income.

Talking to any donors. Seventy-five (78%) transplant candidates reported discussing donation with at least 1 potential live kidney donor. Among candidates who discussed donation with any potential donors, the mean number of donors to whom they talked was 4.5 ± 4.0. Twenty-one candidates (22%) reported refusing an offer of donation from a potential donor.

Primary outcome. Initiating a conversation about donation with a potential donor, 49 (51%) candidates reported initiating a conversation about kidney donation with at least one live donor.

Univariate analysis of donor recruitment. Results for the univariate analyses for the 5 domains are summarized in Table 2. Preference for a live donor transplant was strongly associated with initiating a conversation with a potential living donor. Initiators had a higher mean preference score than noninitiators (2.0 versus 1.2, P = 0.0002). In particular, individual responses to the item which asked candidates to respond to the statement “I would prefer a living kidney transplant compared with a transplant from someone who has died,” showed that 39 patients (40%) either agreed or strongly agreed with the statement. In univariate analysis, agreement or strong agreement with this individual item was also associated with initiating conversations with potential donors (odds ratio [OR] = 3.6; 95% confidence interval [CI], 1.5 to 8.4; P = 0.003).

The willingness domain was also associated with initiating a conversation. Initiators had a higher mean willingness score than noninitiators (2.7 versus 1.8, P = 0.0007). Older age was associated with a lower odds of initiating a conversation about donation (OR = 0.58 per 10 yr increase in age; 95% CI, 0.40 to 0.83, P = 0.004). We also analyzed age as 4 dummy variables based on the overall age distribution (age <40 yr, age 40 to 50 yr, age 50 to 60 yr, and age >60 yr). In this analysis, increasing age had an increasingly negative association with initiating conversations until age 60. Above age 60, the association remained stable.

Initiators did not have a higher mean knowledge score than noninitiators (3.6 versus 3.2 points, P = 0.11). Initiating a conversation about donation was also not associated with the concern domain (OR = 0.8, P = 0.36) or social support (OR = 1.0, P = 0.72). None of the other clinical or demographic variables explored was significantly associated with initiation of conversations, including nonwhite ethnicity (P = 1.0), history of dialysis (P = 0.83), income (P = 0.83), number of living siblings (P = 0.78), having a spouse or significant other (P = 0.773), number of living children (P = 0.50), history of prior evaluation or transplant (P = 0.37), diabetes (P = 0.22), or female gender (P = 0.13).

Multivariable logistic analysis of initiating conversations with potential donors. We next performed multivariable logistic regression using the 5 variables that had P values <0.15 in univariate analysis: preference, willingness, knowledge, age, and gender. These results are shown in Table 3.

Preference remained significant (OR = 2.08 for every 1 point increase in domain score, 95% CI, 1.27 to 3.41, P = 0.004). Willingness to ask for help remained significant (OR = 1.70 for every 1 point increase in score, 95% CI, 1.15 to 2.52, P = 0.008). Increasing age remained associated with a lower odds of initiating a conversation with a potential donor (OR = 0.62 per 10 yr increase; 95% CI, 0.41 to 0.93, P = 0.021). Female gender was also associated with initiating a conversation (OR = 2.94; 95% CI, 1.02 to 8.46, P = 0.045).

Knowledge was not significant (OR = 1.18 for every 1 point increase in score; 95% CI, 0.82 to 1.71, P = 0.38) and removing it from the model did not substantially change the results for the other variables.

To further explore the possible impact of a prior transplant or transplant evaluation on the outcome, we also forced this patient characteristic into the regression. Prior transplant or eval-
valuation was not significant and did not substantially change the associations for the other independent variables.

Discussion

Given the ever-growing transplantation wait-list and the high mortality of chronic kidney disease, efforts to understand barriers to appropriate live donor kidney transplantation are of paramount importance. We identified four attributes of renal transplant candidates (preference for live donor transplantation, willingness to ask for help in coping with kidney disease, age, and gender) that were associated with initiating a conversation with a potential live donor about donation. The strong relationships of the preference and willingness domains with initiation merit particular attention because it is possible that these characteristics could be influenced by educational interventions.

Table 2. Comparison of domain scores between transplant candidates who did and did not report initiating a conversation about kidney donation with potential donor(s)

<table>
<thead>
<tr>
<th>Initiated Conversation About Donation</th>
<th>Yes</th>
<th>No</th>
<th>P&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Preference Score (possible range, 0-3)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.0</td>
<td>1.2</td>
<td>0.0002</td>
</tr>
<tr>
<td>1. I would prefer a living kidney transplant compared to a transplant from someone who has died.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. If a living donor offered to donate a kidney to me, I would accept the offer.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I think that I will get a living person to offer to donate a kidney to me.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Knowledge Score (possible range, 0-5)</td>
<td>3.6</td>
<td>3.2</td>
<td>0.11</td>
</tr>
<tr>
<td>4. On average, patients who receive a kidney transplant from a living donor:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. wait longer for the transplant compared to patients who receive a kidney from someone who has died</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. wait the same length of time for the transplant compared to patients who receive a kidney from someone who has died</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. wait less time for the transplant compared to patients who receive a kidney from someone who has died</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Concern Score (possible range, 0-2)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.1</td>
<td>1.0</td>
<td>0.382</td>
</tr>
<tr>
<td>9. I am worried that a living person who donated a kidney to me would develop health problems.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. My worries about health problems from kidney donation keep me from asking others to donate a kidney to me.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Willingness Score (possible range, 0-4)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.7</td>
<td>1.8</td>
<td>0.0007</td>
</tr>
<tr>
<td>11. In general, I feel comfortable asking for help when I have a problem.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I feel comfortable letting family and friends know that I have kidney disease.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I would feel comfortable asking a healthy family member to donate a kidney to me.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. I would feel comfortable asking a healthy friend to donate a kidney to me.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Social Support Score (21,22)&lt;sup&gt;c&lt;/sup&gt; (possible range, 12–84)</td>
<td>69</td>
<td>69</td>
<td>0.72</td>
</tr>
</tbody>
</table>

<sup>a</sup>P values correspond to univariate analysis using Wilcoxon rank sum test.

<sup>b</sup>Items from the preference, concern, and willingness domains had 5-point Likert response scales ranging from "strongly disagree" to "strongly agree," which were scored in a binary fashion.

<sup>c</sup>Social support domain items had 7-point Likert scales ranging from "very strongly disagree" to "very strongly agree."
The domain of willingness to ask for help in coping with kidney disease may have measured our subjects’ general openness toward asking others for help in times of need. In our semistructured interviews, for instance, a substantial proportion of candidates reported that they were unwilling to request that potential live donors go for evaluation and that this unwillingness stemmed from a personal reluctance to ask others to make sacrifices for them.

The reasons why increasing age was associated with a lower odds of attempted donor recruitment are uncertain. One possible explanation is that older candidates are unwilling to ask young donors because of an appreciation that young donors have a long life expectancy during which they might develop medical problems that could be complicated by prior nephrectomy. Our observation corroborates that of Zimmerman et al., who studied transplant candidates undergoing evaluation and patients wait-listed for a deceased donor kidney and found that older age was associated with a lesser willingness to consider live donor transplantation (34).

The positive association of female gender with initiating a conversation with a potential donor offers a potentially important insight into the disparity that women face in obtaining kidney transplants. Despite prior studies showing that women are less likely to receive live donor transplants, women in our study were more likely to seek a live donor through initiating a conversation than men were (7,8,37). This finding suggests that the obstacles faced by women are not the result of unwillingness to approach a donor but may instead be related to higher levels of sensitization, donor factors, or the relationships between female candidates and potential donors.

Contrary to our hypothesis, we did not find that knowledge about live donor transplantation was associated with attempts at donor recruitment. This finding suggests that the decision to discuss donation with potential donors is based on emotion or other factors and is not strongly influenced by knowledge about transplantation outcomes. In a study of black patients with ESRD, Boulware et al. also found no association between knowledge about live donor transplantation and discussion of this option with their nephrologists (16). Alternatively, it is possible that our study was not adequately powered to detect a small difference in knowledge between initiators and noninitiators. The absolute difference in knowledge scores between initiators and noninitiators in our study was 0.4, however, which represents less than half a question and is not clinically significant when considered on the level of an individual transplant candidate.

Further studies should explore whether characteristics identified in this study, such as preference for live donor kidney transplantation, could be affected by interventions aimed at increasing live donor transplantation. Although there is a dearth of published studies of interventions to increase live donor transplantation, Rodrigue et al. published a recent clinical trial that randomized renal transplant candidates to home-based education about live donor transplantation performed by a health educator (38). After a single home-based intervention, transplant candidates were more likely to express willingness to talk to potential donors, to have more potential live donor

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female gender</td>
<td>2.94</td>
<td>1.02–8.46</td>
<td>0.045</td>
</tr>
<tr>
<td>Preference domain</td>
<td>2.08</td>
<td>1.27–3.41</td>
<td>0.004</td>
</tr>
<tr>
<td>Willingness domain</td>
<td>1.70</td>
<td>1.15–2.52</td>
<td>0.008</td>
</tr>
<tr>
<td>Knowledge domain</td>
<td>1.18</td>
<td>0.82–1.71</td>
<td>0.380</td>
</tr>
<tr>
<td>Age (per 10 yr)</td>
<td>0.62</td>
<td>0.41–0.93</td>
<td>0.021</td>
</tr>
</tbody>
</table>

*Results are from multivariable logistic regression.*
evaluated, and to undergo live donor renal transplantation. The home-based educational session may have enabled transplant candidates to feel more comfortable asking about live donor transplantation or may have reinforced information received in the clinic visit. Interventions such as this one may also enable transplant candidates to pose questions about potentially sensitive issues, such as those regarding culture or ethnicity. Other options for interventions to change the preferences or beliefs of transplant candidates might include coaching of transplant candidates about how to talk to donors, or education with interactive multimedia approaches. Interventions outside of renal transplantation, for instance, have used interactive computer software to change knowledge and attitudes about areas of health such as smoking cessation and diabetes care (39,40).

Our study used a novel endpoint and measured relevant attributes but has several limitations. First, the study had a cross-sectional design. The attributes and the outcome were measured concurrently at a single transplant visit, making assessment of causal relationships difficult. For instance, we showed that preference for live donor transplantation was associated with initiation of a conversation with a donor. A candidate’s preference for live donor transplantation, however, might have changed by the time the questionnaire was administered because a potential donor had already expressed an interest in donating. Second, the content of conversations between transplant candidates and potential donors about donation could not be verified.

Another shortcoming of our study was sample size. A larger sample size might have been able to detect smaller differences in domains or might have detected small differences in subgroups not found in our study.

The possibility of unmeasured confounders and effect modifiers must also be considered. For example, other authors have considered whether religious or cultural reservations about living donation are barriers to live donor transplantation (13,16). When we explored these issues in our semistructured interviews, however, no candidates identified religious or cultural beliefs as important barriers. We think that the complementary steps of reviewing existing literature on live donor transplantation, performing interviews, and developing an original questionnaire maximized our likelihood of including the most relevant social, demographic, and clinical factors related to live donor recruitment.

The generalizability of our findings must also be placed in the context of a single center study. Our center typically performs about approximately 170 kidney transplants per year, of which 50% to 40% are from live donors. The center is located in an urban area in the eastern United States, serves an ethnically diverse population, and draws transplant candidates from several nearby states. Were centers with different geographic and demographic features to replicate this study, their findings might not resemble ours.

Conclusion

In our study of kidney transplant candidates, preference for a live donor transplant, willingness to ask for help in coping with kidney disease, and female gender were associated with initiating a conversation about donation with a potential live donor. Increasing age had a negative association with the outcome. The study demonstrates that that recruitment of live donors is an active process for many transplant candidates. These candidate attributes should be further examined to determine if they predict other important endpoints, such as actual live donor transplantation. The preference and willingness domains may also offer opportunity for interventions.

Acknowledgments

The authors thank John Stewart, MD, for his help in recruiting subjects for the study. Portions of these data were presented in abstract form at the American Transplant Congress, May 2007.

Disclosures

None.

References


