

Is There a Bias Against Women in Kidney Transplantation Practices in Saudi Arabia?

To the Editor:

Literature from around the world confirms the gender bias in kidney transplant practices in favor of male recipients [1-3]. It has often been shown that worldwide, there are more female kidney donors and fewer female recipients of living-related, spousal, or cadaveric renal transplants [1-11]. In addition to the social implications of that discrepancy, kidneys from male donors have a better survival rate and are less often rejected than are those from female donors [12]. In a report from Sweden, the kinship between donor and recipient was noted to be parents to children in 58 % of cases, sibling to sibling in 34% of cases, and offspring to parent in 1% of cases [10]. In another report from the United States, donors were found to be a sibling of the recipient in 45% of cases or a parent in 31%, but never offspring [13]. We investigated both gender and age bias in kidney transplant practices in the Kingdom of Saudi Arabia and speculated about the reasons for which such biases differ from those in Western countries. We also examined the kinship between donors and recipients of living-related kidney transplants.

Patterns in Age and Gender Bias

We investigated the pattern of gender and age bias in 2090 transplant patients over a 5-year period (between 2001 and 2005). Data on these patients were obtained from the registry of the Saudi Center of Organ Transplantation (SCOT), in which current records of all patients who undergo transplantation in the Kingdom of Saudi Arabia or abroad are maintained [14]. Of those 2090 patients, 693 had received a kidney from a living-related donor (LRD), 912 had received a transplant from a living-unrelated donor (LUD) (those patients underwent transplantation abroad because that type of transplantation is not permitted in the Kingdom of Saudi Arabia), and 485 had received a kidney from a deceased donor (DD).

The sex of recipients of a kidney from an LRD, an LUD, or a DD was recorded. In addition, we studied male-to-female donation and female-to-male donation in the patients who received a kidney from an LRD, the kinship of donors to recipients of a kidney from an LRD, and the age of donors and recipients at the time of transplantation. These findings were compared with the age and sex of patients on the waiting list of the SCOT.

Expected male and female kidney recipient ratios were based on the published prevalence of end-stage renal disease (ESRD) in men and women as listed in the 2004 SCOT annual report (52% male recipients and 48% female recipients). Analyses comparing observed and expected proportions of gender combinations were performed as described previously by Kayler and colleagues [15]. Expected recipient proportions were based on the published incidence of ESRD in men and women from 2001 through 2005 as published in the SCOT annual report.

The potential donor pool was calculated from the Saudi population census of 2004 [16]. In that calculation, the male and female potential donor pool in the age range of 18 to 65 years was considered. That age range was selected because most LRDs are within this age range, and we assumed that the expected proportions of donation would mirror that age range in the general population. Comparisons of actual and expected proportions of donation were performed with the chi-square test for 2×2 contingency tables.

Observed Versus Expected Results

Of all cross-gender donations, female-to-male donation of living-related transplants occurred in only 30% of cases, but male-to-female donation was recorded in 70% of cases (expected frequency, 23.5% and 26.5%, respectively; $P < .05$). Sixty-nine percent of all LRDs were men, and 31% were women. When compared with the expected donor gender frequency (51.2%), that difference was highly significant ($P < .01$). This discrepancy could not be explained by the exclu-

sion of potential female donors for medical or immunologic reasons, because similar numbers of male or female donors were excluded for those reasons. Fifty-two percent of those who received a kidney from a DD were men, and 48% were women. Women accounted for 48% of those waiting for a transplant on the SCOT registry list ($P = \text{NS}$). In the LUD group, however, 70% of the recipients were men, and only 30% were women. When compared with the expected values according to the waiting list, that difference was not significant.

We also found that the observed frequency of LRDs between the age of 18 and 45 years was 84.6% and that of LRDs between 46 and 55 years was 15.2% (expected frequency, 72.2% and 7.7%, respectively; $P = \text{NS}$). However, the observed frequency of the living-donor kidney recipients between the age of 18 and 45 years was 53.8% and that of living-donor kidney recipients between 46 and 55 years was 30.4% (expected frequency, 72.2% and 7.7%, respectively; $P = .001$).

Renal Donation and Kinship

Donation from siblings constituted the highest percentage of first-degree relative donations (53.2%), followed by donation from offspring (29.2%). Parents accounted for only 17.6% of the total living first-degree related donations. More brothers (35.2%) than sisters (17.6%) were donors. When compared with the expected frequency of sibling donors, that difference was significant ($P < .05$). More sons (17.6%) than daughters (7%) donated. When compared with the expected frequency of donations from sons versus daughters, that difference was significant ($P < .05$). There was no significant difference between the frequency of paternal (9.4%) versus maternal (8.2%) kidney donors.

Comment

Numerous previous reports have shown that women are less likely than men to be offered renal transplants from a living donor or a DD [1-8]. Research worldwide has shown that (even after controlling for age, panel reactive antibody level, income, and ethnic background) women were 28% less likely to receive a kidney transplant than were men [1,7]. A study of more than 6000 living-related transplantations in the United States revealed that women were 28% more likely than men to be a donor and were 10% less likely to receive a living-related kidney transplant than were men [3]. The predominance of female-to-male donation was found to be 86% in Turkey and 73% in the United States [8, 17].

The gender bias

The reasons for the gender bias in kidney transplantation practices are multifactorial and include the admission policy for renal replacement therapy programs and prioritization on the waiting lists for a kidney from a DD. Some authors have suggested that clinicians' biases against women may have a part in that selection [18-21, 4, 5]. Similar findings were reported in Australia, Sweden, and Canadian registries [19, 22, 23]. Immunologic and medical factors had only a minor part in that bias [3].

It has been shown that a positive attitude toward kidney donation and a self-inspired willingness to donate are more common in women than in men [16, 24, 25]. Simmons and colleagues [24] found that when compared with men, women were more likely to perceive renal donation as an extension of their obligation to their family. Men, on the other hand, were more likely to be ambivalent about donating a kidney. In addition, men who donated a kidney were more likely to believe that they had done something heroic than were women donors. Perhaps another explanation for the gender bias is that women are thought of as being more dispensable for economic reasons. In another study, the predominance of women among spousal donors was not found to be the result of pressure exerted by husbands who compelled their wife to donate. Instead, the wife appeared to be truly willing to donate a kidney to her husband to ease the negative impact of his illness on the family [17].

In Saudi Arabia, the incidence of more male than female kidney donors may result from a number of factors, such as a general societal feeling that women are vulnerable and fragile, or from concerns about the effect of kidney donation during pregnancy, the result of the procedure on an existing marriage, or the possibility that unmarried women donors may be perceived as unmarriageable. Islamic teaching about the importance of looking after women may be yet another factor. That view, however, may not apply in all Islamic countries, some of which (such as Turkey) [11] demonstrate a clear bias in favor of men (who are more often recipients and less often donors than are women), as do various Western countries.

Why, then, are there more male than female kidney donors in Saudi Arabia? Is there a more profound religious commitment in Saudi Arabia than in other parts of Islamic world? Is this bias associated more with traditional Saudi Arabian Bedouin tribal culture, which is overprotective of women, than with religious teachings? Is it simply because in Saudi Arabia (as opposed to other Islamic countries), there is a better economic safety net that renders imagined financial loss by donors a nonissue?

We found that unlike transplantation from an LRD or a DD, kidney transplantation from an LUD was more common in Saudi men than in Saudi women. We must emphasize that all LUD transplants are performed abroad on a commercial basis, which requires either the ability to pay for the procedure or the ability to persuade a sponsor to pay for the transplantation. The preponderance of male recipients of a kidney from an LUD may occur because in Saudi Arabia, men are more vocal than are women and can better persuade transplant sponsors, men are more educated than women, and/or men are wealthier than women.

Age-related bias

The disparity between the age of the Saudi donors and recipients and their Western counterparts is interesting [9, 10, 13]. Most of the kidney donors in Saudi Arabia are younger than those in the West. Only 9.1% of Saudi male donors were 50 to 70 years old, but 48% of the male donors in Sweden were in that age range [10]. Conversely, the Saudi kidney recipients were older than those in some Western countries [9, 13], perhaps because although Saudi kidney donations were found to be primarily from offspring to parents or from sibling to sibling, the predominant type of renal donation in the West was that of parent to child [13]. This difference could be explained by socioreligious and cultural differences between Eastern and Western societies. In the West, the feeling of parental responsibility for the welfare of their young children predominates, but in Saudi Arabia, the expected religious societal duty of children toward their parents is the predominant factor [25].

Conclusions

The results of our study revealed that in the Kingdom of Saudi Arabia, LRDs tend to be younger than their counterparts in the West and that donation from a sibling or offspring occurs more frequently (as does male-to-female donation) than in Western countries. We suggest that these findings and their causes should be investigated by prospective observations in additional studies.

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