Women Donate, Men Receive: Gender Disparity among Renal Donors

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ABSTRACT. In living donor kidney transplantation, a predominance of female-to-male donations has been observed. This gender disparity is more so in developing countries and requires targeted counseling and research to understand whether the cause is medical or sociocultural obstacles. The aim of this study was to analyze all living donor kidney transplants performed at a tertiary care center catering to patients of varied socioeconomic backgrounds. This was a retrospective cohort study of all 600 kidney donors who underwent donor nephrectomy at a single transplant center, Mahatma Gandhi Hospital, Jaipur, between 2013 and November 2018. Patient characteristics including gender, age, and relationship between donors and recipients were obtained. There was a significant increase in the amount of voluntary renal donations, almost doubling every year. Majority (78%) of the donors were females, whereas males contributed to 22% of renal donations. We observed that mothers were the highest number of donors accounting for 181 donations (n = 600), followed by wives who contributed to 102 of the renal donors (n = 600), and 98 (16.3%) fathers donated to their children. Fifteen percent of the donors donated kidney to their siblings. We found gender disparity in living donor kidney transplant in a single center that caters to a population of varied cultures and socioeconomic backgrounds. We anticipate these results will guide clinicians and living donor coordinators and lead to appropriate counseling for patients and potential donors.

Introduction

As the demand for kidney transplantation, particularly from living donors, continues to interest in outlining the demographic profile of rise, there is an increasing and much needed these renal donors.\textsuperscript{1,2} Developing countries such as India have witnessed an increase in the number of voluntary donors, especially females.\textsuperscript{3} This gender disparity is seen more in developing countries and requires targeted counseling and research to understand whether the cause is medical or sociocultural obstacles.\textsuperscript{4} The aim of this study was to analyze all living donor kidney transplants performed at our institution, which caters to people of varied communities and socioeconomic backgrounds.

Materials and Methods

This was a retrospective cohort study of all
600 kidney donors who underwent donor nephrectomy at a single transplant center (Mahatma Gandhi Hospital, Jaipur) between 2013 and November 2018. Patient demographics including gender, age, and relationships between donors and recipients were obtained.

**Results**

**Demographics and gender relationships**

There were 600 donor kidney transplants conducted at Mahatma Gandhi Hospital, Jaipur, between 2013 and November 2018. Tables 1 and 2 highlight the baseline demographics of donors and recipients, with significant differences observed in some comparative markers.

We observed a significant increase in the number of voluntary renal donations almost doubling every year from 24 donations in 2013 to 48 in 2014, 98 donations in 2015, 128 donations in the year 2016, and 161 donations until November 2018.

Out of the 600 renal donations till November 2018, 97.4% (585) were living donors and 2.6% of donations were deceased donors.

Among the pre donation characteristics, the mean age of the donors was 44.0 ± 11 years at the time of renal donation. The mean body mass index observed in our study was 21.4 ± 0.06.

Family history of hypertension was present in 14% (n = 600) and family history of diabetes in 10% (n = 600), and none of the donors had renal disease in the family.

Majority (78%) of the donors were females, whereas males contributed to 21.8% of renal donations.

**Relation of donors to recipients**

We observed that mothers contributed to be the highest number of donors accounting for 181 donations (n = 600), followed by wives who contributed to 102 of renal donors (n = 600), and 98 (16.3%) fathers donated to their children. Fifteen percent of the donors donated kidney to their siblings (Table 3).

We found that there were more donations from women to male patients than from male donors to female patients (P <0.001), whereas donations from male donors to male patients were similar. Women were more likely to be the living donor in partner-to-partner kidney transplants (17%) than men (1.66%).

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**Table 1.** Total number of renal donors with gender characteristics (n=600).

| Renal donors | n (%) |
|--------------|-------|
| Living       | 585 (97.50) |
| Cadaver      | 15 (2.50)  |

**Table 2.** Mean age of the donors and recipients according to gender.

| Variable       | Donor | Recipient | P     |
|----------------|-------|-----------|-------|
| Mean age (years) | 44 years | 46 years | <0.001 |
| Female         | 469    | 204       |       |
| Male           | 131    | 396       |       |

**Table 3.** Relationship of renal donor with recipients (n = 600).

| Relationship                                         | n (%) |
|------------------------------------------------------|-------|
| Mother                                               | 182 (30.00) |
| Wife                                                  | 102 (17.00) |
| Husband                                              | 10 (1.66) |
| Father                                               | 98 (16.30) |
| Sibling (sister/brother)                             | 90 (15.00) |
| Mother-in-law                                        | 45 (7.50) |
| Father-in-law                                        | 5 (0.80) |
| Son/daughter                                         | 3 (0.50) |
| Others (swap/sister-in-law/brother-in-law/aunt/cousin)| 65 (10.80) |
Discussion

This single-center retrospective analysis of 600 donor kidney transplants is one of only a few studies to explore the relationship between gender disparities. Our study confirmed some well-known observations consistent with living donor kidney transplant (e.g. more female donors and less female recipients).

This is important since majority of them were mothers, wives, or sisters representing the emotional self-willingness to donate.

Gender disparity has been observed in living donor kidney transplant, and this appears to be unrelated to underlying medical issues in men or increased female representation in the general population. However, there are many confounding influences to who does and does not become an organ donor. Our analysis demonstrates significant gender disparities, especially in partner-to-partner and parent-to-child kidney transplant between South Asian donors and recipients. The explanation for this is speculative, but culture is likely to supersede any biologic factors, with the well-recognized gender-discriminatory health issues among South Asians.

In cases of partner-to-partner living donor kidney transplant among South Asians, in 90.9% of cases, donation was from women to men. This is higher than that shown in the study by Kayler et al., where females comprised 68% of donors in all spousal pairs, but consistent with previous literature conducted in South Asians that identified an 87.7% living donor rate in marriages from wife to husband.

Of note, not all studies have identified women as more likely to be the living kidney donor. Taheri et al., analyzing 672 living kidney donations from the Iranian National Registry, identified men as being the donors and recipients in 80.0% and 62.2% of cases, with recipients more likely to receive a living kidney donation from their own gender group. The authors speculated on multifactorial reasons to explain the predominance of men as the living kidney donor, which included social, cultural, and economic factors.

There are several limitations to this study.

We have no record of potential living kidney donors who came forward but were declined for medical reasons.

This would allow us to confirm whether gender disparity in certain ethnic relationships is not biased against men due to greater prevalence of underlying health issues. However, Avula et al. have previously found that men and women were ruled out as potential donors at similar rates on the basis of basic medical conditions or blood group incompatibility.

Conclusion

We found gender disparity in living donor kidney transplant in a single center that caters to a population of varied cultures and socio economic backgrounds. We anticipate that these results will guide clinicians and living donor coordinators and lead to appropriate counseling for patients and potential donors.

Conflict of interest: None declared.

References

1. Westlie L, Leivestad T, Holdaas H, Lien B, Meyer K, Fauchald P. Report from the Norwegian National Hospitals Living Donor Registry: One-year data, January 1, 2002. Transplant Proc 2003;35:777-8.
2. Foss A, Leivestad T, Brekke IB, et al. Unrelated living donors in 141 kidney transplantations: A one-center study. Transplantation 1998;66:49-52.
3. Kayler LK, Meier-Kriesche HU, Punch JD, et al. Gender imbalance in living donor renal transplantation. Transplantation 2002;73:248-52.
4. Bloembergen WE, Port FK, Mauger EA, Briggs JP, Leichtman AB. Gender discrepancies in living related renal transplant donors and recipients. J Am Soc Nephrol 1996;7:1139-44.
5. Avula S, Sharma RK, Singh AK, et al. Age and gender discrepancies in living related renal transplant donors and recipients. Transplant Proc 1998;30:3674.

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