

Family Relations of Living-Related Kidney Donors in Tripoli, Libya

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Abstract

Introduction: Despite efforts to increase community awareness of kidney donation and transplantation, there remains a huge gap between the number of kidneys needed and those available. **Objectives:** We aimed to document the types of relationship between donors and recipients of kidney transplants in a previously unexamined community. **Patients and Methods:** This was a descriptive retrospective study of 454 living-related kidney transplant patients registered during 2019 in the posttransplant clinic at the National Centre for Organ Transplantation, Tripoli, Libya. Demographic data and the type of relationship between recipients and donors were studied. **Results:** There was a male donor predominance (67.4%), with a male-to-female ratio of 2: 1. The mean age of the donors was 34.2 ± 10.27 years. The sibling constituted the majority (62.2%) of donors, with brother predominance. They were followed by off-spring donors (17.6%), with a predominance of sons and parents (12.4%), with mothers acting as donors more than fathers. Donation from spouses was relatively infrequent (3.5%). **Conclusions:** The study revealed that brothers are the most common donor and all donors more commonly donate to male recipients, except mothers who donate more commonly to female recipients. This may be reflective of the sociocultural factors. More social awareness is needed regarding organ donation, especially among females, to increase their contribution in donation.

Keywords: Cultural factors, end-stage renal disease, Libya, living kidney donor

INTRODUCTION

The public health importance of end-stage renal disease (ESRD) is derived from the high mortality rate and impaired quality of life among patients and the high cost of renal replacement therapy.^[1]

Kidney transplant is the replacement therapy of choice for patients with ESRD because kidney recipients have a better quality of life and more remarkable survival than dialysis patients.^[2-5] They

also consume fewer health-care resources.^[4] The number of patients with ESRD is rising rapidly, in the face; of a limited supply of acceptable quality organs for transplantable kidneys.^[6]

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Living donor kidney transplantation has been widely advocated to address the global shortage of organs. It can offer transplant recipients superior graft and survival outcomes compared with that of a deceased donor transplant.^[7-10] Although there are significant benefits for recipients, living kidney donation carries various risks to the donors. Hence, it is considered ethically justified only on the term that donors undergo rigorous medical screening and assessment. Donors must provide informed and voluntary consent after education about the potential risks and uncertainty regarding long-term outcomes and access to long-term health care.^[6,10] A third to half of all kidney transplants in high-income countries are from living donors, of whom the majority are parents, spouses, or siblings. Among low-income countries, living donation rates vary widely from 26% of Panama transplants to 100% in Vietnam, India, and Nepal.^[10,11] Recent evidence of small absolute increases in the risk of ESRD, hypertension, hypertension in pregnancy, and all-cause mortality among donors within three decades after donation, compared with the general or healthy population, reinforces the need for ongoing research and follow-up of living kidney donors.^[10]

In the absence of a cadaveric program, our main source is from living-related renal transplantation. Therefore, we intended to characterize the nature of family relationships between the recipients and donors in our population and compare these with previously published reports from regional and global series.

PATIENTS AND METHODS

This is an observational, retrospective chart review study. It was carried out at the National Center for Organ Transplantation, based in Tripoli Central Hospital, Tripoli, Libya. All recipient patients who had been registered in the postkidney transplant outpatient clinic between January 2010 and December 2019 were included in this study. Charts of these patients were reviewed, and data were retrieved to capture donors' age, sex, degree of consanguinity to the recipient (if any), and the recipient's age and sex. Some data were missing in the patient's files, and these were recorded as

an unknown variable. Data were de-identified and analyzed anonymously using IBM SPSS Statistic 25.

RESULTS

Four hundred and fifty-four kidney transplant cases registered in the posttransplant clinic during 2019 had been reviewed. Based on the available data, complete information regarding the sex of 368 kidney transplants from living donors (81%) was gathered. There were 248 (67.4%) men and 120 (32.6%) women among the living donors. The male-to-female ratio was (2: 1) [Figure 1].

Complete information on the age of living kidney donors was collected in 318 cases (70%). The youngest donor was 18 years old, and the oldest was 67 years old. The mean age of the donors was 34.2 years (± 10.27) [Figure 1]. Majority of the donors (90.3%) were aged <50 years. Only five donors (1.6%) were older than 60 years; one donor was older than 65 years. The age of donors ranged between 18 and 67 years in our study [Table 1].

The relation between the donor and the recipient would be defined in 370 cases of the 454 total transplants (81.5%); 92.1% were first-degree relatives, 4.3% were second-degree relatives, and 3.5% were emotionally related (partner relation).

The five main relationships between donors and recipients were sibling to sibling (62.2%, $n = 230$), with brother (71.3%; $n = 164$) more than sister (28.7%, $n = 66$). Child-to-parent donation (17.6%, $n = 65$) was more prevalent, in which son donated more than daughter (77%; $n = 50$ vs. 23%; $n = 15$). Parent-to-child donation (12.4%, $n = 46$) was more common, with the mother (63%; $n = 29$) donating more commonly than the father (37%; $n = 17$), and mothers were more likely to donate to the female recipient (55.2%) as opposed to all

Table 1: Frequency distribution of the donor age group

Age group	Frequency (%)
18-19	5 (1.6)
20-29	116 (36.5)
30-39	110 (34.6)
40-49	56 (17.6)
50-59	26 (8.2)
≥ 60	5 (1.6)

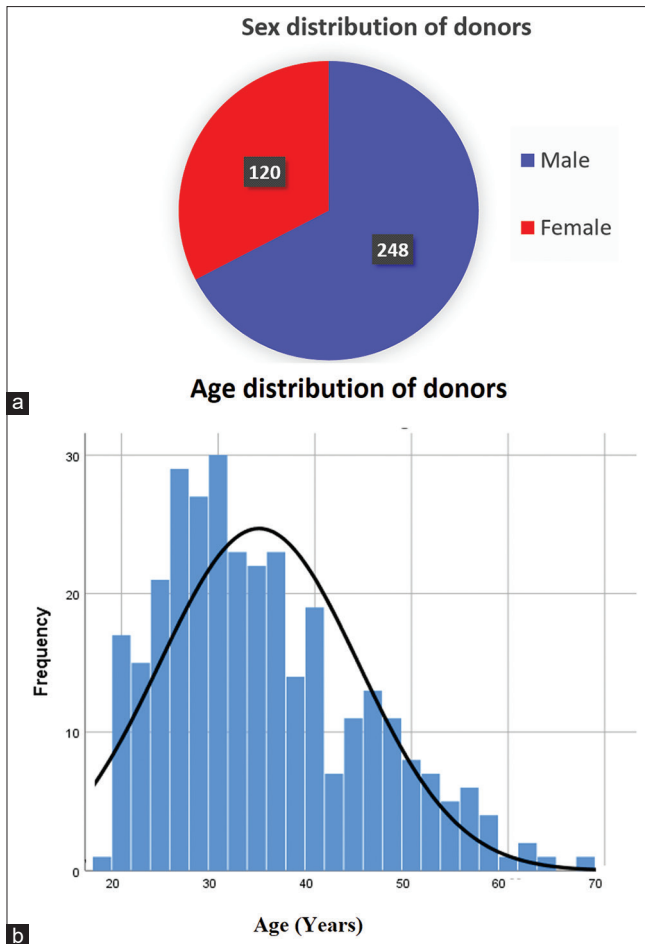


Figure 1: Sex distribution (a) and age distribution (b) of donors

other relatives whose donation was more concentrated on male recipients. Figure 2 depicts family relationship of donors by recipient sex (4.3%, $n = 16$) (as nephew, uncle, cousin, and aunt). Moreover, on analyzing spousal relation (3.5%, $n = 13$), wife was more likely to be the living donor (77%, $n = 10$). Overall, brother is the most common donor (44.3%), followed by sister (17.8%), son (13.5%), mother (7.8%), father (4.6%), daughter (4.1%), spouses (3.55%), and other relations (nephew, cousin, uncle, etc.) (4.3%) [Table 2].

There was a male donor predominance except for mothers who donate more often to female recipients [Figure 2].

DISCUSSION

In our study, more than two-thirds of the living donor was male. This is in principle concordant with a previous study from our own center in 2008.^[12] However, in the previous study, males

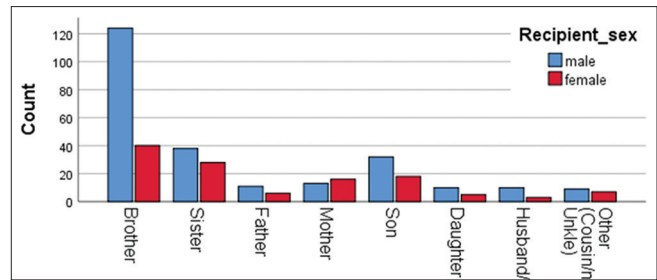


Figure 2: Family relationship of the donor by recipient sex

Table 2: The nature of various degrees of family relations in 370 kidney transplantations

Relationship	Frequency, n (%)	Percentage overall
Sibling to sibling	230 (62.2)	-
Brother	164 (71.3)	44.3
Sister	66 (28.7)	17.8
Parent to child	46 (12.4)	-
Father to child	17 (37)	4.3
Mother to child	29 (63)	7.8
Off-spring to parents	65 (17.6)	-
Son to parent	50 (77)	13.5
Daughter to parent	15 (23)	4.1
Spouse	13 (3.5)	3.5
Husband to wife	3 (23)	
Wife to husband	10 (77)	
Second-degree relative (cousin/nephew/uncle)	16 (4.3)	4.3

contributed more than three-quarters of kidney donors. This reflects an increased contribution of females to the donor pool in Tripoli over the last decade. However, both Libyan studies observed a less Male dominance in comparison to an Iranian study that revealed a predominance of Male donors at 82.5%.^[13] Nonetheless, the Iranian study included more living unrelated transplantation, where the economic factor may have been implicated.^[13] Our results are at variance with studies in England, Morocco, and Egypt, in which female donors were predominant, representing 54.7%, 60%, and 51.4%–56.3%, respectively.^[3,4,14,15] The lower rate of female donation in our study may be attributed to sociocultural factors. The conservative society tends to overprotect females, putting males more prone to face difficulties and hardships and meet social and family responsibilities.

Our study had shown an expansion of the donor age range by a decade in comparison with the mean age reported previously (viz., 67 years vs. 56 years).^[12]

However, our present results are more comparable with that of Morocco (age range: 18–66) years.^[14] In contrast, our donors were younger than that of other studies in Morocco, Tunisia, the USA, and Poland.^[6,8,14,16] This may be explained by the tendency of our team to ensure a perfectly healthy donor and exclude borderline donor. In our study, living donor transplantation was observed mainly in sibling relationships at (62.2%), the same was found in data from Egypt at 50%, Tunisia at 46%, Saudi Arabia at 81.7% and USA at 39.55%.^[8,15-17] The main reason attributed to this result is siblings are usually younger and healthier. As a donor, brother was the most typical (44.3%), followed by a sister (17.8%), which is in consonance with the studies conducted in Tunisia and Saudi Arabia,^[16,17] but contrary to that found in Morocco, where a sister donates (34%) more commonly than a brother (31%).^[14] These observations may be indicative of the complex social and family dynamics.

One in eight transplants in our study were a parent-to-child donation, with mothers donating more commonly than fathers. This is notably lower than the trend observed in England where parent-to-child donation represented 30.9% of all the donations, and also acted as donors and father more than mother.^[3] Furthermore, in Poland, the USA, and Tunisia, parent-to-child donations were more common (59%, 32.5%, and 42%, respectively), compared to donations in other relationships.^[6,8,16]

There was a low rate of donation between spouses, representing only 3.5% of the donations recorded in the study. Interestingly, wives were more likely to donate than their husbands (viz., ten cases vs. three cases). The trend is at variance with that observed in England, Poland, the USA, Tunisia, and Saudi Arabia, in which the corresponding rates were 27.8%, 12%, 4.1%, 9%, and 6.6%, respectively.^[3,6,8,16,17]

CONCLUSIONS

The study sheds light on the family relationships involved in kidney donation. The present study revealed that brothers are the most common donors and all donors donate more commonly

to male recipients, except mothers who donate more commonly to female recipients. This reflects the cultural factors that put males on higher responsibility. Future studies should include prospective documentation of the motives for donation in addition to the donor and recipient measures of socioeconomic status and family relations. More social awareness is needed regarding organ donation, especially among females, to increase their contribution in kidney donation.

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Authors' contributions

All authors conceived the study jointly. JSE performed database research and drafted the manuscript. Both authors reviewed the manuscript critically for contents and approved the content of the manuscript in its final version.

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Conflicts of interest

There are no conflicts of interest.

Compliance with ethical principles

Not applicable. The study was undertaken as a quality assurance exercise. All patients seen in our institution signed a general consent for use of their data for education and research anonymously. All original data were de-identified and were analyzed anonymously.

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