Reasons Why Organs From Deceased Donors Were Not Accepted for Transplantation

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ABSTRACT

Introduction. The rate of organ donations from deceased donors in Turkey is among the lowest in the world. We analyzed the reasons why some potential donors whose families had given consent did not become actual solid organ donors.

Methods. We retrospectively reviewed the organ donation, retrieval, and transplantation registries of 102 potential donors from the Ministry of Health Organ and Tissue Transplant Coordination Centre of Istanbul Region from the year 2015.

Results. Cardiac arrest occurred in 8 of the potential donors while waiting for organ procurement or during surgery. The organ specific suitability ratio was 83% for kidneys, 82% for livers, 72% for hearts, and 75% for lungs. Of these suitable organs, the transplantation rates were as follows: kidneys 88%, livers 70%, hearts 30%, and lungs 13%. Medical reasons (donor unsuitable) (14%–24%) and poor organ function (2%–24%) were the reasons most organs were not accepted for transplant. These reasons included diabetes insipidus, electrolyte imbalance caused by neuro-humoral changes, inotrope/vasopressor requirement for hemodynamic instability, hypoperfusion, and myocardial dysfunction after brain death.

Conclusion. The mismatch between organ donation and demand is a major problem worldwide. In addition to low organ donation rates, late diagnosis of potential donors or inappropriate management of the pathophysiological consequences of brain death reduce the number of transplantable organs even more in our country. In order to overcome these setbacks, we need education programs to improve quality and decrease donor losses in an intensive care unit goal-directed protocol for the management of potential donors.

THE CRITICAL shortage of cadaveric donor organs is a worldwide concern. The disparity between the number of cadaveric organs donated for transplant purposes and those patients awaiting transplantation continues to increase. To overcome this setback, the criteria to become a donor have been expanded and protocols for donor management have been formed. The critical pathway for deceased organ donation proposed by the World Health Organization in 2010 gives information about the description and assessment of the deceased donation process [1]. With this algorithm, the reasons why potential donors do not become utilized donors were also mentioned.

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Table 1. Reasons for Organs Not Being Accepted for Transplantation

	Kidneys		Liver		Heart		Lungs	
Donor Reasons	N	%	N	%	N	%	N	%
Donor unsuitable–medical reason	127	23	56	14	39	22	28	15
Poor function	126	23	73	19	4	2	31	17
Donor unsuitable–past history	71	13	17	4	8	4	5	3
Donor unsuitable–age	62	11	31	8	30	17	24	13
Infection	49	9	17	4	10	6		
Poor perfusion	11	2	6	2				
Tumor/biopsy results	3	1	2	1				
Organ unsuitable–clinical					15	8		
Obesity/fatty organ			8	2				
Organ not suitable for transplant	2	0						
Anatomical	1	0						
(+) Virology			15	4	5	3	1	1
CPR					10	6		
Alcohol addiction/smoker			8	2			4	2
Other	3	1						
Logistical Reasons	N	%	N	%	N	%	N	%
Recipients central/team not suitable	72	13	45	11	6	3	30	16
No suitable recipients	14	3	111	28	51	29	46	25
No beds/logistical/technical reasons			4	1			8	4
Recipient unsuitable–clinical							5	3
Recipient unfit			1				2	1
Total	541	100	394	100	178	100	184	100

Abbreviation: CPR, cardiopulmonary resuscitation.

The rate of organ donations from deceased donors in Turkey is lower than in other countries [2]. This limited number of deceased donors must be used effectively. The reasons why a potential donor does not become an actual one may vary according to the system, the donor, or the organ being proposed. We analyzed the reasons why some potential donors become actual donors in Turkey.

MATERIALS AND METHOD

We retrospectively reviewed the organ donation, retrieval, and transplantation registries of 102 potential donors from Ministry of Health Organ and Tissue Transplant Coordination Center of Istanbul Region from the year 2015. The data of which organs and tissues are donated, whether the intended transplantations were actually done, and why organs were discarded were evaluated. Kidneys, livers, hearts, and lungs were assessed separately regarding the reasons for and numbers of refusals.

Patients' characteristics and the reasons why transplant centers refused organs are described as absolute numbers, percentages, and means with standard deviation.

RESULTS

In this study, 102 donors (63 men and 39 women) were evaluated. The mean age was 50.19 ± 18.92 years. Cardiac arrest occurred in 8 of the potential donors while waiting for organ procurement or during surgery. For the 102 deceased potential donors, the organ-specific suitability ratio was 83% for kidneys, 82% for livers, 72% for hearts, and 75% for lungs. Of these suitable organs, the transplantation rates were as follows: kidneys, 88%; livers, 70%; hearts, 30%; and lungs, 13%. The reasons why the proposed organs were not accepted/found suitable for transplantation by the transplantation team are presented in Table 1. Medical reasons (donor unsuitable) (14%–24%) and poor organ function (2%–24%) were the primary reasons for not being accepted for transplant. Logistical problems were also among prominent reasons for not being accepted, including diabetes insipidus, electrolyte imbalance caused by neuro-humoral changes, inotrope/vasopressor requirement for hemodynamic instability, hypoperfusion, and myocardial dysfunction after brain death.

DISCUSSION

The mismatch between organ donation and demand is a major problem worldwide. In addition to low organ donation rates, late diagnosis of potential donors and inappropriate management of the pathophysiological consequences of brain death reduce the number of transplantable organs number even more in Turkey.

The organs are not used mainly because either the donor or organ is unsuitable, the family refuses consent, or no suitable recipient exists [1]. In this study, the reasons why organs that the family has given consent to use are not used are evaluated in 2 categories: first, systemic problems such as logistical problems or the lack of a suitable recipient; and second, donor-derived problems.

The most common solid organ transplanted, both in Turkey and around the world, is the kidney. Cadillo-Chávez et al investigated the reasons why proposed kidneys are not accepted and classified them into 2 categories: donor-specific (ie, donor quality, donor social history, donor age,

donor size/weight, and positive serologic tests) and kidney-specific (ie, preservation time, anatomic damage, elevated creatinine, abnormal urinalysis, abnormal biopsy, and decreased urinary output) [3]. According to this study, donor-related causes were the most prominent reasons for kidneys being refused. Confirming these results, we also found that medical reasons and unsuitable donors were the most frequent reasons for refusal. Furthermore, two of the most frequent reasons logistic reasons for kidney transplants not going forward were that the recipient or central team was not suitable, or no suitable recipient was found.

Like kidneys, the liver was the second most transplanted organ and was most frequently refused because of donor-related factors, ie, poor function and medical reasons; however, unlike kidneys, a lack of suitable recipients was not among the most common reasons for refusal. One reason for this may be that the high number of patients waiting to be a kidney transplant recipient forms a wide recipient pool, whereas there are far fewer patients waiting for a liver. The high number of kidney transplant centers compared with liver and heart-lung transplant centers also plays a role in this difference.

For heart transplantation, the most common reason for rejection is medical causes, as it is for other organs, but in this case the donor's age is a more important reason for refusal compared with other organs. Organ mismatch and the use of cardiopulmonary resuscitation also contribute to the reasons for refusal. As for the liver, the most common reason is the lack of suitable recipients, which is also the most frequent cause of lungs being refused. Poor function, recipient team/center not suitable, medical reasons (donor unsuitable), and donor age are the next most common reasons, respectively. Intravenous fluid management and mechanical ventilation strategies to maintain hemodynamic stabilization during donor management may have detrimental effects on lungs, rendering them unsuitable for transplantation [4].

Donor-associated and logistic reasons comprised the majority of reasons why proposed organs were refused by the centers they were offered to (Table 1). Turkey has no written guideline regarding donor management or the assessment and acceptance of potential brain-dead organ donors; for this reason, there are also differences in management that affect organ dysfunction and quality. There are also discrepancies between centers regarding why organs are accepted.

Cadillo-Chávez et al studied the outcomes of kidneys that were refused by the first center they were offered to but accepted by other teams and identified areas in which they could maximize the utilization of donor organs [3]. The disparity between the supply of and demand for organs and donors is still a big problem, although several steps have been taken. Cadaveric organ donations and utilization of the organs must be maximized by educational programs and potential goal-directed donor management protocols. Efforts must be made to maximize organ quality and decrease donor losses.

In conclusion, the intensive care management of potential organ donors is important in reducing the mismatch between organ supply and demand. To overcome this mismatch, protocols in optimizing organ function and improving donation yield must be promoted [5].

REFERENCES

[1] Domínguez-Gil B, Delmonico FL, Shaheen FA, et al. The critical pathway for deceased donation: reportable uniformity in the approach to deceased donation. Transpl Int 2011;24:373–8. https://doi.org/10.1111/j.1432-2277.2011.01243.x.

[2] International Registry in Organ Donation and Transplantation Database. IRODaT website, http://www.irodat.org; n.d. [accessed 05.12.2018].

[3] Cadillo-Chávez R, Santiago-Delpín EA, González-Caraballo Z, et al. The fate of organs refused locally and transplanted elsewhere. Transplant Proc 2006;38:892–4.

[4] Westphal GA, Garcia VD, Souza RL, et al. Guidelines for the assessment and acceptance of potential brain-dead organ donors. Rev Bras Ter Intensiva 2016;28:220–55.

[5] Maciel CB, Hwang DY, Greer DM. Organ donation protocols. Handb Clin Neurol 2017;140:409–39.