



# Challenges of Organ Donation: Potential Donors for Transplantation in an Area of Brazil's Northeast

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## ABSTRACT

**Background.** New strategies to manage the pool of potential donors are needed to increase organ donation rates. The purpose of the study was to identify the main causes of lack of organ donation and to identify the sociodemographic and clinical profiles of potential organ donors in an area of northeastern Brazil.

**Methods.** We conducted a cross-sectional, retrospective, observational study between November 2015 and January 2017.

**Results.** A total of 150 potential donors were included in the sample. The main cause of death among potential donors was hemorrhagic stroke (35.3%). Hypertension was the most prevalent comorbidity (25.6%). Family member's refusal was cited as the most common reason for not performing organ donation (49.4%). Among the causes of family member's refusal, the most prevalent was declaration of non-consent in life (23%), followed by family disagreement (20.3%).

**Conclusion.** There is clearly a need for public educational efforts with regard to organ donation. Educational advertising campaigns can help improve the authorization rate of organ donation.

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**T**HE CURRENT practice of organ transplantation and its application in disease treatment has been among the greatest advances in the history of medicine. In Brazil, transplantation emerged in the 1960s and has increased significantly in frequency in recent years. Organ transplantation is the best therapy for terminal and irreversible organ failure. It is also improve the patient's quality of life [1].

Brazil has one of the largest public organ and tissue transplant programs in the world, and has the second largest kidney and liver transplantation program in the world. The Brazilian Public Health System supports the majority of transplants, but it depends on sufficient donation of organs [2–4].

Many initiatives and campaigns have been put into place to increase organ donation in Brazil, but donation remains insufficient [5–7]. It is of paramount importance to identify the barriers in this process.

This study is relevant to public health in Brazil, which faces an increasing rate of chronic terminal diseases. New strategies to manage the pool of potential donors are

needed to increase organ donation rates. The knowledge of the main causes of non-organ donation could identify failures in the process, and from these data, guide the development of future strategies to increase the numbers of organ transplantations. The aim of the study was to identify the main causes of lack of organ donation and to characterize the sociodemographic and clinical profile of potential donors from the area near Cariri, in Ceará, Brazil.

## METHODS

We conducted a cross-sectional, retrospective, observational study between November 2015 and January 2017. The study was

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performed within the Organ Procurement Organization (OPO) of the region of Cariri, located in the southern portion the State of Ceará. There are 2 other OPOs in Ceará. Our sample consisted of 150 medical records. Data on sociodemographics and cause of brain death were collected. The local research ethics committee of the participating institutions approved the study. All subjects provided informed consent.

**RESULTS**

We identified 326 brain death (BD) protocols, of which 150 (41.7%) remained as potential donors. Table 1 presents the sociodemographic profile of the potential organ donors. There was predominance of males (n = 91, 60.7%), age >62 years (n = 53, 35.4%), nonwhite (n = 77, 51.4%), and married (n = 25, 16.9%).

Table 2 presents the clinical features of potential organ donors. Hemorrhagic stroke (HS) was the main cause of BD (n = 53; 35.3%), followed by the traumatic brain injury (TBI) (n = 38, 25.3%) and ischemic stroke (IS) (n = 36, 24%). Regarding the past history, systemic arterial hypertension (SAH) was the most prevalent comorbidity (25.6%).

Table 3 presents the reasons for refusal of organ donations. Family members' refusal was the main cause (49.4%, n = 74), followed by cardiorespiratory arrest and medical contraindications. Due to the high rate of refusals, we sought to identify the reasons for family refusal. Patient declaration of non-consent in life (23%) followed by family disagreement (20.3%) were the main reasons for family refusal.

**DISCUSSION**

The potential donor profiles in the present study resemble those observed in other studies conducted in Brazil. The predominance of male gender corroborates with research

**Table 2. Clinical Features of Potential Organ Donors**

Characteristics	n	%
<b>Cause of death</b>		
HS	53	35.3%
IS	36	24%
TBI	38	25.3%
Tumor	4	2.7%
HIE	5	3.3%
Other	14	9.4%
<b>Blood type</b>		
A <sup>+</sup>	40	26.6%
A <sup>-</sup>	3	2%
B <sup>+</sup>	11	7.3%
B <sup>-</sup>	1	0.7%
AB <sup>+</sup>	7	4.7%
AB <sup>-</sup>	1	0.7%
O <sup>+</sup>	63	42%
O <sup>-</sup>	3	2%
Not known	21	14%
<b>Personal background</b>		
DM	10	12.2%
SAH	21	25.6%
Smoking	18	22%
Alcoholism	20	15.8%

Abbreviations: IS, ischemic stroke; SAH, systemic arterial hypertension; HS, hemorrhagic stroke; DM, diabetes mellitus; HIE, hypoxic-ischemic encephalopathy; TBI, traumatic brain injury.

carried out in the same area of Ceará and other cities in Brazil [6–8]. Moreover, the Brazilian Registry of Transplants also describes males as the primary donor source [3]. There is, however, a higher incidence of mortality in males [8]. In Spain, India, and Puerto Rico, there is also a predominance of potential donors in the male population [9–11]. One study from France evaluated data between 2012 and 2013 and identified a male:female ratio of 1.4:1 for potential donors, which was supported by our findings [12].

Regarding the age group of the potential donors, data we obtained are in contrast to a previous study performed in

**Table 1. Sociodemographic Profile of Potential Organ Donors**

Characteristics	n	%
<b>Gender</b>		
Male	91	60.7%
Female	59	39.3%
<b>Age (years)</b>		
0–14	2	1.3%
15–30	28	18.7%
31–46	35	23.3%
47–62	32	21.3%
>62	53	35.4%
<b>Ethnicity</b>		
White	29	19.3%
Black	14	9.3%
Brown	77	51.4%
Not known	30	20%
<b>Marital state</b>		
Single	15	10%
Married	24	16%
Widowed	4	2.7%
Divorced	1	0.6%
Stable union	3	2%
Not known	103	68.7%

**Table 3. Reasons of Declining Organ Donation and Family Refusal**

Characteristics	n	%
<b>Reason for not establishing</b>		
Family refusal	74	49.4%
Unstable hemodynamics	2	1.3%
Cardiac arrest	36	24%
Contraindication	20	13.3%
Nonconclusive diagnosis	12	8%
Not informed	2	1.3%
Others	4	2.7%
<b>Familiar refusal reasons</b>		
Nondonor in life	17	23%
Familiar disagreement	15	20.3%
Nonfavorable familiars	11	14.9%
Not informed	7	9.4%
Service dissatisfaction	6	8.1%
Long time in process	5	6.7%
Body integrity	4	5.4%
Others	9	12.2%

Ceará, which indicated the most prevalent age group was 15 to 28 years [3]. In a study held in Santa Catarina the mean age was 42.8 years [13]. In São Paulo, the most common age range of potential donors was 41 to 60 years [14]. Another study carried out between 2012 and 2013 in France, the average age was 50 years [12]. Our data may be the result of the aging of the Brazilian population, which has undergone an increase in life expectancy in recent years, and also the modification of selection criteria for donors, which were previously more restrictive with regard to age [7,8].

Potential donor age expansion is also justified by the relationship with medical history. In the age group portrayed, there is greater vulnerability to the development of chronic diseases in older people. Indeed, comorbid health conditions disproportionately affect older patients. In a study of the nutritional profile of the elderly there was a high prevalence of SAH and diabetes mellitus (DM) [15].

Organ application with expanded criteria bring with them a dilemma, and the use of these organs can increase the chances of failure at transplantation, and also present a higher risk for the recipient and possible poorer long-term graft function [16]. Although use of the expanded criteria is legal by applicable national laws, due to scarce number of organ forward the wait queues for transplantation, thus to increase the number of donation engage use of donors considering frontier or also titled donors with expanded criterion [16,17].

The ethnicity of potential donors in this study reflects Ceará's state government registry. In Ceará, there is a predominance of nonwhites [3]. In other cities in north-eastern Brazil, nonwhite ethnicity is also the most prevalent [18]. It is also noteworthy that, in Brazil, the nonwhite population has less access to health and education, which increases the chances of disease.

Regarding cause of death of the potential donors, our data are similar to those of previous studies. TBI has decreased as the main cause of brain death and has been replaced by diseases of the circulatory system, including stroke [5,6,13,18]. This result suggests a modification in the profile of potential donors. In recent years there have been changes in the epidemiologic patterns and demographics in the country, as well as changes in causes of death in the Brazilian population. A potential bias of our sample is the location of data collection. The hospital is a reference in the region for trauma and stroke, which could explain the data obtained.

Family member refusal was pointed out as the most common reason for not carrying out organ donation. Previous works have shown similar findings. In one study performed in southern Brazil, the family refusal rate was even higher [13]. Other studies carried out in Brazil demonstrated family refusal as of the main limiting factors in the low availability of organs and tissues for purposes of transplantation [7,18,19]. One study that evaluated the causes of failure of organ donation at a university hospital in Brazil noted a very low organ donation rate of only 19.5%. Family refusal was cited as the main reason, occurring in 37.2% [20].

The high rate of family refusal for organ donation has also been reported in other countries. Family refusal was 87% in a study from India [11]. In Hong Kong, in a recent large study involving 1740 patients, the family authorization rate for organ donation was only 36.8% [21]. In a French study, 34% of the causes of non-donation were due to family refusal [12]. The UK has a refusal rate for organ donation considered to be among the highest in Europe, with 42% refusals before organ donation request [22].

The reasons for family refusal are related to different factors, among them cultural and religious issues, misinformation, inappropriate approaches on the part of professionals, and the lack of knowledge of the patient's wishes [6,7,19].

In analyzing the reasons for refusal of organ donation, we noticed a strong desire for non-donation among potential donors during their life. The expressed wish in life is one of the main factors for deciding on organ donation [6]. In France, family refusal rates were similar to what we observed. Regarding reason for refusal, 39% of family members indicated written refusal or that this issue had been spoken about in life. Twenty-eight percent of refusals were to keep the integrity of the body and 11% were related to religious belief [12].

Family disagreement regarding the donation decision is commonly related to the lack of consensus presented by family members with respect to organ and tissue donation [19]. In a study from India, disagreement between relatives was found to generate a consensus of refusal to donate organs [11].

Family members face a major dilemma: donate, and help other people, or protect the body of the deceased. Generally, the family will respect the patient's wish [23]. In Guanajuato, Mexico, 642 individuals >15 years old were surveyed, with >80% showing strong tendency to donate their own organ, but this figure decreased significantly when it pertained to donation of organs of a family member. Thus, although most people wish to donate, this is not reflected in the country's rate of donation. Personal beliefs, fear, and not knowing the potential organ recipient were among the other reasons listed for family refusal to donate in the Mexican study. However, 94.5% of the population indicated a wish to receive an organ if necessary [24].

It is important to realize the gap that exists between the number of people favorable to donation and those who truly authorize the procedure [18]. Meetings, advertising campaigns, lectures, and media can be used to promote issues related to the donation and transplantation of organs. Also, there is a need for training of professionals and an improved approach to family members. Both education of the public about maintaining a positive attitude toward organ donation and education of health professionals are key factors for increasing the rate of organ donation.

In conclusion, family refusal was found to be the greatest barrier to organ donation. Our study suggests subsidizing creation of new strategies for the national policy for organ

donation with the aim of increasing the number of donations/transplants.

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