CHARACTERIZATION OF THE POTENTIAL DONORS OF ORGANS AND TISSUES FOR TRANSPLANTATION

ABSTRACT

Objective: to characterize the Potential Donors (PDs) of organs and tissues for transplantation. Methods: it is an exploratory and descriptive study with prospective data and quantitative approach, performed in hospitals accredited by the Brazilian National Transplantation System - Sistema Nacional de Transplantes (SNT) in the city of Natal/RN, Brazil. The population consisted of 60 PDs, after approval of Ethics Research Committee of Hospital Universitário Onofre Lopes, from Universidade Federal do Rio Grande do Norte (UFRN), under CAAE under nº 0007.0.294.000-10. Results: there was predominance of female gender, average age of 41 years old, incomplete Elementary School, exercising a professional activity, family income from 1 to 3 minimum wages, catholic and single. The PDs were admitted to the ICU with diagnosis of stroke. The most donated organs were the kidney and the liver. Conclusion: we have found that knowledge on the characteristics of the PDs will assist in the care and maintenance and ensure greater involvement between health professionals and families, which will contribute to improve the number of donations. Descriptors: Nursing; Organ Donation; Brain Death.

RESUMO

Objetivo: caracterizar os Potenciais Doadores (PDs) de órgãos e tecidos para transplantes. Método: estudo exploratório e descritivo com dados prospectivos e abordagem quantitativa, realizado em hospitais credenciados pelo Sistema Nacional de Transplantes (SNT) em Natal/RN. A população constou de 60 PDs após aprovação do Comitê de Ética em Pesquisa do Hospital Universitário Onofre Lopes da Universidade Federal do Rio Grande do Norte (UFRN), sob CAAE nº 0007.0.294.000-10. Resultados: predominou o sexo feminino, média de idade de 41 anos, Ensino Fundamental incompleto, exercendo uma atividade profissional, renda familiar de 1 a 3 salários mínimos, católicos e solteiros. Os PDs estavam internados em UTI com diagnóstico de acidente vascular encefálico. Os órgãos mais doados foram o rim e o fígado. Conclusão: constatou-se que o conhecimento das características dos PDs ajudará nos cuidados de manutenção e garantirá maior envolvimento entre os profissionais e familiares, o que contribuirá para melhorar o número de doações. Descriptores: Enfermagem; Doação de Órgãos; Morte Encefálica.
INTRODUCTION

Transplants are highly complex procedures that require specialized human and material resources, high level technical training and continuing education, since they are related to the transfer of an organ or tissue from one person to another one.1,2 Its effectiveness depends, mainly, on the donation-transplantation process, which is a set of actions and systematized and interrelated procedures that can turn a Potential Donor (PD) in a donor with transplanted organs.1

Therefore, there are equal importance in each one of its actions and procedures, which are: identification, notification, assessment and maintenance of the PD, diagnosis confirmation of Brain Death (BD), family interview, documentation of BD, logistic aspects, removal and distribution of organ and tissues, transplantation and follow-up of results.1-3

PD of organ and tissues for transplantations is understood as every individual who is in unperceptive and unreactive coma and who has no illness that could prevent the donation.1,3

Your assessment should be initiated based on four prerequisites to be checked. Initially, it is necessary to have clinical evidence or neuroimaging that proves the acute injury of the encephalon, consistent with the suspicion of BD. The second topic to considered is the exclusion of hydroelectrolytic, acid-base, or endocrine disorders.4 The exclusion of exogenous intoxication is another important issue that must be ascertained through dosage of certain substances in the blood or observation of the patient by a period corresponding to four times the half-life of the elimination of the medicinal drug.4 The last topic to be evaluated is the exclusion of hypothermia, since the temperature is below 35 °C, may be responsible for the abolition of reflexes and decreased level of awareness.4

After analyzing these requirements, it should be achieved the neurological exam, which aims to demonstrate the absence of cortical brain activity, as well as the absence of activity in the brain stem, through the following findings: unperceptive coma, absence of reflexes, and apnea before hypercarbia.4,5

In the evaluation of the PD, the intensivist must take away causes that could prevent the donation, such as: hepatitis, neoplasy, drug use, Acquired Immunodeficiency Syndrome (AIDS) or belonging to a risk group. Should be requested, too, the basic laboratory tests of the protocol after the first clinical trial; and the serology should be sought after the consent for donation has been signed. The appropriate clinical and laboratory assessment is essential for obtaining a graft with quality, by avoiding the transmission of infectious or neoplastic diseases.3

It should be emphasized that every patient under suspicion of BD should accurately be evaluated and following an invariable routine. It is also important to have the knowledge on the characteristics of the PD, as these allow adding a social value to the donated organ / tissue, generating greater involvement and commitment of the professionals who are participating in the donation-transplantation process, donor family members and the receivers themselves of organs / tissues, besides to provide important data for future researches.

In this context, and by the insertion of the authors in a teaching hospital as teachers and as assistant nurses in ICU, the interest on this topic has arisen. The aforementioned ICU is located in a referential hospital in urgency and emergency and the major part of the attended patients are victims of cerebrovascular problems or external causes, which, by their gravity, frequently evolve to BD, becoming PDs. Nevertheless, the failure to recognize or delayed recognition of BD lead, sometimes, to the loss of organs due to an unexpected cardiac arrest, hemodynamic instability or infection, preventing the donation of organs and tissues in the researched sectors.

Thus, considering the presented facts, it is proposed that, through this investigation, seek response for the following research question: how are characterized the PDs of organs and tissues for transplantation of the State of Rio Grande do Norte regarding the sociodemographic and epidemiological aspects and the effectiveness of the donation?

This current study aims to characterize the PDs of organs and tissues for transplantation of the State of Rio Grande do Norte regarding the sociodemographic and epidemiological aspects and the effectiveness of the donation.

We believe that this study provides benefits to the health services, since this could guide conducts to be adopted from knowledge of the characteristics of the PDs, and it is also much valuable for those who need of transplantations therapeutic, because with the improvement in attendance, the number and the quality of offered grafts is enhanced.
METHOD

This is an exploratory study, with prospective data and quantitative approach, performed in hospital units accredited by the Brazilian National Transplantation System - Sistema Nacional de Transplantes (SNT) for removal and transplantation of organs and tissues, as well as the Center of Notification, Procurement and Organ Donation for Transplantation - Central de Notificação, Captação e Doação de Órgãos para Transplante (CNCDTO) and Organ Procurement Organization - Organização de Procura de Órgãos (OPO) of the State of Rio Grande do Norte, Brazil.

The population consisted of 60 PDs, that is to say, patients with diagnostic suspicion of BD, hospitalized in units accredited by the SNT. Data collection was held during the period August 2010 to February 2011.

The inclusion criteria were: all patients who present score 3 on the Glasgow Coma Scale in the study period; have defined cause of coma; the family member or responsible caregiver consenting in participating, with authorized signature of the Free and Informed Consent Form (FICF).

For data collection, we used a mixed instrument, obtaining information through the technique of non-participant systematic observation of databases from CNCDO and OPO, institutional documents such as occurrence books and medical records, beyond the interview with the family members. The project was previously appreciated and approved by the Ethics Research Committee of the Hospital Universitário Onofre Lopes (HUOL), under the Protocol n° 414/2010 and by the Certificate of Presentation to Ethical Appreciation - Certificado de Apresentação para Apreciação Ética - CAAE, under n° 0007.0.294.000-10.

Then, the data were tabulated and analyzed by using descriptive statistics and presented in tables. For this purpose, we used the SPSS 15.0 software and the Microsoft Excel®.

RESULTS AND DISCUSSION

When characterizing the sociodemographic profile of the 60 PDs of organs and tissues for transplantation, we found a small predominance of the female gender (53.8%).

Table 1. Sociodemographic characterization of the PDs of organs and tissues for transplantation according to the gender. Natal / RN, Brazil, 2012.

<table>
<thead>
<tr>
<th>Sociodemographic characteristics</th>
<th>Gender</th>
<th>Total</th>
<th>n</th>
<th>%</th>
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<td>Female</td>
<td>Female</td>
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<tr>
<td>Age Group</td>
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<td>4</td>
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<td>18-25 years</td>
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<td>3</td>
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<td>26-45 years</td>
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<td>13,3</td>
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<td>46-60 years</td>
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<td>25,5</td>
<td>7</td>
<td>11,7</td>
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</table>

*Source: research data

Although most researches show a higher incidence of PDs of the male gender, the data found in a study on the profile of PDs in the state of São Paulo, where 51.9% were female, have corroborated the results of this research. 6 8

Regarding age, the highest frequency observed stood in the age group from 46 to 60 years (36.7%), with an average of 41 years old. Nonetheless, there is a higher percentage of men in a younger age group, corroborating the Brazilian statistics, when shows that the registration of deaths among young males is
four times greater than that observed among young women.\(^9\)

According to the race, most were brown (61.7%). We found a similarity when comparing the results obtained in this study with the census data from Brazil, since this document indicates the predominance of the brown race in the Northeast Region of Brazil, with 62.7% of the population, and this index reaches 59.2% in the State of Rio Grande do Norte, location where this research was conducted.\(^9\)

With regard to the schooling level, incomplete Elementary School represented a higher percentage (41.5%), followed by incomplete High School (25.0%). These findings are similar to several studies conducted in Rio Grande do Norte, where the low schooling was predominant, and, also, to the census statistics, which shows that the average of years of schooling of the age group that includes people 25 years or older reveals the status of education in a society. Nationally, the average, in 2009, was 7.1 years of study in this population, which represents schooling below the completion of the Elementary School.\(^9\)\(^-\)\(^10\)

With respect to the occupation of respondents, we found that 61.7% had an occupation. Most women was inserted in activities related to the administration of the home (25.0%) and provision of domestic services (21.9%); and the men, in activities related to the civil construction (17.9%), transportation (14.3%) and students (14.3%). Results supported by the Brazilian Institute of Geography and Statistics - Instituto Brasileiro de Geografia e Estatística, when stating that, in organization and in the labor sexual division, the construction of gender relations still relies on socially determined roles for men and women. Despite the increase in the activity rate of women, they still remain as the main responsible for housework and child care and other family members.\(^9\)

With regard to the family income of the PD, this stood in the range from 1 to 3 minimum wages (73.4%). The income gained by the family is, basically, what defines its chances of acquiring goods and services. Accordingly, the per capita income is a very effective indicator to characterize the socioeconomic profile of the Brazilian families. In 2009, according to statistics, 29% of the Northeast families lived with an income up to the minimum wage. Therefore, these indexes reinforce the findings of this current research.\(^9\)

Regarding the religion, the Catholic has excelled (81.6%). This fact is reinforced by Brazilian statistics, which show that 73.6% of people who have a creed claim to be Catholic. It is important to emphasize that the Catholic Church sees the organ donation as a virtue. We understand that religions, when they talk about organ donation, see this act as a result of a process of detachment from the matter. It means, when the human being acquires awareness of the transience of its material and body life, it opens up itself for the possibility of a spiritual life.\(^9\)\(^,\)\(^11\)

In the case of marital status, singles had a higher frequency among the PDs of both genders (46.7%), indicating a similarity to a study conducted in São Paulo on the profile of effective donors of multiple organs and tissues, where 48.1 % of the sample was comprised by the above mentioned marital status.\(^6\)

Regarding the origin, the highest frequency (53.3%) was from the metropolitan region of Natal. This shows that, as a referential hospital in urgency and emergency, treats patients from all over the state and surrounding regions, however, the majority of the hospitalizations is among the 10 municipalities that comprise this region.

As for the epidemiological characteristics, it is observed that most PDs was hospitalized in a public hospital (86.6), in an ICU bed (68.3%), and this is because about 80% of the Brazilian population depends on public health services and the highest number of ICU beds is in the public hospitals. Furthermore, ICU is the place which is concentrated the most patients with severe general clinical picture. The intensive care with the PDs is essential, since it contributes to the improvement of the quality of the organ for transplantation. However, there is a significant percentage of PDs in the emergency sector (31.7%), confirming the crisis caused by lack of ICU beds in the Brazilian hospitals, where patients in critical condition remain in emergency sectors.\(^6\)
The predominant cause of BD was the Hemorrhagic Stroke (45.0%), followed by Traumatic Brain Injury (TBI) caused by traffic accidents (31.7%). By performing a comparison of causes of BD with the gender of the PDs, it is observed that the Hemorrhagic Stroke targets mostly women (35.0%); In contrast to the TBI caused by traffic accidents, which affects mostly men (26.7%). Comparing the causes of BD with age, it is observed that the PDs who died of Hemorrhagic Stroke had an average age of 50 years old, and who died of TBI caused by traffic accidents, 32.8 years old.

On these findings, it is important to emphasize that in recent years there have been several changes in demographic and epidemiologic patterns of our country (Brazil), modifying the causes of death of the population. Currently, circulatory system diseases are the main group of causes of death in Brazil, followed, in the case of men, by external causes (accidents and violence) and neoplasms. Among women, the second group of causes of death was neoplasms, then followed by respiratory system diseases.

Regarding the type of additional examination used for the diagnosis of BD, of the 48 (80%) potential donors (PDs) who underwent this procedure, the Transcranial Doppler was the most used (50.0%), followed by Electroencephalogram (26.7%) and Cerebral angiography (3.3%).

Contradicting the results of our research, the literature shows that the Electroencephalogram was the first method used to confirm the diagnosis of BD and even today is the most widely used, both in our country and in the world. However, the Transcranial Doppler is being increasingly used in diagnosis, showing sensitivity from 94 to 99% and specificity of 100%; while Cerebral angiography is considered the "gold standard" among the additional examination and demonstrate complete absence of cerebral perfusion.12

Regarding the protocol for the diagnosis of BD, of the 60 PDs identified, 14 (23.3%) did not get to finish the two neurological tests and the additional examination, which are needed to confirm this diagnosis. Of the 46 PDs who had completed the protocol of BD, in half of them (38.3%) the length between the two assessments and the additional examination got over 7 hours, and the other half with less than 7 hours. Nevertheless, in some PDs the length exceeded 12 hours (23%). These data are similar to results of a study conducted in the state of Sergipe about the potential for obtaining organs in an urgency hospital, where it was observed that only 10.0% of PDs had an interval of 6 hours between the first and the second examination; in half of them, the interval was greater than 12 hours, and, in 25%, the elapsed time was over 20 hours.13-14

With regard to the blood type of the PDs, the O + (38.3%) was dominant. Although some PDs (10%) have not performed this test, there is a similar distribution of this variable in comparison with other one that was found in the Brazilian Registry of Transplantations - Registro Brasileiro de Transplantes (RBT), which shows that, of 24 Brazilian states that perform transplantations, in 17 of them the blood O is predominant.15

According to the consummation of the donation, it should be verified that the largest percentage was of non-donors (70.0%). A survey performed in the Brazilian state of Sergipe about the potential for organ procurement at an urgency hospital found...
that only 7.0% of notified PDs become donors with transplanted organs, a percentage well below that which was found in our study. Other research on the effectiveness of the OPO in a countryside region of São Paulo obtained data that are more similar to ours, where 37.0% of assessed PDs become donors with transplanted organs. The data obtained in our study are also supported by the RBT, which shows an evolution of the organ donations in the Rio Grande do Norte from 2010, with indexes from 9.4 per million population (pmp) in this aforementioned year, to 16.4 donors per million population in 2011, and this fact is due to the creation of the OPO and trainings conducted with professionals involved in the donation-transplantation process in this state.6,7

As for the cause of non-consumption of the donation, the most frequent was the family refuse (38.1%), followed by cardiac arrest (28.6%). Results supported by the RBT, when they state that, in Brazil, the family refuse is the leading cause of non-consumption of the donation, pointing out to the need for public education campaigns, in order to clarify the donation process and stimulate its acceptance. Regarding the cardiac arrest, it should be explained by the fear of the prolonged time for confirmation the BD, which ends up causing hemodynamic instability in the PD and, finally, lead it to the cardiac arrest.16

According to the type of donated organ, it was found that there was a greater number of procurements of the kidney (94.4%), followed by the liver (44.4%). There was only one donor (5.5%) in which the heart was captured. This fact is related to the types of procurements and transplantations that are performed in the Rio Grande do Norte, since, in this state, today, heart and kidneys are captured and transplanted, and the liver is just captured. All livers that are removed are sent to other states, because there is still none transplantation center of this organ in our state. Another reason for explaining why there is more kidney procurements is related to certain advantages that this organ has to its use, such as: no age limit, if the laboratory value of creatinine is normal, has a time cold ischemia of 36 hours and can be extracted up to 30 minutes after the cardiac arrest. The liver is also an organ with high index of utilization, since it can be preserved between 12 and 24 hours after the withdrawal and grafted on up to two receivers.7

With respect to the cornea, of the 18 donors with transplanted organs, in 16 (88.8%) of them the corneas were captured. This tissue tends to be one of the most utilized, because there is no upper age limit for capture, and there is the possibility of removing it up to 12 hours at a temperature of 21 °, or, even, 24 hours if it is stored at a temperature of 4°.1

About the knowledge of the family members on the intention of being or not donor of organs and tissues, in most of cases (83.3%) family members were unaware of the will of the PD, and few of the donors (16.7%) expressed their desire in life. Of these, 8.3% said they wanted that their organs / tissues were donated and 8.3% said they did not intend to make a donation. A survey conducted in the city of Curitiba/PR, Brazil, on the main variables involved in the non-donation of cornea of PDs showed that, in a sample of 130 PDs, only nine left expressed somehow in life - they wanted to be donors.17

To change this situation, some campaigns have been carried out with the intention that every Brazilian who wants their organs to be donated for transplantation, in case of BD, capture, and there is the possibility of

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To change this situation, some campaigns have been carried out with the intention that every Brazilian who wants their organs to be donated for transplantation, in case of BD, tells the family about this desire. Certainly, at the time of the pain of loss, the family members will fulfill the last wish and authorize the donation. Clarify the will of donating is more important than one thinks; according to a study published in 2007 by University of Freire ILS, Vasconcelos QLDAQ de, Oliveira e Araújo R et al. Characterization of the potential donors...
Cleveland (USA), pointing out that, when the family knew the desire of PD in life, the chances of the donation be authorized were 6.9 times higher compared to those who were unaware of such endorsement. A study performed by the Universidade de São Paulo (USP) with teenagers, in 2006, revealed that 60% would not authorize the donation if they had not talked to the person about this issue.17 9

CONCLUSION

This current study has helped to understand sociodemographic and epidemiological characteristics and the effectiveness of the donation in Potential Donors (PDs) of organs and tissues for transplantation of the State of Rio Grande do Norte. Hence, we present the following conclusions.

As for the sociodemographic characteristics

We identified a sample of PDs with a slight predominance of the female gender, average age of 41 years old, of brown race, with incomplete Elementary School, the most exercising a professional activity, with family income from 1 to 3 minimum wages, predominance of Catholicism and single, with the origin of metropolitan region of Natal/RN, Brazil.

As for the epidemiological characteristics

The results showed that the PDs, mostly, were admitted to public hospitals in ICU bed diagnosed with Hemorrhagic Stroke. The protocol for the diagnosis of BD was completed in most PDs. The most used additional examination for completion of protocol of BD was the Transcranial Doppler and the completion time was less than 7 hours and greater than this time in others. The most common blood type was O, and no termination of the two neurological tests and exams needed to confirm the diagnosis of ME on a percentage of the population.

As for the characterization of the donations of organs and tissues for transplantation

It was observed that most PDs are non-donors, due to the family refuse. Of the 18 donors, in 16 the corneas were captured and the most donated organs were the kidney and the liver.

Follow the protocol for the definition of BD is essential to guarantee the quality of the actions and the safety of the entire donation-transplantation process. Nonetheless, the humanitarian relationships used in the process are extremely important and cannot be forgotten, hence, it is of great value that the healthcare team is aware of the characteristics of the PD, both those related to the physical and biological aspects, which will help in care of the maintenance of the PD, as those regarding social and emotional aspects, since they will ensure a greater involvement between health professionals and family members and will contribute to reduce the family refuse, and, thus, to improve the number of donations of organs and tissues.

REFERENCES

Characterization of the potential donors...


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