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RESEARCH

Structure, process and outcomes of organ and tissue donation for transplantation

Estrutura, processo e resultado da doação de órgãos e tecidos para transplante

Estructura, proceso y resultado de la donación de órganos para transplante

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ABSTRACT

Objective: to analyze the factors related to the structure, process and outcomes of organ and tissue donation for transplantation. **Method:** analytic, longitudinal and quantitative study, conducted in six hospitals in Natal/RN, between August 2010 and February 2011, with 65 potential donors (PD), by means of no participant observation structured script. **Results:** regarding the donation structure, there was deficiencies of physical resources (temperature control), materials (mobile radiology) human resources (nurse technicians) and lack of adequate records and care protocols. In the process of donation, the biggest problems were related to the evaluation stages, brain death diagnosis, maintenance and documentation, with greater proportion of care for the non-donor. **Conclusion:** the structure and process possibly determined the result of 72.3% no donation implementation of potential donors, indices compatible with the national data, but contradictory to those of Spain, which manages to transplant organs of 86.7% of its donors.
Key words: Nursing; Tissue and Organ Procurement; Brain Death.

RESUMO

Objetivo: analisar os fatores relacionados à estrutura, ao processo e resultados da doação de órgãos e tecidos para transplantes. **Método:** estudo analítico, longitudinal e quantitativo, realizado em seis hospitais de Natal (RN), entre agosto de 2010 a fevereiro de 2011, com 65 potenciais doadores (PD), mediante roteiro estruturado de observação não participante. **Resultados:** quanto à estrutura para a doação havia deficiências de recursos físicos (climatização), materiais (radiologia móvel), humanos (técnicos em enfermagem) e falta de registros adequados e protocolos assistenciais. No processo de doação, os problemas relacionaram-se às etapas de avaliação, diagnóstico de morte encefálica, manutenção e documentação, com maior proporção na assistência do não doador. **Conclusão:** possivelmente, a estrutura e o processo determinaram o resultado de que 72,3% dos potenciais doadores não efetivaram a doação, índices compatíveis com os nacionais, mas contraditórios com os da Espanha, que consegue transplantar os órgãos de 86,7% dos seus doadores.
Descritores: Enfermagem; Obtenção de Tecidos e Órgãos; Morte Encefálica.

RESUMEN

Objetivo: analizar los factores relacionados con la estructura, el proceso y los resultados de la donación de órganos y tejidos para trasplante. **Método:** estudio analitico, longitudinal y cuantitativo realizado em seis hospitales de Natal/RN entre agosto de 2010 y febrero de 2011, con 65 donantes potenciales (PD), a través guión estructurado de observación no participante. **Resultados:** Cuánto la estructura de la donación tuvo deficiencias de los recursos físicos (condiciones de visión PD), materiales (ropa de cama), humanos (enfermeras y médicos) y la falta de registros adecuados y protocolos de atención. En el proceso de donación, los mayores problemas relacionados con las etapas de evaluación, diagnóstico de muerte encefálica, el mantenimiento y la documentación, con la mayor proporción de la asistencia no donante. **Conclusión:** posiblemente, la estructura y el proceso

que determina el resultado en el 72,3% de los donantes potenciales no se han aplicado la donación, tasas compatibles con los nacionales, pero en contradicción con los de España, que se puede transplantar los órganos de 86,7% de sus donantes.
Palabras clave: Enfermería; Obtención de Tejidos y Órganos; Muerte Encefálica.

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INTRODUCTION

Since the 1950s, the transplant procedure has evolved from a high risk of death, performed only in patients with chronic renal failure in final stage, to an effective therapeutic intervention in terminal diseases of other organs such as heart, lung, liver, pancreas and intestine, besides tissues and cells. This notable progress come from a series of confluences, such as cultural acceptance, legal and political developments to facilitate donation and transplantation, recruitment and distribution of organs and tissues methods, advances in surgical and preservation techniques, immunology, immunosuppression and management of infections[1].

Donations and organs and tissues utilization, however, are still under the number of the needs of large waiting queues. In addition, it is emphasized that the effectiveness of the transplant is directly related to the deceased donor, because until the end of 2013, from the 7,649 solid organ transplants performed in Brazil, only 17.9% were performed on living donors[2].

Deceased donors are the individuals with confirmed diagnosis of Brain Death (BD), according to the resolution established by the Federal Council of Medicine (FCM). The donation of their organs and tissues depend on the consent of the spouse or relative of legal age, subject to the succession line, direct or collateral, to the second degree[3-4]. This donor may offer simultaneously for transplantation, heart, lungs, liver, pancreas, intestines and kidney as well as cornea, sclera, bone, cartilage, tendon, meniscus, fascia, heart valve and amniotic membrane[4].

Studies conducted in Brazil show that the main causes of non-effectiveness of the donation and transplantation of organs and tissues with the deceased donor are due to ignorance of the BD concept, both by population and by health professionals, inadequate structure of hospitals to perform the BD diagnosis and assistance to potential donor (PD), refusal of the family to authorize the donation, underreporting of PDs, logistical difficulties and medical contraindication[2,5].

In addition to this problem, the precarious structure of the Brazilian health system, characterized by overcrowded emergency rooms, with bedridden patients in corridors, long waiting time for care, tensions among health care team members, great pressure for new appointments, as well the lack of ICU beds, equipment, materials and trained human resources. This compromise not only the care of patients who have the possibility of improvement, but also all actions necessary to develop the process of organ and tissue donation[6].

Based on these observations, the following research question was formulated: what are the factors related to the structure, process and outcome of organ and tissue donation for transplantation?

It is relevant to study the factors related to the structure, process and outcome so that we may be able to detect any weaknesses that may interfere with the effectiveness of donations, and thus, provide a basis for planning actions that improve the quality of care provided to PDs, resulting in greater viability of organ and tissue transplantations and higher success rates.

Given the above, this study aims to analyze the factors related to the structure, process and outcome of organ and tissue donation for transplantation.

METHOD

The study was approved by the Research Ethics Committee under No. 414/10 and CAAE 007.0.294.000-10, according to the norms of Resolution 466/2012 of the Brazilian National Health Council, as regards the ethical aspects observed when conducting research involving human subjects.

Analytical study with longitudinal design and quantitative approach, conducted in six hospitals units in the city of Natal (RN), of which three were from public hospitals and three were from private hospitals, all accredited by the National Transplant System (SNT) for withdrawal and organ and tissues transplant, as well as Notification, Procurement and Organ Donation Center (CNCDO) and Organ Procurement Organization (OPO) of the mentioned state. The data collection process took place between August 2010 and February 2011.

A random sample without replacement was composed by 65 PDs of organs and tissues for transplantation, calculated from the annual average of the PDs assisted in hospitals from Natal (RN) during the years 2005 to 2009, and selected from the following inclusion criteria: score 3 on the Glasgow Coma Scale; cause of coma defined by computed tomography; personal and family identification that could be responsible for authorizing or not the donation. As the exclusion criteria were: evidence of communicable diseases, cancer and injecting drug use detected before the opening of BD protocol, neurological improvement and refusal of the family to participate in the study.

Data were collected daily through structured script of non-participant observation, checklist type, composed of the following parts: PD characterization; donation structure of hospitals where the PDs was hospitalized; process of organ and tissue donation; data on the result of the donation. Institutional documents such as book records and medical charts were also used.

For purposes of this study, the definition of the triad structure, process and outcome are endorsed in the conceptual model for quality in health evaluation[7]. Thus, it was defined as a structure of organ and tissue donation the necessary resources to the care process, covering the physical structure, material resources, human resources and organizational structure[7-9].

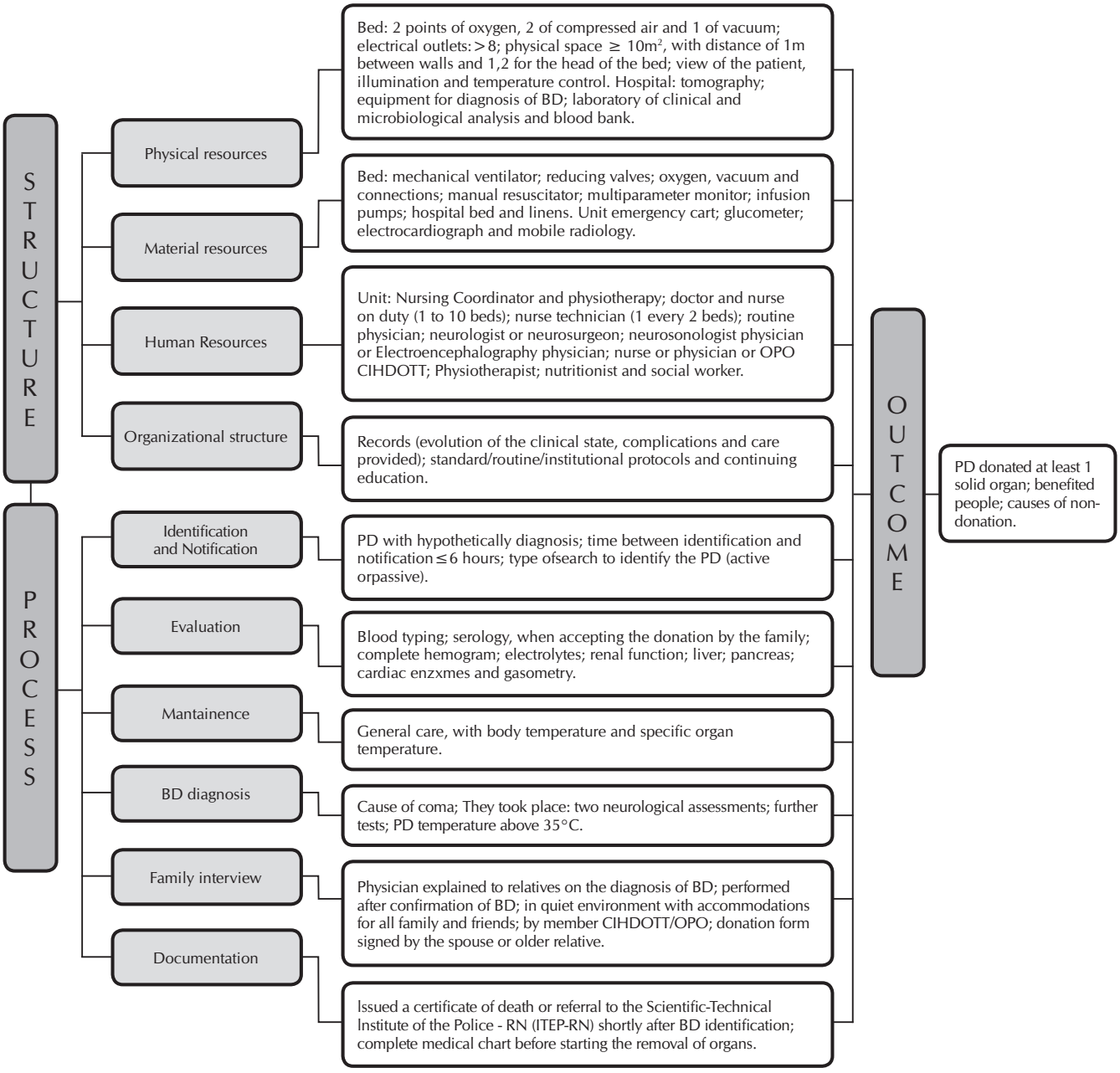

Figure 1 - Parameters used to verify the structure, process and outcome of organ and tissue donation for transplantation, Natal, Rio Grande do Norte, Brazil, 2014

As for the process of organ and tissue donation[7] were included: identification, notification, evaluation and maintenance of PD, BD diagnosis, family interview, BD documentation and logistics[3-4,8-15]. The result corresponds to the consequences of the health service activities[2,7].

Figure 1 presents the parameters used to check the structure, process and outcome of organ and tissue donation.

At the beginning of the research, we requested the consent of the spouse or relative up to second degree of the PD to participate in the study by signing the Consent Form (CF). We proceeded to the data analysis using descriptive statistics, presenting them in tables. To check the level of significance we used the chi-square test ($\chi 2$). To the results lower than 5, we considered the Fisher's exact test. The significance level of 5% ($p < 0.05$) was adopted. Thus, we used Microsoft Excel® 2007 and the statistics software SPSS version 20.0.

RESULTS

For better understanding and comprehension, the results will be presented in four stages: sociodemographic characteristics, factors related to the structure of hospitals, factors related to organ and tissue donation process and the outcome of the organ and tissue donation for transplantation.

1. Socio-demographic characterization of organs and tissues for transplantation of PDs

In tracing the PDs profile, it was observed that 50.8% were male, age up to 45 years (53.8%), mean age 42.3 years, minimum of 5 and maximum of 73 years (± 17.32 years), who had as cause of BD a stroke (53.9%), followed by Traumatic Brain Injury (TBI) (40.0%). As to the place of hospitalization, 64.6% of PDs were hospitalized in ICU beds and 36.4% in emergency units.

2. Factors related to the structure of hospitals

Table 1 shows the results for the factors related to the structure of hospitals where the PDs were hospitalized.

In physical resources, five items were not present in 65 hospitalizations. Of these, we highlight PDs' view of the patient (78.5%), necessary outlets to connect the electrical equipment (63.1%) and physical space (60.0%). The temperature control was adequate in a lower percentage (20.0%), with a higher proportion of inadequacies (58.5%) in the inpatient unit of the non-donor.

In material resources, it was found that eight items were not available in all hospital admissions, especially linens (83.1%), infusion pumps (75.4%), manual resuscitator (69.2%) and hospital beds (67.7%). It is noteworthy that 32.3% of PDs remained in hospital stretchers. In the sector where the PD was admitted, there were: an electrocardiograph (69.2%), a glucometer (67.7%) and a mobile radiology unit (67.7%).

As for human resources, the lowest quantity of professionals related to clinical nurses and routine physicians, with the same percentage (67.7%), technical manager (66.2%) and lowest percentage (46.2%) of nursing technicians was ideal.

Regarding the organizational structure, there was the existence of continuing education programs (95.4%); Records of the evolution of the clinical state, complications and provided care (70.8%); care protocols (13.8%). However, no hospitals presented specific protocols for BD patients. There was no statistical significance between the structure of hospitals between hospitalized donor and non-donor.

3. Factors related to the process of organ and tissue donation for transplantation

In the stages related to the donation process (identification and reporting, evaluation and maintenance of PD, diagnosis of BD, family interview and documentation), it was found that in the PD identification and notification stage,

Table 1 - Factors related to the structure of hospitals, Natal, Rio Grande do Norte, Brazil, 2014

Structure of hospital units	Donor		Non-donor		Total		$\chi 2$
	n	%	n	%	n	%	p value
Physical resources							
Gas supply and vacuum	18	27.7	47	72.3	65	100.0	-
Apparatus determine the cause of BD	18	27.7	47	72.3	65	100.0	-
Blood bank	18	27.7	47	72.3	65	100.0	-
Laboratory	18	27.7	47	72.3	65	100.0	-
Illumination system	18	27.7	47	72.3	65	100.0	-
Apparatus for diagnosis of BD	18	27.7	46	70.8	64	98.5	0.723
View of the patient	13	20.0	38	58.5	52	78.5	0.449
Electrical outlets	12	18.5	29	44.6	41	63.1	0.711
Physical space	12	18.5	27	41.5	39	60.0	0.497
Temperature control	4	6.2	9	13.8	13	20.0	0.743*
Material resources							
Vacuum and connections	18	27.7	47	72.3	65	100.0	-
Emergency carts	18	27.7	47	72.3	65	100.0	-
Oxygen and connections	18	27.7	47	72.3	65	100.0	-
Mechanical ventilator	18	27.7	47	72.3	65	100.0	-
Reducing valves	18	27.7	47	72.3	65	100.0	-
Multiparameter monitor	18	27.7	46	70.8	64	98.5	0.723
Linens	13	20.0	41	63.1	54	83.1	0.142
Infusion pumps	14	21.5	35	53.8	49	75.4	0.528
Electrocardiograph	13	20.0	32	49.2	45	69.2	0.746
Manual resuscitator	14	21.5	31	47.7	45	69.2	0.271
Hospital bed	13	20.0	31	47.7	44	67.7	0.629
Glucometer	13	20.0	31	47.7	44	67.7	0.629
Mobile radiology	12	18.5	32	49.2	44	67.7	0.913
Human Resources							
Social worker	18	27.7	47	72.3	65	100.0	-
Nurse/physician OPO	18	27.7	47	72.3	65	100.0	-
Nursing coordinator	18	27.7	47	72.3	65	100.0	-
Physician on duty	18	27.7	47	72.3	65	100.0	-
Neurologist / Neurosurgeon	18	27.7	47	72.3	65	100.0	-
Neurosonologist/Electroencephalographist	18	27.7	47	72.3	65	100.0	-
Physiotherapist	15	23.1	37	56.9	52	80.0	0.485
Nutritionist	13	20.0	36	55.4	49	75.4	0.472
Clinical Nurse	12	18.5	32	49.2	44	67.7	0.568
Routine physician	12	18.5	32	49.2	44	67.7	0.568
Technical manager	12	18.5	31	47.7	43	66.2	0.957
Nurse technician	12	18.5	28	43.1	30	46.2	0.409
Organizational structure							
Continuing Education	18	27.7	44	67.7	62	95.4	0.371
Documentation and registration	13	20.0	33	50.8	46	70.8	0.873
Rules/Routines/Protocols	4	6.2	5	12.3	9	13.8	0.205*

Note:
**Fisher's exact test*

Table 2 - Evaluation of potential donor organs and tissues for transplantation, Natal, Rio Grande do Norte, Brazil, 2014

Evaluation of the potential donor	Donor		Non-donor		Total		$\chi 2$
	n	%	n	%	n	%	p value
Blood typing	18	27.7	40	61.5	58	89.2	0.083
Electrolytes	13	20	39	60	52	80.0	0.332
Renal function	14	21.5	38	58.5	52	80.0	0.782
Complete hemogram	13	20	39	60	52	80.0	0.332
Lung function	13	20	33	50.8	46	70.8	0.873
Pancreatic function	4	6.2	20	30.8	24	36.9	0.107*
Serology	18	27.7	2	3.1	20	30.8	<0.001*
Heart function	5	7.7	11	16.9	16	24.6	0.714
Liver function	3	4.6	8	12.3	11	16.9	0.643*
Microbiological cultures	1	1.5	0	0	1	1.5	0.277*

Note:
**Fisher's exact test*

Table 3 - Potential donor maintenance of organs and tissues for transplantation, Natal, Rio Grande do Norte, Brazil, 2014

Potential donor maintenance	Donor		Non-donor		Total		$\chi 2$
	n	%	n	%	n	%	p value
Hematologic function	18	27.7	37	56.9	55	84.6	0.033
Cardiovascular function	17	26.2	34	52.3	51	78.5	0.047*
Respiratory function	15	23.1	34	52.3	49	75.4	0.281*
Endocrine and metabolic function	16	24.6	31	47.7	47	72.3	0.057*
Liver function	11	16.9	35	53.8	46	70.8	0.223
General care	15	23.1	30	46.2	45	69.2	0.108*
Renal function	15	23.1	23	35.4	38	58.5	0.011*
Care with corneas	15	23.1	22	33.8	37	56.9	0.007*
Balance of electrolytes	10	15.4	26	24.6	36	55.4	0.986
Infection Control	12	18.5	23	35.4	35	53.8	0.199
Body temperature	16	24.6	15	23.1	31	47.7	<0.001*

Note:
**Fisher's exact test*

Table 4 - Brain death diagnosis, Natal, Rio Grande do Norte, Brazil, 2014

Brain death diagnosis	Donor		Non-donor		Total		Fisher's exact test
	n	%	n	%	n	%	p value
Identifies cause of coma	18	27.7	47	72.3	65	100.0	-
Performs the additional examination	18	27.7	33	50.7	51	78.4	0.006
Performs neurological assessments	18	27.7	31	47.7	49	75.4	0.002
Hypothermia exclusion	15	23.1	31	47.7	46	70.8	0.141

everyone had diagnosis hypothesis recorded in the charts, the average time between the identification and reporting of PD occurred in less than 12 hours period (100.0%), and the identification took place by active search in most cases (89.2%).

As the evaluation stage of the PD organs and tissues for transplantation, it was found that in the routine laboratory tests, the most performed one was the blood typing (89.2%), collected from all donors. However, in 10.8% of non-donors, it was not performed. The kidney function tests, complete hemogram and electrolytes in 80.0% of PDs, and lung function in 70.8%; The tests to assess pancreatic, cardiac and liver functions were performed in a smaller percentage, with 36.9%, 24.6% and 16.9%, respectively; serology was performed for all PDs whose family authorized the donation (30.8%). Thus, it was performed on all donors and 3.1% of non-donors, with statistical significance ($p<0.001$). The microbiological cultures were performed in only 1.5%, which corresponds to one PD that was the donor (Table 2).

Table 3 shows the data related to maintenance of PD. It is observed that the predominant maintenance care, in both groups, refers to hematological function, whose outcomes are present in all donors and 56.9% of non-donors. The most performed care in the donor are those relating to cardiovascular functions (26.2%) and endocrine-metabolic functions (24.6%). On the care of body temperature, despite being one of the most performed in the donor (24.6%), we observed in the records as the least frequently care in non-donors (23.1%). However, it was found that in the donor, the least performed care was the balance of electrolytes (15.4%).

The results of the PD maintenance show statistically significant difference between the performance of cardiovascular function ($p=0.047$), renal function ($p=0.011$) care, care of the corneas ($p=0.007$) and body temperature ($p<0.001$).

Table 4 presents the data for the BD diagnosis. It is observed that in 100.0% of PDs were identified the cause of coma; the majority (78.4%) held the complementary test for the BD diagnosis, but 20.6% of non-donors did not undergo this test; in 75.4% conducted two neurological assessments, with 24.4% of non-performance in non-donors. The exclusion of hypothermia was performed in 70.8% of PDs. Thus,

hypothermia was present in 4.7% of donors and 24.6% of the non-donors.

The results related to the BD diagnosis showed statistically significant difference between performing further examination (p=0.006) and neurological assessments (p=0.002) on the donor and non-donor.

As for the family interview, 37 (56.9%) family members participated. Of these, 20 (30.8%) consented to donation. This moment occurred, in 100.0% of the time in a calm environment, with accommodations for all family members and friends who wanted to participate, with an OPO or CIHDOTT professional. We proved the preparation of the professional for the procedure. As for the relatives responsibles for the donation in 100.0% of cases were in accordance with the rules: children (24.3%), siblings (24.3%), mother (19.0%), spouse (16.2 %) and father (16.2%).

On the documentation of BD, from the 49 PDs in which the protocol was closed, it was found that in 12.2% of cases, the death certificate or referral to the ITEP-RN (Scientific-Technical Police Institute- Rio Grande do Norte) was soon filled after the performance of the last test (neurological or complementary) with the time of this examination. It is noteworthy that 88.8% of 18 medical records of donors were found complete before the organ extraction: BD protocol, death certificate or referral to the ITEP, donation term and information about the time of start and end of the extraction.

The last stage of the process is about the logistics aspects. It was observed that in 100.0% the materials needed for the organs and tissues capture and transportation procedures were provided by OPO professional as well as the schedule of the operating room, the cooling box, the solutions for cryopreservation and ice.

4. Factors related to the outcome of organ donation for transplantation

From 65 identified and notified PDs, 27.7% implemented the donation. In 100.0% of donors kidneys were donated; in 88.9% corneas; in 44.4% the liver; in only one (5.6%) the heart. One liver was disposed due to perfusion that was not carried out properly, four corneas were discarded after analysis of eye tissue bank. Thus, 68 people benefited with the organs and tissue donated through kidney (53.8%); cornea (35.3%); liver (10.3%); heart (1.5%) transplants. The causes of non-effectiveness of the donation were family refusal (34.7%); no protocol has been closed for the diagnosis of BD (24.6%); Medical contraindication (22.6%); and heart failure (7.1%).

DISCUSSION

The PDs' characterization are pilled up in the literature, when reinforces the profile of these individuals, traumatic causes changed to stroke and thereby justified the similarity in the percentage of men and women found in the present study[2,15].

As for the distribution by age, it was found that the age range varied from 5 to 73 years, with a mean 42.3 years. These results are reinforced by the scientific literature, which shows that most PDs are young adults of working age[16-17]. Thus, we consider our sample a group of heterogeneous people in age, since it involved from children to the elderly. As for the medical diagnosis, the findings of this study are similar to ones of the Brazilian registry of transplants, in which strokes stood out as the main cause of BD, followed by TBI[2].

As regards the information sector, it reinforces that the care with multiple organ PD should be held preferably in the ICU because they require continuously specialized professional attention, specific materials and technologies necessary for the diagnosis, monitoring and therapy[8-9]. However, it was observed that 35.4% of the PDs were kept in the emergency room. This fact occurs due to the lack of ICU beds in the state of Rio Grande do Norte. Similarly, it also occurs in most Brazilian states, where emergency services have lost their initial service feature, reconfigured as patient overcrowded units with people who remain for days and even weeks in hospital stretchers waiting for a place in a ward or ICU[6].

It is known that the donation and transplantation of organs and tissues depend on factors related to the physical, technological, and sufficiency of qualified professionals to meet the needs of PDs and their families[8]. Against these recommendations, it was observed in the present study, the deficiency of physical resources for assistance to the PD, such as: view of patients, electrical outlets for connecting electrical equipment, physical space and adequate temperature control.

Critically ill patients must be located so that they are visualized, direct or indirect, at all time, in order to allow monitoring under routine circumstances and emergency. In addition there is the need for fundamental electronic equipment for monitoring and therapy, as well as the availability of electrical outlets to connect these devices[8]. Therefore, the physical area to care for the PD on the one hand, should be sufficient to hold all the equipment and allow free movement of service staff; and on the other hand, temperature control must remain stable, avoiding excessive air displacement and maintain the relative humidity in order to maintain normothermia of the PD[8-9].

Regarding the materials for assistance to PD, there was a lack of essential accessories for the production and maintenance of care, such as: manual resuscitator, infusion pumps, linens, electrocardiogram, glucometer and hospital bed. For each bed of the PD there must be a manual resuscitator, widely used in respiratory therapy, in the suction of endotracheal secretions and resuscitation procedures[8].

For the assistance of the PD, the recommendation is to also use infusion pumps to control the infused liquids, enteral nutrition and especially vasoactive drugs used in the care of PD, as well as linens such as sheets and blankets to keep them warm. In addition, hospital beds should be available with position adjustment, side rails and wheels, both for elevating the head of the bed as for changing positions and transport of the patient. In the sector where the PD is, there should be a electrocardiograph for analysis of heart diseases, especially arrhythmias are very common in these patients, and also glucometer to measure capillary blood glucose[8].

It should be noted that the shortage of materials emerges as a major problem at work and implies the need for search and loss of time that could be dedicated for care. The lack

of materials also leads to improvisation, often inadequate, for care. The fact of seeking conditions to perform the work, combined with the situation of not always finding them arouse feelings of irritation and fatigue at work[17].

It is agreed that, in order to boost the number of transplants with BD patients, professionals should ensure proper preservation and subsequent viability of organs to the extraction. This implies investments in specialized materials and equipment, and professional staff trained to identify and diagnose BD and, above all, perform the maintenance care of organs and tissues and hold family interview[10,12-13].

Data from this study demonstrate forcefully the failure of professionals to assist the PD, against the regulatory requirements of proper quantification of the team as essential for quality care and part of the service structure. Both contribute to the attainment or maintenance of favorable conditions in the workplace[17].

With regard to the organizational structure, there was a lack of records on the evolution of the clinical status, on the complications and on care to the PD. Strangely, most hospitals have continuing education program. In a few (13.8%) services there were records of institutional rules and routines or administrative assistance and protocols performed together in the unit.

We highlight the difficulty to maintain and facilitate the PD with inadequate records. It is known that the absence of records interferes with communication between members of the multidisciplinary team, which provide subsidies on the assistance provided, ensuring communication and continuity of the information within 24 hours, which is essential for a complete understanding of the patient. They also provide legal support and hence security, since they are the only documents that record all actions of the PD[11].

Regarding the actions related to the donation process, it was found that the greatest problems occurred on the steps of evaluation, diagnosis of BD, maintenance of PD and documentation of BD. The evaluation favors to obtain grafts, preventing the transmission of infectious or neoplastic diseases. However, it was observed that the tests for evaluating pancreatic, cardiac and hepatic function are not performed in most developed countries. These tests are designed to detect and treat complications of BD, ensure good cardiac contractility and hemodynamic stability, reducing the loss of donors by cardiovascular collapse and increasing post-transplant survival[12-13].

Regarding microbiological cultures, data from this study contradict those recommended in the literature. Discordant points relate to screening procedures infections including blood and urine cultures every 24 hours review of recent data and microbiological infections previously treated. It is agreed that, although there is no evidence on the frequency with which the cultures in developed countries, there are recommendations that they should be repeated every 24 hours or suspected infection[13].

As for the maintenance of PD, studies have proposed management protocols to address the physiological changes resulting from BD, although highly variable, have three similar basic aspects: early identification of PD; ICU admission by qualified staff; and early aggressive fluid resuscitation, vasopressors and hormone therapy even before the consent for donation is obtained[10-12]. However, there was significant difference between the performance of maintenance care related to hematologic, cardiovascular, endocrine-metabolic and kidney functions, corneas and temperature in the donor and non-donor.

The maintenance of hematological, cardiovascular, endocrine-metabolic and renal function minimizes the loss of organs for transplantation, it promotes the adequacy of oxygen delivery to tissues, hemodynamic stabilization, energy supply to tissues and electrolyte control. In the care of the corneas must be held humidification and protective occlusion of the eyes to avoid desiccation. Caring for the temperature to normothermia seek to guarantee various biological phenomena, especially the hemodynamic control[15].

Regarding the diagnosis of BD, it is considered essential that standardized criteria and unified by the CFM Resolution 1480/97 are followed so that the confidence of this phenomenon is (re) built. Thus, it should be registered in the medical record the structural causes of known origin that has irreversible character; perform brain CT scan; away from situations that mimic coma or neurological activity failure; perform both neurological tests as well as the complementary test[3,14].

About the documentation after the process of determining BD, we call attention to the record, in the patient, all tests performed, and doctors who participated in the diagnostic process must complete and sign the Brain Death Declaration. From the medical and legal point of view, the BD matches the patient's death, even if it is with cardiopulmonary conditions kept artificially. Contradicting the result of this study, the time to be entered on the death certificate refers to the time of BD characterization at the end of the BD determining process[11,14].

As the result of the donation, it appears the similarity with other studies conducted in Brazil on this theme, where we highlight the kidneys and corneas, respectively[2,16]. In these studies, no donation appears as predominant outcome. Family refusal prevailed among the causes of non-donation. This is a limiting factor for the donation, but it is known that, in the face of numerous deficiencies and little credibility the public health system and facing the fear of the unknown, it is difficult to attribute to families the only negative responsibility for the organ donation[18].

In addition, despite the considerable increase in the number of donations and transplants in the state of Rio Grande do Norte, which in 2009 showed 2.6 donors per million population (pmp) and in 2012 over 16.4 pmp, limiting factors still coexist such as lack of appropriate infrastructure and skilled human resources to perform the steps of the donation process and thus increase the number and quality of the grafts offered to the population[2].

It is considered that the data obtained in systematic observations indicate that the structure and the process that determined the outcome in 27.7% of PD implemented the donation. These donations indicators are compatible with the majority of Brazilian states, but below rates as those found in Spain, which has 34.8 pmp donation rates, with familiar negative of 15.6%. Spain can convert 86.7% of its PDs in at least one organ donor transplant[18].

The study was conducted according to the established schedule, being classified as relevant as the availability of relatives of PDs and professionals who allowed us to conduct these systematic observations. It is noteworthy, with the same importance, the participation of undergraduate research students in data collection. It was classified as a study limitation the absence of data in the instrument collection concerning to the causes of family refusal, so that it could be verified that the lack of adequate structure of hospitals and the development of inadequate process have influenced the negative of the donation family members who were interviewed.

CONCLUSION

It was found that the structure of hospitals where PDs were hospitalized showed deficiencies in physical, material and human resources for the PD, and the lack of adequate records and care protocols. In activities related to the donation process, it was observed that the main problems were related to the stages of evaluation, diagnosis of BD, maintenance of PD and documentation of BD, with the highest proportion for non-donor care. In the result, it was observed that 27.7% of PDs have become donors, consistent with national rates.

It is noteworthy, therefore, that there is urgency in taking steps to structure the hospitals with physical resources, materials and technology necessary to maintenance of the PDs and the diagnosis of BD, according to the legislation. We also highlight the importance of better training for health professionals and continuing education to qualify those who are already working as health professionals, especially on subjects related to donation and transplantation. Besides that, there is need for educational programs directed to the population in order to reduce the family refusal and thereby increase the number of donations and transplants.

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