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PROFILE OF ORGAN AND TISSUE DONORS IN BRAIN DEATH IN THE SANTA CASA DE MISERICÓRDIA DE PASSOS, MINAS GERAIS, IN 2024

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Abtract: Objective: This study aims to identify the profile of organ and tissue donors from Santa Casa de Passos, Minas Gerais. **Methods**: This is a cross-sectional study with descriptive analysis of medical records obtained from the institution, from January 2024 to January 2025. Data collection was performed in 38 medical records of patients with cephalic death confirmed in the period evaluated. **Results**: Patients were aged between 2 and 75 years, 50% male. The main causes of death were cranioencephalic trauma - TBI (31.5%) and stroke (26.3%). The most frequently used complementary brain death test was the electroencephalogram (94.7%). In the end, 25 patients remained to perform the organ and tissue donation procedure. Family refusal (15.7%) was the main cause of non-donation. The most donated organ was the kidney, with 44 in total. **Conclusion**: The recognition of the potential donor, the efficiency for the implementation of the protocol and the proper maintenance of these patients are essential to succeed in the donation process.

Keyword: Consent for Organ Donation. Hospital Medicine. Cheers. Donor Selection. Organ Transplant. Tissue Transplants

INTRODUTION

Brain death is defined by total and irreversible loss of brain function, i.e. loss of cortical functions and brainstem. Its evolution triggers hemodynamic, hormonal and metabolic disorders that affect the body's homeostasis in a progressive and definitive manner. From its identification, there is a new concept of "death" that involves moral, ethical and legal aspects t hat are directly related to the organ transplant policy.[1]

The Brazilian legislation that discusses the subject was developed by the Federal Council of Medicine (CFM), Resolution CFM 1.480/1997, which was subsequently updated by Resolution CFM 2.173/2017[2] document that defines precise, well-established and standardized criteria, with protocols for the diagnosis of brain death validated throughout the national territory.[3]

The protocol for the identification of brain death should be applied to all patients wit h non-perceptive coma, absence of supraspinatus reactivity and persistent apnea, provided that patients meet the pre-established requirements. For its confirmation, two confirmatory clinical examinations of the absence of brain function are required, followed by the apnea test and, finally, a complementary examination to reaffirm the absence of brain activity. Therefore, to say that the patient is in brain death, all stages of the process must be completed.[2]

After the completion of all the aforementioned steps, the protocol is closed and the diagnosis of brain death is completed. At this time, the family of the deceased can be approach ed regarding the donation and transplantation of organs and tissues, the performance of infectious screening tests and other tests as regulated by the Ministry of Health.[4]

The lack of information, false or exaggerated news, lack of permanent education on transplantation and donation of human organs, is the reason for many issues to intervene in the decision that can save a life. Thus, it is necessary to build a continuous learning environment for the general population on this topic so relevant that, when correctly explained, it can generate many benefits for society.[5]

Studies show that when family members understand well the concept of brain death and understand that the brain is responsible for maintaining cognitive, emotional, breathing, speech, swallowing, movements, among all its other functions, these are more favorable to the organ donation process than those families that have little understanding on the subject.[6]

On July 17/2024, 43,845 people are waiting on a waiting list for organ transplantation in Brazil. The organ with the longest waiting row is the kidney, with 40,521 demands.[1] So me studies have been conducted to verify the profile of organ and tissue donors in Brazil.[7-10] Data from the state of Minas Gerais show a tendency to increase the number of transplants, similar to the national scenario. However, there are no published studies on the profile of patients diagnosed with brain death and the implementation of organ transplantation in the South region of Minas Gerais.

Thus, a detailed analysis of the profiles of these donors can optimize the donation and transplantation process, through the improvement of capture strategies, increased efficiency of the transplant system and the development of more effective health policies. Local data analysis may reveal demographic, clinical and socioeconomic characteristics that influence organ donation, as well as identify barriers and process facilitators.

Given the above, this study aims to define the epidemiological profile of organ donors, as well as the main causes of brain death, in a Hospital South region of Minas Gerais.

METHODOLOGY

This qualitative study used a retrospective approach to analyze organ donation data in Santa Casa de Passos during a period from January 2024 to January 2025. This place is a regional philanthropic hospital that serves the entire population of the southwest of Minas Gerais, consolidated as an important center of health care.

Data were collected from medical records of patients who were made available by the institution. The collected data were allocated in an Excel spreadsheet for further analysis and construction of graphs.

The demographic data of donors (age, sex, marital status, profession, etc.), types of organs donated, clinical conditions of donors, acceptance and refusal rates of donation, and factors associated with the availability and use of organs for transplantation were used. Data were analyzed descriptively.

Ethical aspects

The study was approved by the Research Ethics Committee of the Santa Casa de Misericórdia de Passos (SCMP), linked to the CEP-CONEP System, N: 7255312 and is register ed under CAAE number: 85011924.9.0000.8043.

RESULTS AND DISCUSSION

Epidemiological profile

The age of donors ranged from 2 to 75 years old, 65.8% were older than 40 years old (Figure 1). Rabello et al.[10] analyzing the profile of donors due to cephalic death in a hospital in Porto Alegre observed a higher frequency of donors older than 30 years.

However, Rabello et al.[10] analyzed cephalic death according to age and realized that the cause of death by cranioencephalic trauma - TBI is higher in patients under 30 years of age. This fact is probably linked to factors such as the beginning of independence in traffic, sports practice and higher risk activities, as well as behaviors such as alcohol consumption, which increase the risk of accidents and aggression.

Donors were composed of 50% female and 50% male, mostly married or single (Figure 2). This proportion in relation to sex differs from the studies by Bertasi et al.[9] and Rabello et al.[10], of which found a higher prevalence of males, 57.39% and 55.9%, respectively.

Regarding life habits, it was found that the majority (63.2%) did not have life habits that included the use of drinks, drugs or smoking. However, this practice was observed in 14 donors, who could practice more than one of these habits (Figure 3). Fishman and Grossi[11] emphasize the importance of making a careful assessment of possible donors, because some life habits, such as drug use, tobacco and alcohol, can compromise the transplant and the health of the recipient and cause future complications.

Patient clinical profile

The main causes of brain death were TBI and stroke (Figure 4). According to Westphal et al.[12], these two causes of death, together generally correspond to more than 90% of potential organ donors. The studies by Bertasi et al.[9] and Rabello et al.[10] showed a higher percentage of cause of brain death due to stroke, followed by TBI.

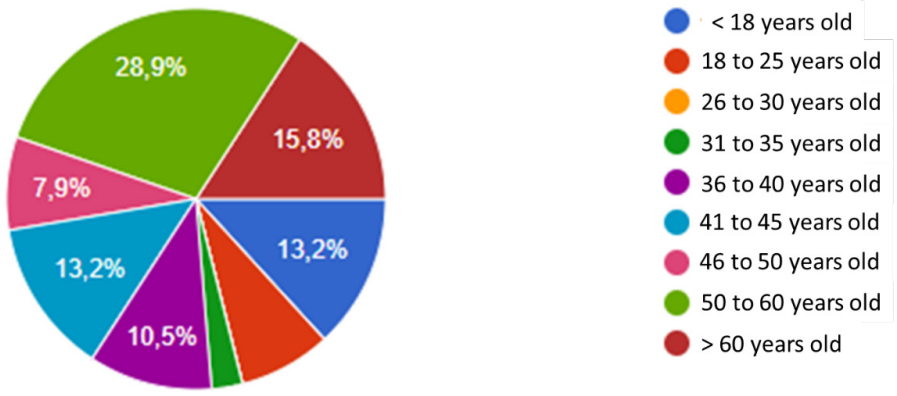

Figure 1 – Age of donors. N = 38.

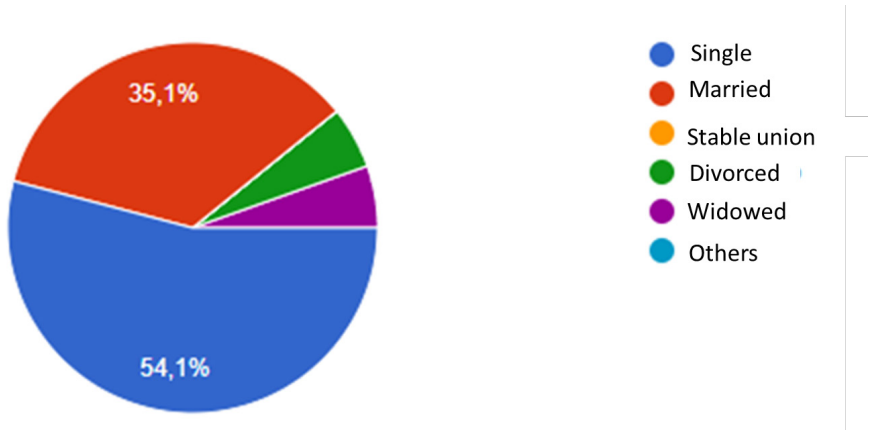

Figure 2 – Civil status of donors. N = 38.

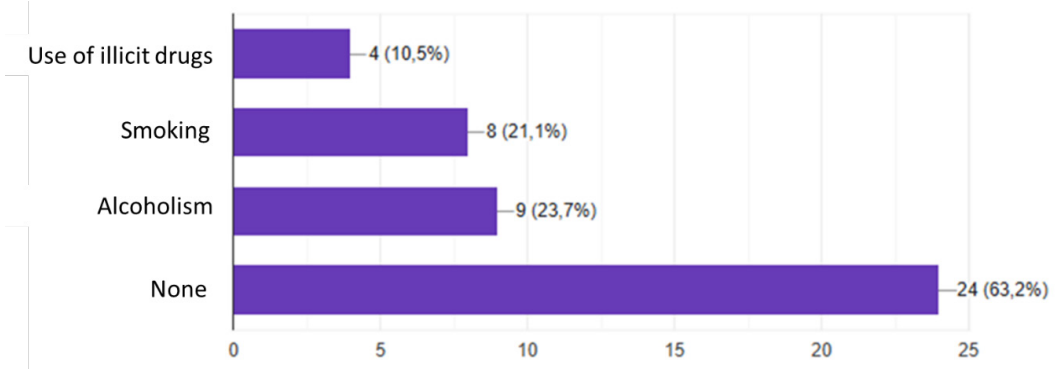

Figure 3 – Life habits of donors. N = 38.

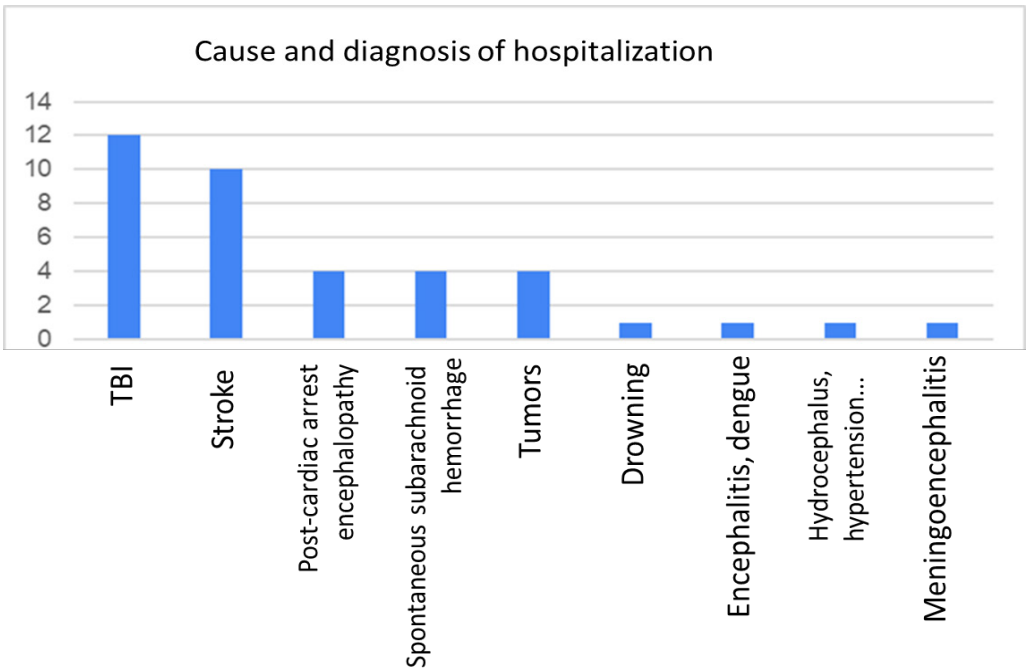

Figure 4 – Causes of brain death of donors

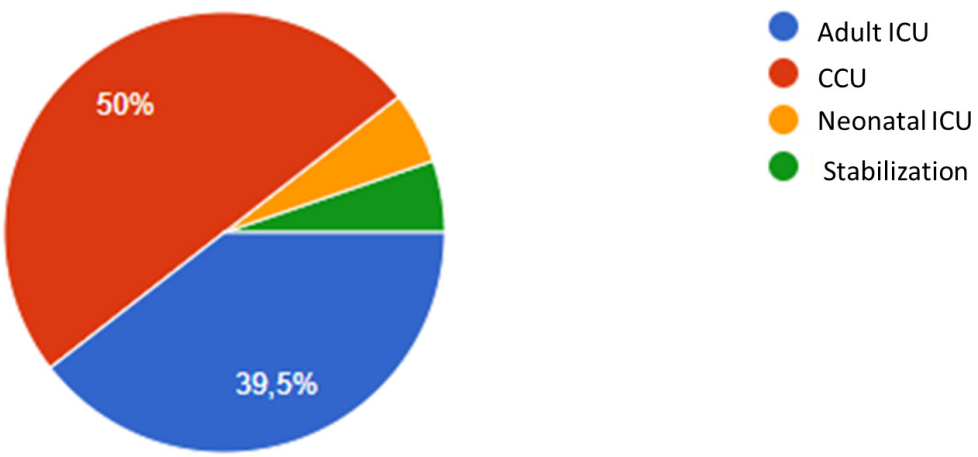

Figure 5 – Place of performance of the protocol

The National Data Reports[13] also reports that among the main causes of brain death are head trauma, cerebrovascular accidents and anoxic encephalopathy. Brain death presents several important pathophysiological changes, requiring intensive care and measures with the potential donor to allow the viability of organs and enable better transplant conditions to the recipient.[14]

Donation procedures

It was observed that the procedure for performing the donation protocol generally occurred in the Intensive Care Unit - ICU or in the Coronary Care Unit – CCU (Figure 5). Generally, patients who are detected with brain death are in severe condition and are in these units because they need intensive care.

Among the complementary brain death confirmation tests the electroencephalogram - EEG was the most performed, totaling 94.7% of the cases, although cerebral arteriography (brain angiography) and scintigraphy were performed in one donor each (Figure 6).

In case of confirmation of brain death, the apnea test is usually performed initially, which aims to prove the absence of respiratory response after maximal stimulation with hypercapnia. It is performed after the clinical examinations are completed. Cases of hypotension, hypoxemia and cardiac arrhythmia may occur during the test and lead to its interruption. A positive apnea test is considered in the presence of final arterial blood gas analysis with $PaCO_2$ greater than 55 mmHg, associated with absence of respiratory movements.[15]

After proof of absence of brain function through clinical examinations and absence of respiratory movements through the apnea test, the current legislation requires a complementary examination to demonstrate the absence of electrical activity, metabolic activity or cerebral perfusion. According to the Federal Council of Medicine, complementary exams may be cerebral angiography, EEG, transcranial Doppler and cerebral scintigraphy, confirming that the methods used in the health unit were correct.[2]

The Federal Council of Medicine also points out that the choice of complementary examination is performed according to the patient's clinical condition and local availability.[2] Alcantara[16] stated that EEG is the most performed exam in cases of brain death confirmation and has high reliability.

Results of the donation

After applying brain death protocols, 33 patients were eligible for donation and 5 patients underwent the protocol only for diagnostic purposes. For eligible donors, family members were invited to an interview to approve possible donation. In the end, 25 patients remained to perform the organ and tissue donation procedure. The other patients who were not referred for donation were mainly due to family refusal and situations that prevented the transplant because it offered risks to the recipient, such as positive patients for dengue and HIV (Figure 7).

The family approach on the subject is complex. In general, donation in Brazil and in the world is seen as a gesture of compassion and love. However, when it comes to donation of organs and tissues for transplantation, the theme still has many taboos and obstacles. Surely this is a unique matter that requires a joint family decision. An

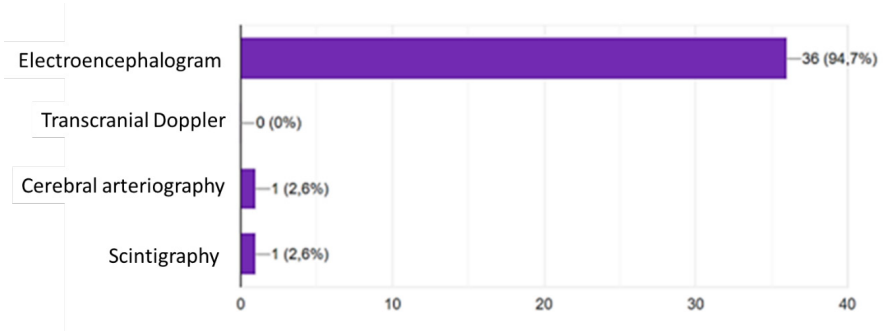

Figure 6 – Complementary examination of confirmation of more brain. N = 38.

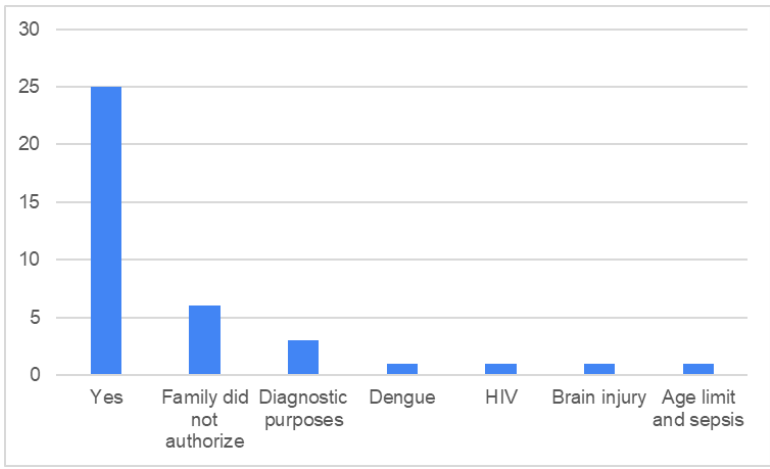

Figure 7 – Data for eligible donors. N = 38.

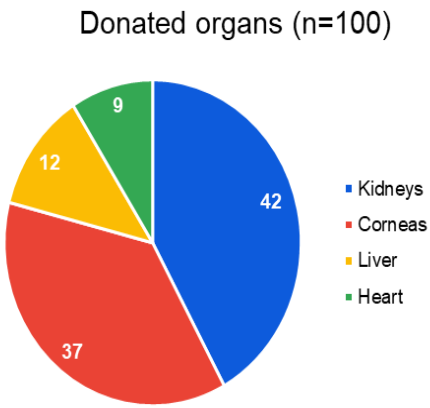

Figure 8 – Data regarding the organs that were donated. N = 100.

ethical, realistic and responsible approach to the facts is extremely important, clarifying any doubts that may be present. Moreover, about the end of life in that body that still breathes through artificial life-support measures.[17]

In the present case, family refusal represented 15.7% for non-donation of organs. This percentage is well below the general average of the country that is indicated by the Brazilian Transplant Registry, of 42% and the state of Minas Gerais, which is 38%.[18] Bertasi et al.[9] Also pointed out 42.8% of family refusal to donate organs in a study at the Hospital das Clínicas da Unicamp, in addition, the authors also verified causes of non-donation due to contra indications (25.75%), cardiorespiratory arrest (21.63%) and positive serology (4.21%), showing that some problems related to the patient can also prevent donation.

According to the historical series from 2001 to 2022 of the National Transplant System of the Ministry of Health, there is a tendency to increase the number of organ and tissue transplants, with a total of 10,422 transplanted organs in 2001 compared to 25,632 transplanted organs in 2022.[1] We highlight a decrease in the number of transplants in 2020, related to t he pandemic by SARS-CoV 2 whose impact was observed on the availability of intensive care beds and adaptations of the health system to the public health emergency.[19]

Ethical issues and effective communication with the families of potential donors are critical aspects in the organ donation process.[20] Understanding communication dynamics and family attitudes can improve consent rates for donation.

Analysis of the profiles of brain- dead organ donors in SCMP is essential to understand and improve the organ donation and transplantation process. This study will contribute to the advancement of organ donation practices, promoting better use of available resources and ultimately saving more lives.

Added to this, prior health and circumstances of death are important factors in the eligibility for organ donation.[21] Analyzing donor clinical data at SCMP may identify patterns that facilitate or hinder donation. Efficient health policies and adequate hospital infrastructure are crucial for increasing organ donation rates.[22] SCMP has implemented several initiative s to improve the donation process, and the analysis of donor profiles can help to evaluate the effectiveness of these measures.

Regarding the organs that were donated, a total of 102 were made available, with a higher proportion of kidneys (43.1%) and corneas (36.2%) (Figure 8). In this sense, it is worth noting that some organs are paired which allows donation to more than one recipient. According to RBT data, on the donor waiting list, corneas and kidneys are those of major highlights in all regions of the country.[18] In the study by Rabello et al.[10] they observed that the kidneys also the most donated organ among the patients evaluated, in 89.8% of the cases.

It is known that organ transplantation remains the main therapeutic option for patient s with acute organ dysfunction or chronic terminal disease.[14] Data from the United States indicate that more than 80% of deceased donors' organs were obtained after brain death.

Brain death is a prerequisite for multiple organ donation. Studies show that the correct acceptance and diagnosis of brain death are crucial factors for the success of organ transplantation.[23] An analysis of donor profiles can provide insights into the prevalence and recognition of brain death in different clinical contexts. Demographic and socioeconomic variables, such as age, gender, educational level and income, influence the willingness to donate organs. [24] Specific studies in regions such as SCMP can reveal local particularities and help direct awareness and education campaigns.

CONCLUSION

This study aims to identify the profile of organ and tissue donors from Santa Casa de Passos, Minas Gerais.

The profile of the patients was age between 2 and 75 years, being 50% male. The main causes of death were cranioencephalic trauma (TBI) and stroke. The most used additional brain death confirmation test was the electroencephalogram. In the end, 25 patients remained to perform the organ and tissue donation procedure, with family refusal being the ma in cause of non-donation. The most donated organ was the kidney.

Organ and tissue donation represents hope for thousands of patients on transplant lists across the country. The recognition of the potential donor, the efficiency for the implementation of the protocol and the proper maintenance of these patients are essential to succeed in the donation process. The work of welcoming and supporting family members of these individuals is crucial for CIHDOTTs to succeed in this process and thus reduce the rates of family refusal.

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