



Bone Tissue Donation: Tendency and Hurdles

S. El Hage^a, M.J. dos Santos^{a,*}, E.L. de Moraes^{a,b}, and L.B. de Barros e Silva^b

^aSchool of Nursing, and ^bOrgan Procurement Organization, Hospital das Clínicas, School of Medicine, University of São Paulo, São Paulo, Brazil

ABSTRACT

Introduction. The aim of this study was to identify the percentage of bone tissue donation in a brain death situation and the tendency of donation rate of this tissue in an organ procurement organization in the county of Sao Paulo from 2001 to 2016. It is a retrospective and quantitative study, based on the Organ and Tissue Donation Term of donors who died of brain death between 2001 and 2016.

Methods. A logistic regression model was applied, and the odds of donation were identified throughout the years, regarding the odds ratio different from zero. Finally, it was measured the accuracy of the odds ratio through the confidence interval.

Results. The analysis has shown a significant change on the trend of bone donation ($P < .001$). In this case, the odds ratio was >1 , indicating that the donation rate has increased. However, the percentage of growth is still considered low.

Conclusions. The study evidences a growth trend regarding the donation of bone tissue, but the percentage is still too low to adequately meet the demand of patients who need this modality of therapeutic intervention. It is believed that educational campaigns of donation are not emphasizing the donation of tissues for transplantation, which may be directly impacting their consent rates.

BONE tissue transplantation is a viable therapeutic alternative that can restore damaged bone and return the quality of life to the individuals that loss owing to trauma or severe diseases [1–3]. Bone tissue can be obtained from a deceased donor and a single bone structure can benefit >20 recipients. However, it is believed that the possibility of donation and therapeutic use of this tissue is unknown to most of the population [2,4,5].

There are few studies related to tissue donation and a much lower number of studies focused on bone grafting. Thus, this study aimed to identify the percentage of donation of bone tissues from donors in a brain death situation and the tendency of the donation rate of this tissue in an Organ Procurement Organization in the county of São Paulo from 2001 to 2016.

METHODS

This quantitative, retrospective study was developed in an organ procurement organization of the county of São Paulo. The research includes all Organ and Tissue Donation Terms of donors who died of brain death 2001 to 2016. After receiving the Research Ethics

Committee's approval and authorization, the data were collected and tabulated in a spreadsheet for statistical analysis as absolute numbers and percentage. To verify the existence of downward tendency or increase in donations of bone tissue, a logistic regression model has been applied, assuming a significant change in the donation rate when $P < .001$. Afterward, the chance of donations over the years was identified, considering the odds ratio different from 1. Finally, it was measured the accuracy of the odds ratio through the confidence interval. The narrower the interval, the better estimated is the odds ratio of the general population.

RESULTS

Of the 1811 terms of authorization of donation of organs and tissues signed between 2001 and 2016 by relatives of

*Address correspondence to Marcelo José dos Santos, PhD, Professor, Department of Professional Orientation, School of Nursing, University of São Paulo, Av. Dr. Enéas de Carvalho Aguiar, 419, São Paulo-SP, Brazil. E-mail: mjosan1975@usp.br

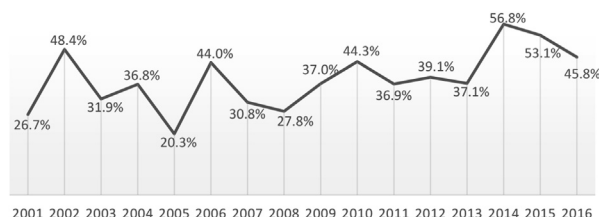


Fig 1. The percentage of bone tissue donation in an organ procurement organization of Sao Paulo city between 2001 and 2016.

donors in situations of brain death, it was verified that the bone tissue donation was authorized in 737 cases (40.69%).

Fig 1 demonstrates that the percentage of donation of bone tissue is predominantly <50%. It is evidenced that the lowest donation rate occurred in 2005 (20.3%) and the highest in 2014 (56.8%). In the last 3 years, there has been a decrease in bone donation rates.

Statistical analysis showed a significant change in the donation of bone tissue ($P < .001$). In this case, the odds ratio identified is 1057, which is >1 , indicating that the donation rate increases over the years (Fig 2). It can be interpreted that, each year, the chance of bone donation increases by 5.7% [$(1057 - 1) \times 100$]. Finally, the accuracy of the odds ratio was measured by means of the 95% confidence interval, with a lower and upper limit equivalent to 1033 and 1081, respectively.

DISCUSSION

The use of bone grafts from musculoskeletal tissue banks to fix orthopedic issues has increased significantly owing to the impossibility of obtaining large amounts of autologous bone, the increasing number of orthopedic surgeries, and the development of new surgical techniques that depend on this tissue [6,7]. The maintenance of the banks of musculoskeletal tissues depends on the donation of this tissue for

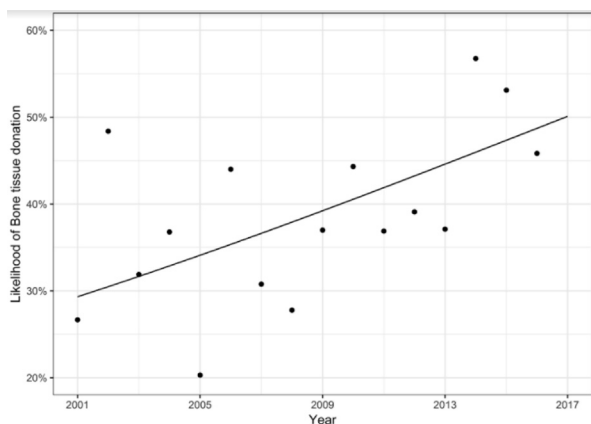


Fig 2. Logistic regression of bone tissue donation.

processing, storage, and availability for surgical procedures. Consistent with this need, this study shows that the permission for removal of bone tissue shows a trend of growth [6].

Although this research presents these positive data, it is verified that the rate of donation of bones is still low even among those who consented to the extraction of the organs of their relative for transplantation. This finding may be related to the population's lack of knowledge about the possibility and importance of donating bone tissue for surgical procedures [1,4,5].

A study produced in an organ procurement organization in Ribeirao Preto, Brazil, found that 94.7% of the relatives of effective donors stated that they knew about "Donation and transplantation of organs" and its importance. However, 97.3% reported total ignorance about "Bone tissue donation and transplantation." The same study also showed that more than one-half of the families interviewed about donation of their relatives (62.7%) did not receive a request for donation of bone tissue, and among the families that received a request for donation of bone tissue, 92.9% did not receive information about the bones that would be removed and 96.5% did not receive information about how the donor's body would be reconstituted [5]. In this sense, it can be inferred that faults in the family interview for donation may also be contributing to the low rates of donation of bones [1,5]. The lack of knowledge about the procedure of extraction and reconstitution of the donor's body, the distaste about the idea of mutilation of the body, and the possibility of not preserving the donor's appearance are also pointed out as reasons for refusal to donate bone tissue [1,4,5].

This study is limited to an analysis of the quantitation and tendency of bone tissue donation of deceased donors in a situation of brain death. However, it is important to conduct further studies to identify the reasons for refusal to donate bone tissue, as well as the causes of nonextraction or tissue use when donated.

In conclusion, this study demonstrates a growth trend regarding the donation of bone tissue, but the percentage is still too low to adequately supply the demand of patients who need this modality of therapeutic intervention. It is believed that educational campaigns of donation are not emphasizing the donation of tissues for transplantation, which may be directly impacting their consent rates.

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