Quantitative Survey of Laypersons' Attitudes Toward Organ Transplantation in Japan

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ABSTRACT

Background. In comparison with foreign countries, living-organ transplantations (LOT) have been performed more frequently than dead organ transplants, including brain-dead organ transplantation (BOT) in Japan. This situation has given rise to organ transplantation tourism. Therefore, we clarify laypersons' preferences regarding organ transplantation that are producing the current situation in Japan, to suggest a possible framework for further efforts.

Methods. Voluntary completion of a quantitative and anonymous survey was promoted online (a sample size of 1030). The questionnaire had two types of variables concerning demographic characteristics and organ transplantation–related issues.

Results. LOT was favored over BOT. However, for willingness to donate to family members, the participants showed a significantly more positive attitude toward brain-dead organ donors (BODs) than living organ donors (LODs). In the evaluation of each transplantation technology, BOT and LOT were positioned in the middle, between transplantation that does not depend on others and the utilization of animal organs.

Conclusions. Although LOT was favored over BOT, for participants hypothesized to be in a position to donate and receive organs, BODs received a conversely better reputation than LODs. Our survey and discussion suggest that the present conditions of organ transplantation in Japan might be because there is a lack of deliberation on transplantation tourism and LOT. Therefore, more surveys concerning LOT cases and the implications of avoidance of organs from brain-dead bodies, coupled with more discussions based on these surveys, are necessary to formulate a Japanese transplantation policy for the future.

COMPARED with other countries, especially Western European countries, Japan is biased regarding organ transplantation implementation. Living-organ transplantations (LOT) have been performed more frequently than dead organ transplants, including brain-dead organ transplantation (BOT). Observing the number of organ transplants in Japan, per million people in 2013 revealed that 14.23 LOTs had been performed, in contrast to 0.66 dead organ transplants. Contrasting the number of dead organ transplantations versus the number of LOTs per million people in other countries revealed 25.99 versus

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18.83 in the United States, 35.12 versus 8.59 in Spain, and 8.44 versus 36.54 in South Korea, another Asian country, which indicates that Japan possesses a higher proportion of LOT than other countries [1]. In Japan, LOT is the primary form of organ transplantation, despite Japanese legislation distinctly terming it "exceptional measures" [2]. Hence, because there are fewer BOTs in Japan, it is dependent on foreign countries for organ transplantation, especially for infant heart transplants.

This tendency can be traced back to Japan's unique organ transplantation history when the first BOT (Wada transplant) in 1968 became an immense scandal, influencing Japanese organ transplantation ever since [3]. However, given the extent of time that has passed since then, it is difficult to believe only one scandal is the cause for this bias. The Act on Organ Transplantation regulating BOTs came into effect in 1997. This law was revised in 2010, relaxing the agreement process in an attempt to increase the number of BOTs. Although the revision of the law certainly increased the number of BOTs, the total number of cadaver transplantations decreased considerably because the number of cardiac-arrest donations simultaneously declined [4]. Hence, Japan still depends on LOTs and organ transplants from foreign countries, including the United States [5].

Meanwhile, although Japan relies on LOTs, legal regulations concerning LOTs are insufficient. The 2010 amendment focused on the matter of brain death and consent methods but did not include legislation to regulate LOTs definitively, except with regard to the organ trade. Although various problems concerning LOTs have been reported [6–19], LOT is still conducted under insufficient regulations.

Thus, the state of organ transplantation in Japan, which significantly depends on LOT, has many problems both domestically and internationally in terms of having to rely on organ transplantation overseas. On the basis of the Istanbul Declaration [20], this situation cannot be neglected. Therefore, in this article, we clarify laypersons' preferences regarding organ transplantation that are producing the current situation in Japan to suggest a possible framework for further efforts. Japanese transplantation medicine, which is significantly dependent on LOTs as it is currently, indicates that this is not a social issue but a family issue [6]. On the basis of this hypothesis, this report aims to clarify the following: (1) whether the donor or recipient being a family member or not correlates with a layperson's organ transplantation preference, and (2) what is a Japanese layperson's fundamental standard preference or correlation factor that encompasses the preference trend in (1). In this report, we will primarily consider the preference between BOT and LOT, but, to clarify the more fundamental preference criteria of (2), we will also consider preference for future transplantation medicine such as human induced pluripotent stem cell (iPSC) organ transplantation.

METHODS

Survey Design and Study Sample

Voluntary completion of the quantitative, anonymous, and self-administered questionnaire survey was promoted online. For assistance with this, we commissioned a contracted market research company, Macromill, Inc, which has PrivacyMark certification [21]. We developed a study design and a web-based questionnaire. Then, we entrusted Macromill to: (1) create web pages for recruiting voluntary participants from Macromill's pre-registered anonymous research panels (for which the members' identities had already been removed); (2) to collect answers; and (3) to deliver to us the identity-free dataset with the answers. The potential participants were residents of Japan, capable of reading newspaper-level Japanese, and were categorized by age group (20s, 30s, […], 60s and up) and sex (male/female). The survey remained open to participants of each age group until the desired number (n = 103) of responses was collected for each group.

The questionnaire was designed to request replies after the participants had read an explanation of the study purpose and explanations of each transplantation technology, such as mechanical organ transplantation, xenotransplantation, and human iPSC-related organ transplantation, which distinguished between two organ types, those grown in a laboratory (iPSC-derived organs in the lab) and those from chimera animals (iPSC-derived organs in chimera).

Consequently, the anticipated sufficient number of responses was collected between February 25 to 26, 2014, and the total number of participants who completed the study was 1030 (the original number of respondents who expressed initial interest in answering questions on private matters after reading a 5- to 10-minute instruction was 1662). The sample size of each sex group was identical (male/female = 515/515). Spoiled replies were omitted, and only full answers were counted for analysis.

Variables

In addition to the variables on demographic characteristics shown in Table 1, the questionnaire had several variables on organ transplantation-related issues.

The main issues concerning organ transplantation were: (1) willingness to donate or receive organs from living organ donors (LODs) or brain-dead organ donors (BODs) and difference in willingness, depending on whether the donor or recipient being a family member or not; (2) individual self-perspectives on the degree of security, moral resistance, and future prospects for living, brain-dead, mechanical, xenotransplantation, transplantation of iPSC-derived organs in lab, and of iPSC-derived organs in chimera; (3) attitudes toward receiving or refusing organs from living, brain-dead, mechanical, xenotransplantation, iPSC in lab, and iPSC in chimera; and (4) understanding of organ transplantation from living, brain-dead, mechanical, xenotransplantation, iPSC-derived organs in the lab, and iPSC-derived organs in chimera.

Other issues related to organ transplantation were: (1) attitudes toward autopsies of family members, organ trading, use of corpses as medical resources, use of animals in medical research, donating body tissues for research, the fluctuation of identity due to transplanted organs, and artificial intervention in natural matters; (2) views on life and death, including brain death; (3) transplant-related experiences; (4) spousal opinion on brain-dead organ transplantation; (5) experience of bereavement and caring for family members over the past 5 years; (6) experience of engaging in social