

## Situation Surrounding Organ Transplantation: A Comparison Between Spain and Japan

Mayumi Kobayashi<sup>1</sup>, Joichi Usui<sup>2\*</sup> and Kunihiro Yamagata<sup>2</sup>

<sup>1</sup>Medical resident, Tokyo Women's Medical University, Shinjuku, Tokyo, Japan

<sup>2</sup>Department of Nephrology, Faculty of Medicine, University of Tsukuba, Tsukuba, Ibaraki, Japan

### Abstract

Organ transplantation in Japan, especially from deceased donors, has lagged behind that in other countries for many reasons. Even though the Japanese government approved the revised Organ Transplant Act in 2010, the number of donors remains small and the rate of donation from deceased persons was ranked 61st out of 62 countries registered in the International Registry in Organ Donation and Transplantation December 2014 (<http://www.irodat.org/>). On the other hand, Spain has become known as the world-leading country of organ transplantation and set a new world record with 4,360 transplants from 1,682 donors in 2014. The so-called Spanish Model has had a great impact on the development in transplantation in Spain. Here we mention the difference between Spain and our country, Japan, and also how we Japanese can increase donations and improve the situation in our country.

**Keywords:** Transplantation; Organ donation ; The Spanish model

### The History of Transplantation in Japan

In 2010, the Japanese government approved the revised Organ Transplant Act, which opened up the prior restrictions on deceased-donor organ donation. Contrary to expectations, however, the number of donors has remained small in subsequent years. The rate of donation from deceased persons in Japan was 0.66 Per Million Population (PMP) in 2013, giving it the ranking of 61st out of 62 countries that were registered in International Registry in Organ Donation and Transplantation. Japan has relied on living donor organs, but given the increasing numbers of patients who are waiting for transplantation and the necessity of self-sufficiency in transplantation proposed by the Declaration of Istanbul, we need to change the situation to promote registry for deceased organ donation.

The history of transplantation in Japan dates back to 1956. The first kidney transplant was performed in this year, followed by the first liver transplant in 1964 and the first heart transplant in 1968. However, the first heart transplant was criticized because of the selection of the recipient and the evaluation of brain death.

The first law related to transplantation, "Cornea and Kidney Transplantation Law", was established in 1980. Then, in 1997, the «Organ Transplant Law» took effect. It legalized the transplantation of organs from brain-dead donors but also had two big restrictions. First, the donations were allowed only when a donor had a written agreement prior to death. Second, it did prohibited donations from children younger than 15 years old. Due to these restrictions, it did not make a great impact on Japanese society. Finally in 2010, a revised Organ Transplant Act was approved, bringing many changes into Japanese transplant activities. It allowed organ procurement with only family consent and it also permitted donation by children younger than 15 years old. Also, it allowed priority donations to family members. Japan has been expected to make great progress with these developments. However, the present situation remains unsatisfactory. Through 2009, the number of brain-dead donors was almost 10 per year, but the new law brought this number to almost 50. On the other hand, the number of cardiac death donors was 100 through 2009, but has been declining year by year to almost 40 in 2013 according to the data published by the Japan Organ Transplant Network. The number of patients on the transplant waiting list continues to increase; hence, it is essential to explore ways to meet patient demand in our country

### Spain as a Leading Country of Transplantation

Spain has been known as the world-leading country of organ transplantation. In 2014, Spain set a new world record with 4,360 transplants from 1,682 donors, with the rate of donation from deceased persons of 36 pmp according to the data of the International Registry in Organ Donation and Transplantation (<http://www.irodat.org/>). The rates of organ transplants from deceased donors in Spain were 48.21 pmp for kidney, 22.53 pmp for liver, 5.70 pmp for heart, and 5.60 pmp for lung whereas those of Japan were 1.22, 0.31, 0.3 and 0.32 pmp for kidney, liver, heart and lung, respectively. Even though the rate of donation in Spain was only 14 pmp in Spain in 1989 [1], dedicated efforts have greatly improved the situation. The so-called Spanish Model is seen as the key to the improvement of transplantation in Spain. Also, the Spanish Model has brought success in other countries such as Croatia, Portugal and the region of Tuscany, in Northern Italy, by applying the model to each country's situation. These countries hold a high donation rate, recording the donation rate of 35 pmp in Croatia, holding the second place in the world following Spain according to the previously mentioned data.

### The Spanish Model

The first legislation of organ transplantation in Spain was established in 1979, and in 1989, the Organización Nacional De Trasplantes (ONT), as the national transplant organization in Spain, was established with the aim to promote transplantation. Even though the rate of donation from deceased persons in 1989 was 14 pmp, ranking the country at the mid-low position compared with other European countries, the so-called Spanish Model introduced by ONT drastically changed the situation of transplantation in Spain.

**\*Corresponding author:** Joichi Usui, Department of Nephrology, Faculty of Medicine, University of Tsukuba, Tsukuba, Ibaraki, Japan, Tel: +81-29-853-3202; E-mail: [j-usui@md.tsukuba.ac.jp](mailto:j-usui@md.tsukuba.ac.jp)

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The Spanish Model consists of eight main elements [2-6].

1. Three levels of transplant coordination system: national, regional and hospital
2. A requirement that transplant coordinators be medical doctors, especially intensivists
3. A central office of transplantation supporting all processes associated with transplantation
4. Quality assurance in the process of organ donation
5. Continuing effort to conduct a well-programmed training course for transplant coordinators
6. Financial support for both organ procurement and transplantation hospitals
7. Dedication to mass media publicity campaign
8. Adequate legislation including a definition of the brain death and the conditions for organ extraction

## Discussion

Can we apply the Spanish model to Japanese society?

According to the public poll performed in Japan in 2013, more than 40% people replied that they want to donate their organs. However, these numbers are not reflected in the actual situation. How can we increase donations? Can we apply the Spanish Model to Japanese society? Adoption of the Spanish Model has also improved the situation for transplantation in countries such as Croatia, Portugal and the region of Tuscany in Northern Italy [2]. To follow the precedent, we need to find a way not just to apply the Spanish Model but to adapt it to Japanese society, of these eight elements of the Spanish Model, we can identify four points that should be a focus in our country:

1. Increase the number of hospital transplant coordinators
2. Provide a training course for transplant coordinators
3. Provide financial support for hospitals in the donation and transplantation process, and 4. Cooperate with the mass media.

### Increase the number of hospital transplant coordinators

In Japan, there are recipient Transplant Coordinators (TCs), mostly nurses, and donor TCs. Donor TCs include:

- TCs in Japan Organ Transplant Network (JOT): 34 (11 nurses, 6 medical examiners, 1 medical engineer, 1 pharmacist, 1 emergency paramedic and others)
- Prefectural TCs: 54 (29 nurses, 6 medical examiners or engineers, 3 pharmacologists and others)
- Hospital TCs: about 1800 (physicians 18%, nurses 66%, and others) [7].

Compared to the recommendation in the Spanish Model, the absolute number of transplant coordinators is small and the number of transplant coordinators who have training as medical doctors is insufficient. Transplant coordinators who have nursing or other medical professional background clearly play a great role in Japan; however, to increase the number of donations, it is very important to detect and evaluate possible donors prior to brain death. Medical doctors, who can precisely grasp and prognosticate patients' conditions, are in a better position to coordinate transplantation in each hospital. To detect possible donors is the very first

step in the process of donation and it also makes the most of donated organs by realizing transplantation in a shorter time.

### Training course for transplant coordinators

JOT and prefectural TCs organize a few hours of seminars for hospital TCs. Also, JOT TCs and the prefectural TCs conduct classroom lectures not only for TCs but also for other medical staff including physicians, nurses, medical engineers, and medical examiners in each donor hospital. The topics are the Japanese legislation of transplantation, the current status and the process of organ donation including the roles of medical staff. However, seminars are held only 2 or 3 times per year and so there are not many opportunities to educate transplant coordinators in Japan [8]. According to the questionnaire provided by Konaka et al. [9], 77% of hospital TCs have participated in seminars but 93% of hospital TCs want more professional education [9].

Transplant coordinators hold the key to increasing donation and organizing the whole process of transplantation. According to the Spanish opinion poll offered in 2007, 66.5 % of Spanish people are willing to donate their organs, meaning that only one in three people have a negative feeling toward donation. However, the actual refusal rate is about 15%, while that of the 1990s was 30% [4]. Here I should mention the interesting data on British expatriates living in Spain. In the United Kingdom, the family refusal rate was about 40%, but in Spain, there were more than 100 British patients who came to the hospital with brain death, and all said yes to the donation. The family refusal rate of British in Spain was ultimately zero according to the report "Increasing the Supply of Donor Organs Within the European Union: 17th Report of Session 2007-08" published by the Authority of the House of Lords. These episodes show that transplant coordinators are the ones that make the difference.

It is sometimes said that the protocols known as "Opt-in" and "Opt-out" are the main factors in the difference of donation rates, but actually this is not a big issue. Moreover, Spain is said to be Opt-out country (you must inform authorities if you wish to opt out), contrary to the Opt-in policy in Japan, but in the real clinical situation, family members are always asked about their wills in terms of donation. In addition, a donor card is one good way to attract public attention to donation, but it is not greatly linked to increase donation. What is important to improve the situation is not the presumed consent but the dedicated effort of transplant coordinators to both support family members in their time of crisis and discuss organ donation with them.

### Financial support for hospitals in the donation and transplantation process

In Japan, transplantation activity (except intestinal transplantation) is included in medical remuneration. According to the protocol of Japan Organ Transplant Network, organ donor hospitals are reimbursed via JOT the following three fees originating from transplant hospitals:

- 1) An organ donation management fee,
- 2) the transplant organ removal operation fee and
- 3) the organ removal instrument set fee

**Organ donation management fee:** Transplant hospitals pay 200,000 yen (about 1,680 USD; 1 JPY = 0.008401 USD based on exchange rate of September 5, 2015) for each organ, and donor hospitals are reimbursed 810,000 yen (about 6,800 USD). In addition, if the cardiorespiratory doctor comes from another hospital, 60,000 yen (about 500 USD) is paid to the hospital that sends that doctor.

**The transplant organ removal operation fee:** When transplantation is performed, organ donor hospitals are reimbursed depending on each organ. For example, for heart 282,600 yen (about 2,370 USD), liver 390,500 (about 3,280 USD), simultaneous pancreas and kidneys or kidney 559,400 yen (about 4,700 USD).

**The organ removal instrument set fee:** If donor hospitals offer abdominal surgery or thoracic surgery, 40,000 yen (about 340 USD) is reimbursed for each.

In addition to these three fees, travel expenses for doctors who are sent from other hospitals to support the diagnosis of brain death in donor hospitals are paid by JOT. These reimbursements have been improved along with the revision of medical remuneration in 2012, but considering that the donation process owes a lot to donor hospitals, the Japanese government should seek more ways to support them.

Also, even though the donation and transplant process are included in medical remuneration, the diagnosis of brain death just for itself is not guaranteed by medical remuneration [10]. It necessitates professional diagnostic skill to diagnose brain death, but not all clinical brain death cases can be applied to donations. In that situation, medical professionals are not willing to spare much time and effort to diagnose brain death. For these reasons, diagnosing brain death should be covered by insurance not only to increase the possibility of donation but also to offer more options for patients and their families.

Finally, related to the insufficient number of transplant coordinators as mentioned above, the Japanese government should also create a budget for placing more transplant coordinators in more hospitals.

### Co-operation with mass media

In Spain, news on transplantation is reported on TV programs and newspapers almost every day. Even on Internet news, there is a special page for transplantation. These reports keep the general public interested in donation or transplantation, and the topic often comes up in daily conversation, offering many opportunities to think about these issues. This exposure causes Spanish people to consider organ donation a normal act in a daily life. Also, these positive news items make Spanish people very proud of themselves as a world-leading country

of transplantation. By contrast, in Japan, transplant activities are not generally covered by the mass media to educate the general public. The following data shows the effectiveness of mass media to enlighten the general public.

A survey of public opinion on transplantation by the Japan Ministry of Health, Labour and Welfare, performed in August, 2013, and found that 57.8% think that organ transplantation is an interesting news topic while 42.2% did not. Among the 52.7% who were interested, their reasons were as follows (multiple answers): Influence of TV or Radio 62.6%, influence of newspapers or magazines 45.8%, influence of health insurance card and driver's license card 26.5%. These results also show that mass media have great influence on the general public and are an effective tool for educating the general public.

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