

## Editorial



# Understanding the Current Status of Korean Heart Transplantation Based on Initial KOTRY Report

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### Conflict of Interest

The authors have no financial conflicts of  
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### Author Contributions

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► See the article “Initial Report of the Korean Organ Transplant Registry (KOTRY): Heart Transplantation” in volume 47 on page 868.

The first heart transplantation (HTPL) in Korea took place at Asan Medical Center in 1992, and more than 1,300 of these same procedures have been performed in the country through August 2017.<sup>1)</sup> The number of annual HTPLs was low before 2000, with less than 20 occurring each year. However, this number has since increased to more than 50 between 2000 and 2007 and now exceeds 140 annually.<sup>1)</sup> Lee et al.<sup>2)</sup> first reported data from the Korean Organ Transplant Registry (KOTRY) regarding HTPLs; KOTRY for HTPL was started by the Korean Society for Transplantation and the Korean Center for Disease Control in 2013. The data were collected from 4 nationally representative hospitals; 183 HTPLs that took place from April 2014 to December 2015 were included. This monumental report allows for a better understanding of the current status of HTPL in Korea and also will contribute to future investigational research as well as the development of adequate HTPL related policies for patient care. Therefore, the quality of end-stage heart failure (HF) management via HTPL should improve.

The number of HF patients in Korea is steadily growing, and their age and combined comorbidities are also increasing.<sup>3)</sup> This phenomenon has likely resulted from demographic changes and the fact that more patients survive initial serious cardiovascular events, such as acute myocardial infarction or acute decompensated HF, due to the advent of various treatment modalities. Consequently, the number of end-stage HF patients is increasing. Among the currently available end-stage HF management strategies, HTPL is considered the fundamental treatment option to improve quality of life as well as overall survival. Globally, recent heart transplant recipients tend to be older and have more co-morbidities than their historical counterparts.<sup>1)4-6)</sup> Therefore, HF specialists must expect more time and effort to be required with HTPL patients to produce a better clinical outcome. With the advancement of pre- and post-transplantation management and improved surgical techniques, the indications for HTPL listing and donor selection have broadened, leading to an increased number of HTPLs. Nevertheless, donor shortage is still a major barrier worldwide.<sup>3)5)6)</sup>

With its 25-year history, Korean HTPL has established a good survival rate of 91.6% at 1-year postoperatively based on the initial KOTRY report.<sup>2)</sup> We also identified features unique to Korean end-stage HF management when compared with the International Society for Heart and Lung Transplantation (ISHLT) registry and a Japanese HTPL registry.<sup>5)6)</sup> The ISHLT and

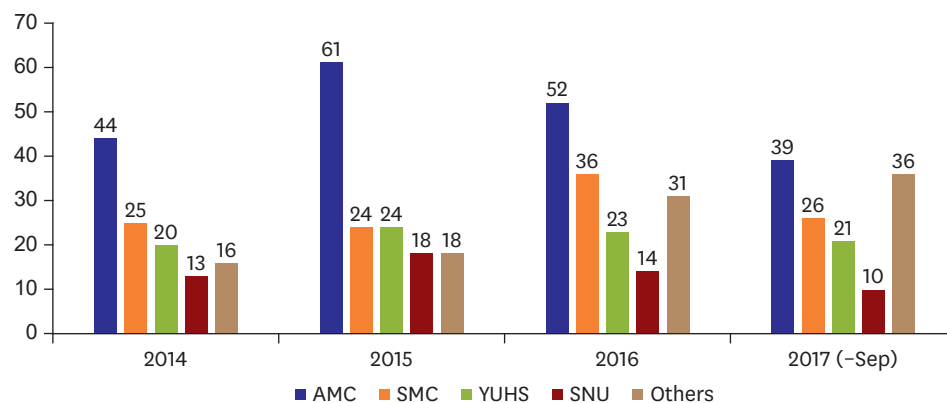
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Japan report HTPL summary data annually, which allowed us to compare their results with KOTRY data (**Table 1**). The major difference was the utilization of mechanical circulatory support; the usage rates were 0% in Korea, 42.9% by the ISHLT and 60.5% in Japan. Due to limitations in the current reimbursement system, Korean physicians rarely use long-term, durable ventricular assist devices (VADs) before HTPL. In contrast, HTPL during inotropic support is the most common strategy in Korea (Korea: 93%, ISHLT: 39.8%, and Japan: 5%). While the 1-year survival rate in Korea (91.6%) was higher than that reported by the ISHLT registry (85.0%), the Japanese registry revealed remarkably excellent survival rates (1-year survival: 98%, 5-year survival: 92.7%), which was probably due to their country's specific donor evaluation method (a 2-stage screening process for registration) and strict HTPL management system, where HTPLs are only permitted at authorized institutions.<sup>3)7)</sup>

Until now, just 4 major centers in Korea have performed most HTPL cases, opening a new chapter for end-stage HF management. With the increased incidence of HF, interest in HTPL has grown in Korea, resulting in an increased number of HTPLs being performed at other institutions (**Figure 1**). We hope that the Korean HTPL registry will become more nationally representative by including all cardiac transplant patients in the near future and will be a driving force to further raise the performance of domestic HTPL.

To improve the quality of end-stage heart failure management (including HTPL) in Korea, the following efforts need to be emphasized. First, an effective donor detection and organ-



**Figure 1.** Annual numbers of HTPLs performed in Korean hospitals. AMC = Asan Medical Center; HTPL = heart transplantation; SMC = Samsung Medical Center; SNU = Seoul National University; YUHS = Yonsei University Health System.

**Table 1.** A comparison of the KOTRY with the representative ISHLT HTPL registry and a Japanese HTPL registry

	KOTRY (183 patients; Apr. 2014–Dec. 2015)	ISHLT (30,503 patients; Jan. 2009–Jun. 2016)	Japan (284 patients; Feb. 1999–Jun. 2016)
Number of HTPLs (annually, /year)	131.5 (2014–2015)	≈2,500	33.3 (2010–2015)
Mean donor age (years)	37.6	35.0	NA
Mean recipient age (years)	50.5	55.0	38.1
Male	67.2%	75.0%	74.0%
Underlying diseases (DCM/ICM)	69%/14%	50%/34%	66%/8%
Inotropic support	93%	40%	5% (2010–2015)
ECMO	19%	1%	34% (2010–2015)
Long-term VAD	0%	43%	61% (2010–2015)
One-year survival rate	91.6%	85.0%	98.0%

Values are presented as number or percentage.

DCM = dilated cardiomyopathy; ECMO = extracorporeal membrane oxygenator; HTPL = heart transplantation; ICM = ischemic cardiomyopathy; ISHLT = International Society for Heart and Lung Transplantation; KOTRY = Korean Organ Transplant Registry; NA = not available; VAD = ventricular assist device.

sharing program with adequate listing criteria needs to be developed. Second, delicate donor and recipient management strategies regarding various expected or unexpected situations associated with HTPL should be introduced.<sup>8)-10)</sup> Third, Korean guidelines for HTPL that will standardize the pre- HTPL evaluation process and post-operative management protocol must be established. A well-organized nationwide HTPL registry would play a fundamental role in creating an optimal healthcare system for end-stage HF patients in Korea.

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