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Session Title : Old age in kidney transplantation

Outcomes of kidney transplantation using old donors

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1. Elderly donors in Living donor kidney transplantation

The appropriate age of donors in Japan's guidelines for living donor renal transplantation (LDKT) is 20 to 70 years old; therefore, we define elderly donors as those over 70 years old. In 2019, before the COVID19 epidemic, 1827 cases of LDKT were performed in Japan. The mean age of donors in 1827 cases was 58.8 years (20-86 years) and 15.9% of donors were over 70 years old; in 2014, the mean age of donors was 56.9 years and the percentage of donors over 70 years was 11.2%, suggesting an increasing elderly donor population. The age of induction of dialysis due to diabetic nephropathy is also considered to be the reason for this trend, as well as the increase in transplants between unrelated spouses (from 36.1% in 2014 to 40% in 2019). Previous studies have found that LDKT in donors over 70 years of age is a risk factor for graft loss compared to LDKT in donors 50-59 years of age. (J.C. Berger, Clin J Am Soc Nephrol, 6 (2011)). In Japan, Hiramatsu et.al reported that in a study of 853 renal transplant patients, KT of elderly donors and elderly recipients had the highest graft loss risk and mortality. The eGFR after KT was significantly lower in donors aged 70 to 89 years than eGFR from other groups of donors. However, the 5-year graft survival was relatively good at 84.2%, suggesting that kidney transplantation from elderly donors is acceptable when the quality of life of elderly recipients is considered. (Kidney Int Rep. 2021 Oct 14;6(12):3026-3034.). Regarding the prognosis of elderly donors, a large cohort study of approximately 80,000 living donors conducted in the United States between 1994 and 2009 reported long-term mortality in elderly living donors. The mortality rate 12 years after donation was 1.5% for living donors and 2.9% for the control group, which was the general population, and the mortality rate was significantly lower (Segev DL et al. Perioperative mortality and long-term survival following live kidney donation. JAMA 2010). In a similar cohort study, the 10-year survival rate for 219 elderly donors aged 70 years or older was 90.0%, whereas the 10-year survival rate for 219 age-matched donors in the general population was 73.0% (Berger JC, et al. Living kidney donors ages 70 and older: recipient and donor outcomes. Clin J Am Soc Nephrol 2011). These results indicate that the mortality

rate of elderly living donors is not higher than that of the general population of the same age.

2. Elderly Donors in Deceased donor Kidney Transplantation

In Japan, only 230 people (1.8% of the 12,000 patients on the waiting list) received deceased donor kidney transplants (DDKT) in 2019. Of the 3438 donated kidney donors in Japan from 1995 to 2015, 26.8% were over 60 years old, 80% were cardiac arrest donors, and 54.9% had cerebrovascular disease as the cause of death. In Japan, DDKT from so-called expanded criteria donors has also been performed. On the other hand, of 1020 donor kidney transplants performed between 2010 and 2017 in Japan, the 1-year and 5-year graft survival rate was 96.4% and 87.9%, showing good long-term results. However, elderly donors (70 years of age or older) had a clearly lower graft survival rate than donors aged 30 to 39 years (HR 2.47, $p < 0.001$). Furthermore, 239 (6.8%) of 3262 donor kidney transplants did not regain renal function, and risk factors for PNF included donation under cardiac arrest, donor age (< 70 years), HbA1c ($6.5\% <$), WIT ($30 <$), TIT ($24 \text{ hr} <$). Renal transplantation from donors older than 70 years of age is a high-risk procedure and should be performed after sufficient informed consent.