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Effect of donor and recipient size mismatching on the survival of the transplanted kidney in pediatric kidney transplant patients

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Background Kidneys from adult donors, rather than age- and size-matched pediatric donors, are utilized in most pediatric recipients, making donor-recipient size mismatch a common problem in pediatric kidney transplantation. This size mismatch can lead to various medical problems, such as hemodynamic imbalance, graft hypoperfusion, increased cardiac burden, challenging surgical approach, and poorer graft outcome. Although there have been studies directly comparing graft survival and outcomes in children receiving kidneys from adult versus pediatric donors, there are no exact answers yet.

Methods 241 pediatric patients who received kidney transplants and followed up for more than 1 year were enrolled from three major university hospitals in Korea. Their medical records and registration data of KONOS were analyzed to evaluate the size mismatching based on the ratio of weight and body surface area (BSA) of donors and recipients and compare the survival rate of transplant kidney according to the degree of size mismatching.

Results The mean age of pediatric recipients was 11.7 years, with boys accounting for 61.8% of the total. The main cause of their ESKD was CAKUT, accounting for 42.1% of the total. The average weight at the time of transplant surgery of the recipients was 34.3 kg and the mean BSA was 1.12 m². Their follow-up period after kidney transplantation was 8.06 years (96.5 months). The mean age of donors was 34.7 years, with living-related accounting for 81.7% of the total donors. In living-related donors, the rate of recipients' mother was 59.7%. The average weight and BSA of the donors was 56.5 kg and 1.56 m². The average weight of transplant kidneys was 153 g. Donor-recipient body weight ratio (DRBWR) and eGFR showed a significant positive correlation immediately and at the first year after transplantation, but this correlation could not be confirmed at the last follow-up periods. These results were same in the comparison between donor-recipient body surface area ratio (DRBSR) and eGFR. On the other hand, there was no significant correlation between DRBWR or DRBSR and development of DGF. In addition, there was no significant difference in the long-term survival rate of graft according to DRBWR and DRBSR.

Conclusion Donor-recipient size mismatch that commonly occurs in pediatric kidney transplants is not a risk factor that reduced long-term survival rate of transplant kidneys.