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INVITED COMMENTARY

One more time, emphasizing the advantage of simultaneous pancreas and kidney transplantation for patients with type 1 diabetes and end-stage renal disease

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Introduction

Simultaneous pancreas and kidney (SPK) transplantation is considered the best treatment option for patients with diabetes and end-stage renal disease (ESRD). SPK recipients with a functioning pancreas graft have significantly better kidney graft survival and patient survival compared to those who received a kidney-only transplant or those with a failed pancreas graft [1–3]. In addition, SPK recipients with isolated pancreas graft failure who undergo pancreas retransplant still have better kidney graft survival [4]. SPK recipients also have better quality of life compared to kidney-only recipients or those not receiving any transplant among patients with type 1 diabetes and ESRD [5,6]. With advances in immunosuppression, surgical technique, and proper selection of recipients, pancreas graft survival has increased significantly in the current era, with a pancreas graft half-life in SPK recipients currently of more than 14 years [7]. Given all these previous studies, there is little doubt that among suitable recipients, SPK is associated with better patient survival, kidney graft survival, and quality of life, and should be considered an optimal treatment option.

The article published by Shingde *et al.* [8] in this issue of *Transplant International* is the latest and perhaps the first using the Australian and New Zealand Dialysis and Transplant Registry (ANZDATA) in the current era. In this study of 299 patients with type 1 diabetes and ESRD, 179 underwent SPK transplants, 47 received deceased donor kidney-only transplant and 73 remained on the dialysis. The majority of SPK recipients were young and only 9 SPK recipients were between 50 and 53 years. Pancreas after kidney (PAK) or pancreas transplant alone (PTA) were excluded. After creating a probabilistic Markov model, with a hypothetical cohort sample size of 10 000 patients, the cohort was divided into five different arms which we encounter in clinical practice, based on those who remained on dialysis, those who received deceased donor kidney in different age groups and those who received SPK transplants. Compared to dialysis, the average life years saved (LYS) and quality-adjusted life years (QALY) were significantly better for SPK [HR: 5.48; 95% CI: 5.47–5.49] LYS and

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[HR:6.48; 95% CI: 6.47–6.49] QALY. Not only that, even among some recipients who did not qualify for SPK but just received deceased donor kidney-only transplant, had some advantage, which was half-way between SPK and being on dialysis [HR:3.38; 95% CI: 3.36–3.40] LYS and [HR: 2.46; 95% CI: 2.45–2.47] QALY. Based on these findings, the authors concluded that SPK incurs the greatest gain followed by a deceased donor kidney-only transplantation among patients with type 1 diabetes and ESRD even in this era with better management of diabetes.

Despite significant improvements in the graft and patient survival, there has been a decline in the number of SPK transplants. From 2004 to 2011, the annual number of SPK transplants in the United States declined by 10% [9]. The findings of this current study re-emphasize the importance of SPK transplantation among suitable recipients and may reassure primary referral sources and the diabetes care community regarding early referral, which has been an important factor in the decline in SPK transplantation [9].

What is missing:

Based on the various previous studies, the benefits of SPK transplantation among suitable patients with type 1 diabetes and ESRD are no longer the subject of much controversy. There has been speculation for many years that the combination of continuous glucose monitoring combined with continuous insulin infusions, the so-called "artificial pancreas," might someday make pancreas transplantation obsolete [10], but the data on benefits of SPK compared to kidney transplantation alone demonstrate that day has not yet arrived. The main debate in this field is the choice between SPK and PAK, especially if a potential recipient has a living kidney donor. In a recent single-center study of 24 PAK compared to 611 SPK recipients, similar graft survival of both grafts were observed, indicating that PAK can be a good alternative [11]. In this current registry data from ANZDATA [8], the wait time to receive SPK was not too long, averaging 1 year. However, this may not be the case in some parts of the world, where wait times to receive an SPK are significantly longer. In that scenario, and with the availability of a living kidney donor, do PAK recipients still accrue similar increments in life expectancy and quality of life? These questions remained unanswered.

Historically, pancreas transplantation was uncommon among recipients more than 50 or 55 years of age. This practice is changing and in 2016, in the United States, one of four (24.5%) pancreas recipients was over 50 at the time of transplant and had similar patient survival compared to the younger recipients, although there were more cardiovascular events in the older recipients [12,13]. Can similar findings of life expectancy or quality of life gain be anticipated in older SPK recipients? Also, the practice of SPK transplantation is changing in this era- SPK in patients with type II diabetes, higher body mass index, ethnic diversity, or previous transplants are now not uncommon. However, we are still uncertain about the graded advantage of SPK transplants in these types of recipients compared to receiving deceased donor kidney-only transplant or being on dialysis. However, this current study emphasizes the benefits of SPK transplants in areas with relatively short waiting times and hopefully will reassure these patients and their healthcare providers.

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Conflicts of interest

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