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LETTER TO THE EDITORS

Kidney transplantation after previous hematopoietic stem cell transplant: need of immunosuppressive treatment?

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Dear Sirs,

In 1983, a 17-year-old man developed idiopathic aplastic anemia. He underwent HLA-identical hematopoietic stem cell transplantation (HSCT) from his sister (HLA; A 03-33, B 14-62, DR 01-13, DQ 05-06). The conditioning regimen consisted in cyclophosphamide and thoraco-abdominal irradiation radiotherapy. GvHD prophylaxis was cyclosporine alone, and steroids were given for acute GvHD treatment; both were withdrawn 18 and 29 months post-transplantation, respectively.

In 2007, living donor KT with the same sister was performed for end-stage renal disease (ESRD) secondary to chronic nephroangiosclerosis. Hematologic 100% donor chimerism was confirmed by chromosomal fluorescent in situ hybridization. Induction therapy was methylprednisolone 500 mg on day 0. Prednisone was administered thereafter and discontinued on day 10. No supplementary immunosuppressive therapy was given. Immediate recovery of renal function was observed: serum creatinine was 98 μmol/l at day 10, remained stable the following month, and was 80 μmol/l at 86 months with no proteinuria or anti-HLA antibodies detected.

Over the two last decades, HSCT has become the standard treatment for many hematologic diseases, solid tumors, and immune disorders [1]. The incidence of chronic kidney disease after HSCT is increasing due to improved patient survival, but ESRD occurs in less than 1% [2]. In 1991, Sayegh *et al.* [3] described the first two patients whom underwent a KT for treatment of ESRD from their related HLA-identical HSCT donor. Immunosuppressive therapy consisted in short-term steroids only. They observed excellent short-term results: serum creatinine was 106 and 62 μmol/l without episode of rejection or death. The 10 others cases report including ours found similar results for kidney function and graft survival (Table 1) [4–6].

Kidney transplantation from the same haploidentical donor after previous HSCT is also possible. Recently, Fangmann *et al.* [7] reported the case of a patient with living KT 2 years after previous haploidentical HSCT for acute myeloid leukemia. Immunosuppressive treatments were progressively withdrawn: steroids and tacrolimus were stopped at 1 month and mycophenolate mofetil on day 100. Five others cases were described in the literature and three with transitory immunosuppressive agent [4,6,8,9]. Short-term results for renal function were very interesting after KT after previous HSCT from the same donor, 89 μmol/l (62–142) at the last follow-up without episode of rejection [3–9] (Table 1).

A corner stone is the possibility to perform KT with the same donor than the HSCT. This experience is not unique to the kidney and has been reported in other solid organ transplantation (e.g., liver and lung) [5]. Indeed, hematopoietic chimerism occurred when hematopoietic cells from donor are present in recipient, induced a state of tolerance. In this situation, no immunosuppressive treatment may be required for renal or other solid organ transplant [5].

In contrast, KT from a different donor than the HSCT required "classic" immunosuppressive regiment to avoid rejection [4,6,10]. This treatment may increase the risk of infection or malignancy (Table 1). Indeed, severe infectious diseases were a main problem in KT recipient after HSCT, 15% in our review (n = 4/27). This probably reflects long-lasting immunodeficiency [11]. In the literature, we observe 2/27 death secondary to metastatic vagina carcinoma and PTLD. Some of the cancers after HSCT may be related to the use of irradiation in the conditioning regimen or previous therapy for leukemia [11].

In summary, HSCT patients (i) can benefit from a KT with good results on graft survival (Table 1), (ii) must underwent a transplantation whenever possible with the same HSCT living donor with transient immunosuppressive treatment or even no treatment at all because excellent short-term graft function and high risk of opportunistic infection and malignancy in this population (Table 1), and (iii) need lifelong medical surveillance.

Table 1. Characteristics of recipient with kidney transplantation after previous hematopoietic stem cell transplant [3–10].

	HSCT and kidney from same donor (n = 18)	HSCT and kidney from different donor (n = 9)
Patient HSCT age	24 (7–52)	39 (2–50)
Male/Female	8/10	7/2
Primary disease		
Acute myeloid disease	7	1
Acute lymphoid disease	3	1
Chronic myeloid disease	2	1
Aplastic anemia	3	
Lymphoma	1	
Acute nonlymphocytic leukemia	2	2
Neuroblastoma		1
Other		1
Donor		
Alloidentical	12	1
Haploidentical	5	1
1 DR mismatch donor	1	1
3 MM		1
More than 3 MM		3
Unknown		2
Time (year)	3 (1–24)	7 (1–10)
Immunosuppressive treatment after kidney transplantation		
No medication	4 (22%)	
Short-term steroids	6 (33%)	
Low-dose steroids	2 (11%)	
Immunosuppressive regiment	6 (33%)*	9 (100%)
Last follow-up after kidney transplantation (month)	30.5 (1–80)	30 (10–105)
Last follow-up serum creatinine (μmol/L)	89 (62–142)	88 (53–310)
Death	2 (11%)	3 (33%)

HSCT, hematopoietic stem cell transplant; MM, mismatch.
*Immunosuppressive treatment was discontinued in four patients, respectively, on day 56, 100, at 1 year, and 3 years.

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Conflict of interest

The authors have no conflict of interests to declare.

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