Table 1 Effect of HLA-DR antigen matching on transplant survival

HLA-DR Mismatches	Number of cases	% Acturial transplant survival[15] 1 year	5 years	10 years
Zero	422	85.4	72.1	66.1
One	438	79.8	64.0	51.8
Two	140	67.8	52.8	40.4

One thousand consecutive first cadaver donor kidney transplants performed in Manchester, UK 1979 to June 1992.
$p < 0.00005$.

also shown that when transplants are mismatched, recipients produce antibodies directed to the mismatched HLA specificity and even with sophisticated immunosuppressive drug therapy such antibody production is associated with transplant failure[5,6]. When repeat transplantation is needed such antibody formation seriously reduces the chance of finding a suitable donor.

Centres advocating allocation of organs to recipients on the basis of least HLA mismatch cite studies showing that transplant survival is significantly improved in cases where a high degree of HLA matching is achieved over cases where there is little or no HLA match[7]. In our own centre (see Table 1) where allocation of cadaver kidneys has always been based on HLA matching, we find that those which had no mismatches for HLA-DR specificities have a transplant survival of 85.4% after one year. This is 17.6% higher than complete (two) HLA-DR mismatched transplants. The remaining cases with one HLA-DR mismatch show intermediate survival. Highly significant improvements in graft survival (up to 10 years post transplantation) have also been observed for HLA-DR matched donor–recipient pairs (Fig. 1).

Allocating organs

No one disputes that the degree with which a donated organ matches the HLA status of the recipient is relevant to the well being of both the donated organ and the patient. However, it is a mystery how different countries can have evolved such divergent HLA matching practices. By way of advancing the discussion, two contrasting views on the practice of HLA matching are presented (pages 210 to 213). Matas makes the case for only a limited recognition of the HLA match between donor and recipient (broadly the practice in the U.S.), whereas Martin and Dyer (representing a European point of view) argue that HLA matching is the most important factor to be considered. **A.J.I.**

Matching — a valuable resource

Arguments against selection of organ recipients based on HLA matching protocols centre on the difficulty of achieving a match due to the highly polymorphic nature of the MHC; over 150 alleles of HLA-A, -B, -C and -DR genes exist and HLA alleles can be population specific, or at least of unequal distribution between different ethnic groups. This has precipitated considerable debate in the United States where most cadaver organ donors are of caucasoid origin. It has to be remembered that the number of cadaveric organs available for transplantation has stabilized, world wide, at approximately 20 per million population per year. Organ donation at this rate will never meet recipient demand. In such a situation, it is essential to maximise the efficiency of ▶

better outcome in living related donor (versus cadaver) transplants and outcome is better in well-matched (versus poorly matched) cadaver transplants. These arguments need detailed analysis. Although living related donor transplants do have better outcomes than cadaver transplants, the reason may not be better histocompatibility matching. In fact, other than the perfectly matched living related donor (2 antigens matched at each of HLA-A, -B and -DR), no evidence exists that matching has any impact on the outcome of living donor transplants; 1-haplotype (3 antigens) and 0-haplotype (0 antigens) matched living related donor transplants do equally well[3]. More importantly, living unrelated donor transplants — which are no better histocompatibity matched than cadaver transplants — have outcomes similar to living related donor transplants[4,5]. With a living donor (unrelated or related) initial graft function is excellent and patient care much easier. It may be that this early function is the cause of the better outcome. The prognosis is similarly good in the subgroup of cadaver kidneys with excellent initial function (irrespective of matching)[6].

In the United States, the impact of matching on cadaver transplant outcome is small (Fig. 1). It has been shown clearly that perfectly matched (6-antigen-match) trans-plants have better outcome[1], and current policy mandates the national sharing of such kidneys. But there is little evidence to support giving priority to histocompatibility matching for other kidneys. In a multifactorial analysis of 35,625 kidney transplants reported to the UNOS transplant registry between 1988 and 1991 (ref. 7), the dominant factor influencing outcome was the centre where the transplant was done. Matching did affect outcome but the impact was small: at 3 months post-transplant, graft survival for organs with 1 mismatch at HLA-A or -B was 88.5%; 2 mismatches, 87.1%; 3 mismatches, 86.1%; and 4 mismatches, 85%. 3-month survival for 1 HLA-DR mismatch was 86.9% and for 2 DR mismatches was 85.7%. Because of the large numbers in each subgroup, these differences — though minor — are statistically significant. The subsequent impact of matching was also studied. For recipients whose grafts functioned at 3 months, 12-month survival for 1 mismatch at HLA-A or -B was 94.2%; for 2 mismatches, 92.9%; for 3 mismatches, 92.1%; and for 4 mismatches, 92%. DR matching was not found to be a long-term factor in graft survival[8-10]. In a review of the United States Renal Data System (17,913 cadaver and 7,061 living donor transplants), the maximum possible impact of an allocation system based on matching was a 3% change in 5-year graft survival[10]. Our data (1,329 cadaver transplants) show that HLA matching has no impact on short-term graft survival, long-term graft survival or ▶