Relationship between donor factors, immunogenic up-regulation, and outcome after kidney transplantation

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Epidemiological data show that the cause of brain death as well as the condition of the organ donor have considerable influence on the outcome of kidney transplantation. An early immunogenic up-regulation, which already exists at the time of organ removal, seems to be primarily responsible. So far it has remained unclear which donor factors cause this effect. In a prospective study of 37 organ donors, a 0-hour biopsy was performed at the time of explantation to measure the expression of HLA-DR and endothelin-1 (ET-1) immunohistologically using the alkaline phosphatase anti-alkaline phosphatase (APAAP) method. The transplant outcome and the immunohistological results were correlated with various donor factors. Statistically significant correlations were seen with the following parameters: the donor serum creatinine prior to explantation correlated with the incidence of delayed graft function (DGF: 104 +/- 39 vs 78 +/- 35 micromol/L versus no DGF, n = 37; P = .043). Early graft loss after transplantation correlated significantly with increased numbers of leukocytes as well as with decreased O2 saturation in the donor immediately before explantation (leucocytes: 16.7 +/- 6.8 vs 12.6 +/- 4.6/nL, n = 37; P = .036; O2 saturation: 94.1% +/- 6.9%, vs 97.7% +/- 2.3%, n = 37; P = .026). Further, donor-independent factors that correlated with acute rejections included cold ischemic time (P = .031), HLA mismatches (P = .028), and occurrence of DGF (P = .033). The degree of HLA-DR expression (range 0 to 2) correlated significantly with early graft loss (2.0 +/- 0.2 vs 1.33 +/- 0.9 for graft function, n = 37; P = .01) as well as the ET-1 expression with DGF (2.0 +/- 0.3 vs 1.5 +/- 0.7 versus no DGF, n = 37; P = .016). In summary, marginal donors should be seen as high immunological risk situations that need careful conditioning.

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