Effect of dialyser biocompatibility on recovery from acute renal failure after cadaveric renal transplantation

Sir,

The pathogenesis of early graft dysfunction (EGD) is multifactorial. Whilst a plethora of studies have been directed at most aspects playing a role in EGD, little attention has been given to the effect of haemodialysis on the course of poor graft function [1,2]. We have read the article of Romao et al. [3] with interest. However, the claims of the authors that the use of more biocompatible membranes had no influence on the recovery from acute renal failure (ARF) after renal transplantation is beyond the data presented. The study has a number of severe drawbacks.

Various circumstances may lead to immediate ARF after renal transplantation depending on both the donor and the recipient and encompassing immunological and nonimmunological causes. Acute tubular necrosis (ATN) represents a major cause of oliguria after graft revascularization, but the severity of ischaemic changes in the graft may be increased by superimposed rejection or by nephrotoxic effects of cyclosporin. The authors have not performed renal biopsies at recruitment. ATN is not a clinical diagnosis, but is reached by exclusion of other causes by renal biopsies in the early post-transplantation phase. The prevalence of ATN after cadaver renal transplantation has been reported to vary between 20–30% [4,5]. In Romao’s study, both the high incidence of dialysis dependent ARF (53 out of 95, 56%) as well as the biopsy findings taken in selected patients during the study (three patients had biopsy proven rejection, one had primary non-function, two had vascular thrombosis and three had died, cause not given) contradicts the authors’ statement, that ARF after renal transplantation is a good clinical example of ‘ischaemic ATN’. Given the well documented overall incidence of dialysis dependent ARF in up to 60% of patients (56% in Romao’s study) and a prevalence of ATN between 20–30% one would expect that between 19 and 29 patients of Romao’s group should have been included in the study, if biopsies had confirmed a diagnosis of ATN. No group has been able to produce a perfect clinical index to predict which graft recipients develop ATN. Therefore matching of study groups on pre- or post-transplant clinical parameters creates confusion.

Blood–membrane interactions resulting in complement and cell-activation play a central role in the bioincompatibility reactions attributed to non-modified cellulosic membranes. Interactions of activated cells with endothelial cells and invasion of leukocytes in renal tissues cause injury by releasing nephrotoxic mediators. However, induction of immunosuppressive therapy with cyclosporin, corticosteroids and azathioprine generally suppresses all immune responses, affecting the number of circulating cell, cell proliferation and division, cell traffic and invasion, as well as elaboration of cytokines and other inflammatory substances. There are good reasons to argue that immunosuppressive drugs could attenuate some or all end-organ effects.

Romao et al. claim that their data refute the hypothesis that exposure to cellulosic dialysis membranes of poor biocompatibility has a detrimental effect on the course of ARF after renal transplantation. However, they did not examine parameters indicating bioincompatibility reactions (e.g. complement activation, generation of inflammatory mediators, leukocyte count, etc.) and they used immunosuppressants which are likely to block bioincompatibility reactions regardless of the membrane used for dialysis. Moreover, the authors studied a so called bioincompatible membrane (cuprophane) and a membrane with an intermediate potential to activate complement and cell activation. They might have been better advised to use a highly biocompatible membrane for comparison.

Recovery of renal function in ARF after renal transplantation may be influenced by systemic haemodynamics. However, neither parameters of the periooperative or postoperative hydration status (measurements of central venous pressure or pulmonary arterial pressure), nor blood pressure recordings or the number of hypotensive episodes during haemodialysis sessions are mentioned.

Formally, the number of dialysis sessions depends both on the criteria necessitating initiation of dialysis as well on criteria allowing termination of dialysis therapy. Neither biochemical data nor the number of hypervolemic patients per group nor biochemical data and the daily urine volume at termination of dialysis are given. The authors stated that the duration of dialysis sessions varied between 2.5 and 4 h; therefore the question arises, whether there were differences in the total hours of dialysis therapy between the groups.

The majority of the data published so far indicate that delayed graft function has a marked impact on graft survival [6,7]. There is agreement that patients participating in prospective clinical trials in transplantation should be assigned to various treatment groups based on histological diagnosis of IDGF [8]. The study by Romao et al. has not only major flaws but adds nothing to the question whether haemodialysis per se or choice of membrane has an impact on the course of ATN after renal transplantation. The data of these authors do not present scientific evidence which would allow to refute the hypothesis presented in 1994, namely that the use of cellulosic membranes adversely affects the outcome of ARF in critically ill patients [9,10].

Department of Nephrology
Klinikum Innenstadt der Universität München
München
Germany

5. Lechevalier E, Dussol B, Luccioni A et al. Posttransplantation