Letter to the Editor

Blood Purification

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Concerning the Article by Vanholder et al., Blood Purif 2000;18:1–12

The Role of Dialyzer Biocompatibility in Acute Renal Failure

Helmut Schiffl, Munich

Dear Sir,

Despite the introduction of continuous renal replacement therapies into the management of acute renal failure (ARF), intermittent hemodialysis (IHD) remains the most commonly used modality. The pattern of prescription of dialyzer membranes for ARF has changed dramatically with the advent of newer dialyzer membranes, which differ from cellulosic membranes in their potential to induce bioincompatibility reactions. Two recent surveys indicate that only 8% of the patients with ARF requiring dialysis were treated with cuprophane membranes [1, 2]. It remains to be shown, whether the choice of a biocompatible membrane for the treatment of ARF is merely an extrapolation of the strategies used for chronic renal failure, or whether it reflects evidence-based therapy for ARF. The comprehensive editorial review by Vanholder et al. [3] provides a useful addition to the literature, but fails to comment conclusively on the potential impact of biocompatiblity for dialytic therapy for ARF.

Five crucial clinical questions were not adequately addressed:

(1) Does the same membrane type induce different degrees of biocompatiblity when used in ARF or end-stage renal disease? Up until now, the reported experience is restricted to a few studies demonstrating that both the underlying disease precipitating ARF as well as uremia may cause leukocyte activation and diminish differences in clinical outcome between membranes with intermedium or low biocompability [4].

(2) Is the natural course of ARF affected by bioincompatible membranes? The aim of the early studies was to test this hypothesis. Mortality was only a secondary endpoint. Our first abstract, for instance, dealt with recovery from renal failure rather than mortality [5]. A recent meta-analysis of controlled trials by Karsou et al. [6] indicates that the use of unsubstituted cellulosic membranes has a negative impact on the survival rate of patients with ARF. The overview of published studies by Vanholder et al. [3], including full papers or abstracts, clearly shows that recovery of renal function was delayed in patients receiving cuprophane membranes by comparison to patients treated with biocompatible membranes (121/250(48%) vs. 101/161 (65%), despite possible sources of variability including definition of biocompatibility of the membrane tested, age, comorbid conditions, etiology of ARF, presence of oliguria, the dialyzer characteristics (e.g. surface area and flux), follow-up duration and sample size.

(3) Are extreme differences in biocompatibility of dialyzer membranes associated with differences in outcome? The overwiew of studies by Vanholder et al. [3], comparing cuprophane and biocompatible membranes clearly demonstrate that there is a significant difference in mortality (199/4634 vs. 284/536). The notion that there was not a single study showing superiority of cuprophane membranes by comparison with more biocompatible membranes is of great clinical importance. The higher mortality associated with the use of cuprophane membranes for the treatment of ARF may by explained by the delay in recovery of renal function. Recent studies highlighted that renal failure per se may increase morbidity and mortality in patients with ARF [7, 8]. In the study by Jörres et al. [9] 117 reasons for 66 fatalities were given. By contrast, our study was based on international definitions of septicemia/systemic inflammatory response syndrome and their lethal sequelae [10]. None of our patients had septicemia or SIRS as cause of renal failure nor were these syndromes present at the initiation of dialysis treatment. Fatalities were categorized either as sepsis-related or nonrelated deaths. The causes of death reported in our study were checked by an independent ethical committee. These differences between both studies highlight the notion that providing a plethora of data does not necessarily mean providing more information.

(4) Is the use of biocompatible membranes harmful to patients with ARF? A number of well-controlled prospective studies investigating this issue demonstrated no detrimental effect of these membranes when compared with cuprophane.

(5) Is it justified to recommend biocompatible membranes for ARF therapy? I

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would say yes to both intermediate and highly biocompatible membranes. However, choosing a more biocompatible membrane means paying more for uncertain but potentially improved outcomes in selected patient groups. Given the astronomic costs of prolonged ICU management of critically ill patients with ARF, the costs of the chosen membranes add little if any to the overall costs [11].

The 'scientific' counter-arguments against the use of biocompatible dialyzer membranes in ARF reminds me of the arguments used by the tobacco industry, who claimed for decades that smoking wasn't really dangerous for your health. The majority of nephrologists or intensivists caring for patients with ARF have made a clear decision.

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