Editorial

Treatment of Multiorgan failure

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One of the symposia at the 11th Annual Meeting of the International Society of Blood Purification held in Trondheim in September 1993 was headed: Acute Renal Failure/Multiorgan Failure: New Therapeutic Trends. The object was very complex as it dealt with posttrauma and postsurgical complications, infectious and immune mediators which in turn could activate different cascade systems, azotemia, fluid and electrolyte balance etc., all of which may be followed by renal failure and derangements in protein, fat and glucose metabolism. The outcome is often poor in critically ill patients in the above categories, and there are numerous controversies in the field regarding treatment strategies. The object of the symposium was to discuss which patient category would benefit from these novel therapies, when to start the treatment and how.

The goal of treatment in patients with acute renal failure/multiorgan failure (ARMF) is to remove toxic products, restore volume and electrolyte disturbances, maintain circulation and blood pressure and at the same time give the patients adequate nutrition.

Kaplan discussed different treatment strategies pointing out the importance of an early start of dialysis at a serum BUN level not higher than 100 mg/dl (= urea of 36 mmol/l). The survival of the patients depends on the dose of therapy given and the BUN level should be kept continuously below 100 mg/dl. These patients often have vascular instability requiring considerable amounts of fluid which on the other hand may cause lung edema. The best way to control this is to use continuous hemofiltration, continuous arteriovenous (CAVH) or venovenous (CVVH) hemofiltration, increasing the effect of both modules employing a pump. Hemodynamically unstable patients are often intolerant of the rapid fluid removal taking place with intermittent conventional hemodialysis.

The benefit of apheresis in patients with sepsis or septic shock has been debated during the last decade. Kaplan points to the importance of using the APACHE II score correctly in the evaluation of the outcome of apheresis because an APACHE score of 28 gives an expected mortality of 43% with predominantly renal failure increasing to an expected mortality of 72% with gastrointestinal involvement.

Stegmayr contributed two papers. The first one entitled Plasmapheresis in Severe Sepsis and Septic Shock gives basic information on mechanisms leading to severe complications in septic patients, while the second gives his own experience with 25 consecutive septic patients treated with plasma exchange. He reports from his own experience that plasmapheresis might have saved 80% of the patients in whom 20% survival was expected by an initial evaluation. Sixty percent of the patients were dialysis-dependent at the start of treatment, but recovered renal function. The importance of

the search for infectious foci and early surgical intervention is stressed because 3 out of 5 patients died due to inadequately drained abscesses.

The most serious side effect during apheresis is the use of fresh frozen plasma (FFP) as substitution fluid. Stegmayr reports that this can be significantly reduced by using stored plasma, and FFP should be used only in patients with disseminated intravascular coagulation and bleeding.

Alvestrand delineated the mechanisms leading to the development of hypermetabolism in patients with ARMF. The catabolic state is mainly caused by persistent hypoperfusion and inflammation or infection. Malnutrition leads to impaired immunocompetence and increased frequency of infections and delayed wound healing. It stimulates further the release of several signal substances enhancing the catabolic state. Nutritional support increases whole body protein synthesis while protein catabolism is unaltered. He points out that the nutritional therapy for which guidelines are given preferably should be given enterally if the gastrointestinal tract is functional, and in doses as recommended in a patient with preserved renal function. Only specific abnormalities due to renal failure should be adjusted, keeping in mind that the energy expenditure by acute renal failure in mechanically ventilated patients may exceed 20-40% of the normal requirement. The side effects of nutritional therapy due to renal failure

are controlled by dialysis or hemofiltration.

The following conclusions may be drawn. It is important that such patients are evaluated in good time by the team taking care of dialysis and apheresis. Dialysis should start early, i.e. at a serum BUN level not higher than 100 mg/dl. Treatment should be sufficient to keep the BUN level continuously below 100 mg/dl. In order to control fluid and electrolyte balance with respect to an adequate circulation and respiratory capacity, CAVH or CWH is superior to intermittent treatment. Plasmapheresis is a promising tool needing further evaluation in critically ill patients with ARMF, and should be done in cases where conventional treatment fails. The APACHE score should be evaluated properly with special attention as to whether gastrointestinal involvement is present or not. Infectious foci should be looked for in patients with sepsis, and proper surgical intervention should take place as soon as possible. FFP as substitution fluid in plasmapheresis should be used with care, and only in patients with DIC or bleeding. Adequate nutrition in ARMF patients, preferably given enterally, is essential. The extra requirement regarding protein and energy should be kept in mind. Even with these provisions in mind, however, the prospect of improving survival remains uncertain.

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