Continuous Hemofiltration in Children with Abdominal Complications of Hemolytic-Uremic Syndrome

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Dear Sir,

Hemolytic-uremic syndrome (HUS) continues to be the commonest cause of oliguric acute renal failure in infants and young children in many countries around the world [1], including Chile [2]. Although variable among pediatric centers, approximately more than a half of these patients will require a dialytic therapy, mainly peritoneal dialysis (PD) [3]. In a small percentage of these cases, PD may have relative or absolute contraindications, usually when HUS is associated with severe intra-abdominal complications [4]. We describe our experience with pediatric patients affected by HUS and abdominal complications who required continuous hemofiltration.

During the last 3 years, we have treated 5 children (3 girls and 2 boys; median age 18, range 9-64 months) with HUS aggravated by oligoanuria and severe intra-abdominal complications: colonic necrosis and partial colectomy in 3 children, intestinal intussusception and colonic ischemia in 1, and severe enterococcal peritonitis following unsuccessful PD in 1 child. Intravenous administration of furosemide was attempted without any diuretic response in all cases. In 4 patients, continuous arteriovenous hemofiltration (CAVH) from the femoral artery to the contralateral femoral vein was performed; in the 5th patient, we employed continuous venovenous hemofiltration (CVVH) by using a roller pump (Minipump® RS-7800; Renal System, Minneapolis, Minn., USA) through a dual-lumen catheter in the femoral vein. Hemofilters Renal® (0.25 m2; Renal System) were used, with continuous anticoagulation with heparin (10-20 IU/kg/h) in all cases, adjusting the rate accordingly to keep the activated coagulation time or the activated partial thromboplastin time close to 1.5 times the baseline values. Replacement solution was infused at a rate of approximately 200 (range 150-300) ml/h. The ultrafiltration volume was adjusted using an infusion pump (AVI 400A; 3M, St. Paul, Minn., USA) to obtain the desired preprogrammed reduction in weight, but never exceeding 0.5 ml/kg/min.
The mean duration of hemofiltration was 69 h (range 12-110 h), requiring a mean of 1.2 filters/patient. Adequate control of volume was achieved in all patients; in addition, diatleftration with peritoneal dialysis solution (Dianeal® PD-2, 1.5%; Baxter Laboratories, Cali, Colombia) was added in 1 patient to improve the uremia. Only 1 patient had bleeding severe enough to require blood transfusions; no other important complications were attributed to the procedure. Mild electrolyte imbalance and acidemia were observed and rapidly corrected. The procedure was terminated due to improvement of diuresis (urine output > 0.5 ml/kg/h) in 3 cases and transfer to PD in 2. Diuresis > 1 ml/kg/h was reached on average after 17.8 (range 12-28) days. All patients were discharged from the hospital after a median period of 20.6 (range 5-39) days in the intensive care unit. The follow-up period is still too short (< 6 months in 2 patients) to evaluate the long-term outcome, but the serum creatinine level is within the normal range for age after 1 year in 3 cases.

Continuous hemofiltration has become an effective and safe procedure in the management of acute renal failure in critically ill children [5, 6]. Because it does not need highly trained personnel and because of its fast implementation, this procedure has reached a place among the ‘essentials’ in modern pediatric intensive care units around the world. Indications for CAVH-CVVH in pediatrics are subject to constant revision and expansion, even including clinical situations with nonoliguric acute renal failure or without deterioration of kidney function at all, but where the reduction in the plasma concentration of circulating deleterious molecules may be crucial [7, 8]. Regarding the use of continuous hemofiltration in HUS, this procedure is scarcely mentioned, probably due to the wide and longstanding use of PD in patients who develop marked uremia or oligoanuria with hipovolemia. Unfortunately, HUS – or its treatment – may be associated with severe intra-abdominal complications [4, 9] which contraindicate PD or at least make it unfeasible. In these patients, CAVH-CVVH, with or without dialfiltration, may offer a good therapeutic alternative while the intra-abdominal complication is treated, allowing PD later on if necessary. In this sense, our series, to our knowledge the first published to date in this regard, favors the use of continuous hemofiltration as an excellent method of acute renal replacement therapy in pediatric HUS cases in whom the use of PD may be unsuitable.

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