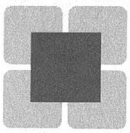

JOSEPH V. NALLY, Jr, MD, AND MARC A. POHL, MD, EDITORS

Clinical nephrology update

DIALYSIS-RELATED PERITONITIS RATES DECLINING

Changes in the design of the exchange systems in continuous ambulatory peritoneal dialysis have significantly reduced the rates of peritonitis and could lower the dropout rate from peritoneal dialysis. For most patient groups there is a significant difference between peritoneal dialysis and hemodialysis in terms of patient survival.

The drop in peritonitis rates is apparently due to two factors: the flushing action of peritoneal dialysis, and the use of intraluminal antiseptics. At the Cleveland Clinic, the peritonitis rates have dropped from the 1986 rate of one episode per 10 patient-months to the current rate of one episode per 20.3 patient months. With automated peritoneal dialysis, rates of one episode per 40 patient months and better can now be achieved. Some centers in the United States, Japan, and Europe have achieved peritonitis rates of fewer than one episode per 35 patient months.

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TREATING HYPOMAGNESEMIA

Hypomagnesemia, which can result from renal losses associated with diuretics, nephrotoxic agents, or diarrhea, is best treated with a sustained but gradual infusion of magnesium ions into the circulation. Hypomagnesemia can lead to deficient cytosolic stores of the magnesium ion, which apparently modulates calcium and potassium channels in cardiac cells. Hypomagnesemia in hospitalized patients has been associated with ventricular arrhythmias, especially during ischemia. Achieving equilibrium between cytosolic stores and extracellular fluid is a slow process; hence, the need for gradual infusions. For mild or asymptomatic hypomagnesemia, this is best done with oral sustained-release preparations.

Besides increased susceptibility to arrhythmias, symptoms of hypomagnesemia include widening of the QRS, prolonged PR interval, and possibly tetany. Treatment of symptomatic hypomagnesemia involves intravenous or intramuscular infusions of 50% magnesium sulfate ($MgSO_4$): intravenously, either 4 mL $MgSO_4$ per 200 mL of dextrose 5% in water (D5W) over 20 minutes, or 10 mL per 1,000 mL D5W over 24 hours is recommended. The $MgSO_4$ solution can be injected intramuscularly at 2 mL six times at 4-hour intervals.

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LACTIC ACIDOSIS: CAUSES AND TREATMENTS

Lactic acidosis commonly occurs as a consequence of a primary disease process; therefore, therapy usually entails treatment of the underlying condition, which is usually associated with hypoperfusion. Lactic acidosis can develop in uncontrolled diabetes mellitus, severe hepatic dysfunction, septicemia, catecholamine excess from conditions like pheochromocytoma or epinephrine overdose, and thiamine deficiency. Exogenous agents such as biguanide, ethanol, methanol, ethylene glycol, fructose, sorbitol, and xylitol have been linked to lactic acidosis. Lactic acidosis can also result from congenital defects in gluconeogenesis and pyruvate oxidation, and or from deficiency of

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Symposium directors: Dr. Nally and Dr. Pohl, Department of Hypertension and Nephrology, The Cleveland Clinic Foundation.

mitochondrial nicotinamide-adenine dinucleotide; these problems are most commonly observed in children. Once the underlying condition has been identified, the lactic acidosis itself can be treated by restoration of vascular volume, perfusion, and oxygenation. Though the use of alkali therapy remains controversial (primarily because of increased carbon dioxide production), the use of an equimolar solution of disodium carbonate and sodium bicarbonate (Carbicarb) prevents generation of carbon dioxide when added to acidic blood. Results of studies of Carbicarb in animals have been encouraging, but studies in humans are lacking. Its use in humans is still considered experimental.

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THE CHALLENGES OF HIV NEPHROPATHY

Of the several histologic patterns of glomerulopathy seen in patients who are infected with the human immunodeficiency virus (HIV) or who have the acquired immunodeficiency syndrome (AIDS), HIV nephropathy is the most important and can even be seen in asymptomatic HIV carriers. It is the most common lesion seen in HIV patients undergoing renal biopsy, and the resulting renal insufficiency is followed by a rapid progression to end-stage renal disease. Demographically, in a study conducted at Columbia Presbyterian Medical Center in New York, 96% of the HIV nephropathy patients were black, 4% were Hispanic, and none were white. Most were intravenous drug abusers. Clinically, the average serum creatinine was 5.4 mg/dL and serum albumin was 2.2 g/dL. Sixty-two percent of the population had edema, and 39% had hypertension. In another study, the mean time from diagnosis to uremia was 3 to 4 months in patients with creatinine clearance rates greater than 66 mL/minute.

Treatment is difficult. Zidovudine (AZT) has not been shown to be effective. Cyclosporine has led to remission in a few pediatric patients, but the risks of such treatment in an immunocompromised population is significant and therapy is of unproven value. Dialysis and support are indicated for patients without full-blown AIDS. Whether dialysis will prolong useful life in AIDS patients is still open to debate.

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KIDNEY STONES: HAVE THE INDICATIONS FOR SURGERY CHANGED?

Despite the advent and widespread use of extracorporeal shock-wave lithotripsy (ESWL), the indications for intervention for kidney stones have not changed. Patients who have progressive obstruction, associated infection, or intractable bleeding (rare) are all candidates for intervention. Most importantly, patients with stones judged by size to be unlikely to pass spontaneously (≥5 mm in diameter) should be offered intervention. When ESWL fails or is contraindicated, percutaneous or transureteroscopic procedures using ultrasound or laser may be used effectively in place of standard surgical intervention. Currently, less than 1% of patients with kidney stones require surgery.

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