

# ARGININE MONOHYDROCHLORIDE—A SOURCE OF CHLORIDE IN THE TREATMENT OF HYPOCHLOREMIC STATES

## A Clinical Note

RICHARD C. BRITTON, M.D.

Department of General Surgery

**I**N certain clinical conditions a metabolic derangement may require rapid correction of severe hypochloremia. The administration of sodium chloride as a source of chloride may necessarily be limited because of the dangers of overloading with sodium, and an adequate amount of ammonium chloride may be contraindicated in cirrhotic patients because of the risk of inducing coma. Massive chloride replacement with potassium chloride and calcium chloride is not possible, particularly in patients who are dehydrated and oliguric, because of the potential toxicity of the associated cation. Hydrochloric acid for intravenous use is not usually kept available and may not be suitable in certain clinical situations.

On the other hand, arginine is available as arginine monohydrochloride; the molecular formula is  $C_6H_{14}N_4O_2$  HCl. When prepared as a solution containing 25 gm. of arginine hydrochloride in 500 cc. of distilled water, the chloride content is 119.4 mEq. The tonicity of this solution is approximately 575 m-osM.

The mixture is prepared for clinical use (intravenous) by adding 25 gm. of arginine monohydrochloride to 500 cc. of distilled water, filtering it to remove any particles contaminating the analytically pure commercial reagent, adding to it 0.3 gm. (0.06 per cent) of potassium metabisulfite as a preservative, and autoclaving the solution for 20 minutes at 15 pounds of pressure. The arginine monohydrochloride is stable at room temperature for long periods. In clinical usage it has proved to be nontoxic when given in amounts as rapidly as 25 gm. in 15 minutes and a total amount of 250 gm. in 24 hours.

A typical clinical situation in which arginine monohydrochloride may be useful is that of the cirrhotic patient with ascites, obstructing duodenal ulcer, and a severe hypochloremic hypokalemic alkalosis. In such a patient the use of excessive amounts of sodium chloride is contraindicated because of the ascites, and the use of ammonium chloride in large amounts is contraindicated because of the danger of precipitating ammoniogenic intoxication. However, the intravenous administration of arginine monohydrochloride and potassium chloride corrects the metabolic imbalance rapidly and safely without increasing ascites or inducing intoxication. In a few patients in whom ammonia intoxication existed, such treatment was associated with a dramatic reduction in ammonia in the peripheral blood, and the clearing of coma or stupor coincident with the correction of the hypochloremia. A concomitant transient increase in blood urea may occur as a result of accelerated urea formation in the liver.