

3rd International Conference on Nephrology & Therapeutics

June 26-27, 2014 Valencia Conference Centre, Valencia, Spain

Effect of sodium bicarbonate infusion in reversal of acute renal failure

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End stage renal disease (ESRD) is increased in diabetes despite use of renin-angiotensin axis (RAAS) inhibitor drugs which are considered to be renoprotective drugs. Acute renal failure (ARF) has been reported as a risk factor contributing to ESRD in diabetes. The purpose of this presentation is to demonstrate that ARF is reversible with slight or no risk for progression to ESRD. The aim here is to show that sodium bicarbonate infusion is an effective therapy in reversal of ARF. Three patients with ARF, two associated with RAAS inhibitor therapy and one associated with radio contrast material are described. In the RAAS inhibitor treated patients eGFR varied from 10-12 ml/min upon hospital admission, both had metabolic acidosis. In the one with radiocontrast study eGFR decreased from baseline 31 ml per min to 16 ml/min 48 hours after the use of contrast. All of them were treated with Sodium Bicarbonate Infusion (900 ml isotonic saline and 100 l [100 MEQ] Sodium bicarbonate in a liter bag) at a rate of 75 ml for 72 hours, then at 50 ml/hour for another 48 hours. Serial renal function parameters and electrolytes were obtained.

Renal function improved to baseline or better in all three patients. eGFR increased to 53, 56 and 48 ml/min ($n \geq 60$ ml/min), respectively. In one of the two RAAS treated patients, ARF redeveloped in 48 hours after she retook RAAS inhibitor drug by mistake after returning home. eGFR decreased from 56 ml/min to 14 ml/min improving again to 34 ml/min with sodium bicarbonate infusion for 48 hours. In conclusion, sodium bicarbonate infusion is efficacious in reversing ARF of diverse etiology. Recovery is rapid when ARF is associated with metabolic acidosis, suggesting buffering of hydrogen ions is a facilitator of renal function recovery.

Biography

Anil K Mandal is a native of India and a naturalized citizen of the United States. He is board certified in Internal Medicine and Nephrology (kidney disease and hypertension). He is an author of a dozen books and more than 100 published articles on research in diabetes and kidney disease. He is a two-time Fulbright Scholar and a visiting professor in 23 countries that invited him to lecture on diabetes, high blood pressure, and kidney diseases.

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