

## CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

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### Acid-Base Balance-Electrolyte Quiz – Case 54

A 62-year-old patient with diarrhea-induced prerenal azotemia (serum urea 160 mg/dL and creatinine 2 mg/dL) and oliguria. Laboratory investigation showed: Serum sodium 133 mEq/L, potassium 3.2 mEq/L, chloride 105 mEq/L and  $\text{HCO}_3^-$ , 19 mEq/L. Urine sodium was 15 mEq/L.

Which is the appropriate solution for the patient's dehydration?

- Isotonic sodium chloride solution (0.9%)
- Hypotonic sodium chloride solution (0.45%)
- Hypertonic sodium chloride solution (3N)
- Lactate Ringer's solution.

The patient exhibited prerenal azotemia (increased serum urea/creatinine ratio and low urine sodium concentration) associated with hypovolemic hyponatremia and oliguria. It is clear that in the face of profound hypovolemia and hyponatremia, hypotonic sodium chloride solutions are contraindicated. Hypertonic sodium chloride solutions are used in cases of acute symptomatic hyponatremia. Isotonic sodium chloride solutions

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can be used for the patient's dehydration; however, its administration is commonly associated with hyperchloremia, which may adversely affect renal hemodynamics, and hyperchloremic metabolic acidosis with its devastating consequences. Thus, in our patient with relatively increased serum chloride and low bicarbonate levels –due to diarrhea– balanced crystalloid solutions (that is Lactate Ringer's infusate) are the solutions of choice. Since this infusate also contains potassium (4 mmol/L) and lactate as a buffer, which is metabolized to  $\text{HCO}_3^-$ , is especially indicated in hypovolemic patients with metabolic acidosis or hypokalemia.

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*Answer: Lactate Ringer's solution*