

Update Review of Free Water Deficit in Hypernatremia

Lynda Szczzech, MD, MSCE, FASN, FNKF

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Abstract

Calculates free water deficit by estimated total body water in a patient with hypernatremia or dehydration.

I. HOW TO USE

When to Use

This tool should be used when a patient is hypernatremic but not volume depleted.

Pearls / Pitfalls

This tool provides an estimate of free water deficit based on a patient's body weight; this can be incorrect in patients with significant weight gain or loss (especially from fluid sources).

Why Use

This formula should be used to estimate the amount of free water that needs to be provided (in addition to ongoing free water needs) to correct an elevated serum sodium.

II. NEXT STEPS

Advice

- Hypernatremia is an elevation in serum sodium. This indicates a free water deficit or dehydration.

- In addition to calculation of the free water deficit, the cause should be determined (e.g. loss of free water in the urine or stool, or lack of access to sufficient free water)
- Patients may simultaneously be volume depleted as well as dehydrated.
- If this is suspected, correct the volume deficit with isotonic fluids first before correcting the water deficit that is calculated here.

Management

- This formula calculates the total solute in the patient's total body water, and then determines how much water needs to be added to the solute to dilute it to the desired serum sodium.
- Sufficient free water should be provided through either an oral route or an intravenous route (using a solution such as 5% dextrose) to correct the serum sodium by up to 10 meq/L in the first 24 hours.

III. EVIDENCE — FROM LIVE PAGE

Formula

Free water deficit, L = (% total body water, fraction)*(Weight, kg)*([Current sodium/Ideal sodium] – 1)
where % total body water (TBW) is:

- Adult male: 60% (i.e., use 0.6 in the equation)
- Adult female: 50% (0.5)
- Elderly male: 50% (0.5)
- Elderly female: 45% (0.45)
- Child: 60% (0.6)

This formula calculates the total solute in the patient's total body water and then determines how much water needs to be added to dilute it to the desired serum sodium.

Sufficient free water should be provided either orally or intravenously (e.g., 5% dextrose) to correct the serum sodium by up to 10 mEq/L in the first 24 hours.

LITERATURE

Original/Primary Reference

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