

15th Annual Congress on

Kidney: Nephrology & Therapeutics

August 28-30, 2017 Philadelphia, USA



Elaine M Kaptein

University of Southern California, USA

A systematic literature review of sodium concentrations of body fluids: Clinical Application

Wide ranges of sodium concentrations for different body fluid losses have been noted with minimal substantiating data and variability among sources, leading to use of “cumulative fluid balance” regardless of composition in hospitalized patients. We defined sodium concentrations of body fluid losses by performing a systematic literature review in adult humans using PubMed database. Inclusion criteria were met for 107 full-text articles. Mean sodium concentrations were significantly lower for acidic (mean+SD:44+12 mEq/L) than for alkaline (55+13 mEq/L) gastric fluid, higher for bile (184+24 mEq/L) or pancreatic fluid (156+3 mEq/L) than all other body fluids, and similar between intact small bowel (119+14 mEq/L) and ileostomy outputs (116+25 mEq/L). Sodium concentrations were significantly greater for cholera-induced diarrhea (128+18 mEq/L) and lower for osmotic-induced cause (28+16 mEq/L) than all other causes of diarrhea. For osmotic diarrheas, sorbitol-induced diarrhea sodium concentration was higher (63+17 mEq/L) than for carbohydrate malabsorption (43+20 mEq/L), lactulose (26+19 mEq/L), Idolax (16+13 mEq/L) and polyethylene glycol (13+7 mEq/L). For pleural, peritoneal, and edema fluid, sodium concentrations (137+13 mEq/L) were similar to plasma. In summary, this is the first in-depth review of verifiable sodium concentrations of body fluids most commonly lost in hospitalized patients. Sodium concentrations are fluid-specific and consistent. Sodium concentrations of enteral and parenteral fluids have been summarized. (Clinical Nephrology 86 (10): 203-28, 2016. PMID: 27616761). We have used these data to develop a calculator to assess net volume and water inputs and losses, to facilitate prevention and treatment of free water and volume disorders in hospitalized patients. Case examples of this application are included.

Biography

Elaine M Kaptein has completed her MD in 1973 from the University of Saskatchewan, and her Internship, Residency and Fellowship at McGill University in Montreal Quebec in 1977. She is a Full Professor of Medicine at the University of Southern California, Los Angeles, CA. She has published 65 peer-reviewed articles in reputed journals.

ekaptein@usc.edu

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