We examined post-surgical hyponatremia, hypokalemia and acute kidney injury (AKI), associated with use of either IMF” Winata et al (2019).

Abstract:

BACKGROUND: Intravenous maintenance fluid (IMF) tonicity and composition influence plasma electrolyte balance.

OBJECTIVE: To determine if hypotonic IMF therapy contributes to post-surgical hyponatremia.

SETTING: Single-center tertiary institution.

PARTICIPANTS: Adults who underwent major surgery and received peri-surgical IMF, with exclusive administration of hypotonic pre-mixed 0.33% saline, 5% dextrose and potassium chloride (DK0.33%S), or isotonic 0.9% saline with or without 5% dextrose (NS/DNS).

OUTCOMES AND MEASURES: We examined post-surgical hyponatremia, hypokalemia and acute kidney injury (AKI), associated with use of either IMF.

RESULTS: We studied 659 patients, of whom 161 patients (24%) developed post-surgical hyponatremia. DK0.33%S (versus NS/DNS) IMF was administered in 52% of patients who developed hyponatremia, compared to 38% of patients with stable natremia (p=0.001). More patients with hyponatremia underwent gastrointestinal-hepatobiliary or abdominal (GI/HBS/Abd) surgery versus other surgical-sites (p=0.001). Hypokalemia developed in 1% versus 10% of patients who received DK0.33%S and NS/DNS IMF respectively (p<0.001), with corresponding AKI rates of 3% versus 7% (p=0.02). On multivariate analysis, adjusted for timing of biochemistry post-surgery, IMF infusion rate and volume; independent factors associated with post-surgical hyponatremia included DK0.33%S administration, GI/HBS/Abd surgery (versus other sites), and post-surgical AKI (p<0.05). Subgroup analysis by surgical sites showed that association of DK0.33%S administration with hyponatremia was most evident in GI/HBS/Abd surgery. CONCLUSIONS: Administration of DK0.33%S IMF, compared with NS/DNS, is associated with post-surgical hyponatremia in adults after major surgery, but with less hypokalemia. The higher rate of AKI observed with NS/DNS IMF requires further
evaluation.

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