Abstract:

Background: Patients with traumatic brain injury, cerebral edema, and severe hyponatremia require rapid augmentation of serum sodium levels. Three percent sodium chloride is commonly used to normalize or augment serum sodium level, yet there are limited data available concerning the most appropriate route of administration. Traditionally, 3% sodium chloride is administered through a central venous catheter (CVC) due to the attributed theoretical risk of phlebitis and extravasation injuries when hyperosmolar solution is administered peripherally. CVCs are associated with numerous complications, including arterial puncture, pneumothorax, infection, thrombosis, and air embolus. Peripherally infused 3% sodium chloride may bypass these concerns.

Aims: To explore the evidence for peripherally infused 3% sodium chloride and to implement the findings.

Methods: The Iowa Model of Evidence-Based Practice (EBP) was used to guide the project. A multidisciplinary team was established, and they developed an evidence-based protocol for the administration of 3% sodium chloride using peripheral intravenous catheters (PIVs), identified potential barriers to implementation, and developed targeted education to implement this practice change in a large academic medical center.

Results: Of the 103 patients in this project, only three (2.9%) identified adverse events. Two were associated with continuous infusions, and one was associated with a bolus infusion.

Linking action to evidence: This is the first study to describe a multidisciplinary protocol development and implementation process for the administration of 3% sodium chloride peripherally. Utilizing a multidisciplinary team is critical to the success of an EBP project. Implementing an evidence-based PIV protocol with stringent monitoring criteria for the administration of 3% sodium chloride has the potential to reduce adverse events related to CVC injury.

Reference:

Jannotta GE, Gulek BG, Dempsey JS, Blissitt PA, Sullivan HC, Tran K, Joffe A, Lele AV. Administration of 3% Sodium Chloride Through Peripheral Intravenous Access: Development and Implementation of a Protocol for Clinical Practice. Worldviews Evid Based Nurs. 2021 Mar 30. doi: 10.1111/wvn.12501. Epub ahead of print. PMID: 33783949.