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Study suggests using hypertonic saline infusions via peripheral catheter may help avoid complications

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Current recommendations that a central catheter is required for continuous intravenous infusion of 3 percent sodium chloride solution should be re-evaluated, according to a study in the *American Journal of Critical Care (AJCC)*.

The study, "Safety of Continuous Peripheral Infusion of 3% Sodium Chloride Solution in Neurocritical Care Patients," suggests that safe administration of continuous intravenous infusion of hypertonic saline via a peripheral catheter may help avoid unnecessary placement of central catheters, which could lead to fewer associated complications and lower healthcare costs.

This is the first study to examine the safety of peripheral administration of 3 percent sodium chloride solution in adults.

More than five million central catheters are placed each year in the United States, accounting for 15 million days of treatment with central access. Although valuable tools in patient care, central catheters are also associated with serious complications, such as catheter-associated bloodstream infections and symptomatic thrombosis.

Critically ill patients may receive hypertonic saline for a variety of indications, and numerous drug information resources recommend that the solution be administered via a central catheter. These recommendations may contribute to patients having a central catheter placed solely for the purpose of administering continuous intravenous infusions of 3 percent sodium chloride solution.

The research team included G. Morgan Jones, PharmD, BCPS, BCCCP, clinical pharmacy specialist at Methodist University Hospital, Memphis, Tennessee and assistant professor of clinical pharmacy, neurology and neurosurgery at University of Tennessee Health Sciences Center. He was joined by post-graduate pharmacy residents Lauren Bode, PharmD, from the University of North Carolina Hospitals and Clinics and Heidi Riha, PharmD, from Methodist

University Hospital and by Michael J. Erdman, PharmD, BCPS, clinical pharmacist at University of Florida Health, Jacksonville.

"We observed a limited number of infusion-related reactions even when 3 percent sodium chloride solution was administered peripherally for a prolonged time and even at rates as high as 75 mL/h," Jones said. "Current recommendations to infuse 3 percent sodium chloride through a central line only are largely based upon data from parenteral nutrition administration. Our data suggests that this may not be applicable to 3 percent sodium chloride infusions and current recommendations should be re-evaluated."

The researchers conducted a retrospective, multicenter cohort study at Methodist University Hospital and at the University of Florida Health, which are large urban teaching hospitals with dedicated neurocritical care teams. They examined the records of all patients who had continuous intravenous infusion of 3 percent sodium chloride solution via a peripheral catheter during a three-year period.

Of the 213 neurocritical care patients in the study, infusion-related reactions occurred in only 15 patients. Phlebitis occurred nine times, extravasation six times, with no documented episodes of thrombophlebitis.

Of note, eight of the 15 patients with infusion-related reactions had continuous intravenous infusion of 3 percent sodium chloride solution resumed at an alternative peripheral intravenous site with no further documented reactions. Although administration was changed to a central catheter in 56 patients, only five changes were due to an infusion-related reaction.

The most common electrolyte abnormalities were hyperchloremia (49.3 percent) and hypokelamia (46.9 percent), but the clinical importance of these remains unclear.

The researchers were also able to determine various sites of administration, needle gauges and infusion rates that might aid in characterizing the safety of continuous intravenous infusion of 3 percent sodium chloride solution via a peripheral catheter.

Source:

American Association of Critical-Care Nurses (AACN)
