

The Use of Non-Primed Peripheral and Central IV Tubing for Nesiritide Infusion is Reliable and Cost-Effective

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Background

Prescribing information of nesiritide mandates priming of intravenous tubing with 25 mL of nesiritide prior to connecting the intravenous (IV) line to the patient, since the drug may partially absorb to the line. Thus, 10% of a reconstituted vial is wasted, with a cost of \$40-50 per line used. No study has quantified the binding effect of nesiritide to intravenous tubing, tested binding properties of different materials, or analyzed binding effect of central lines, where priming cannot occur. Furthermore, prescribing information states that nesiritide must not be administered through a central heparin-coated catheter, since it may bind to heparin. However, no study quantified this binding effect.

Methods

1.5 mg vials of nesiritide were reconstituted into 250 mL 0.9% NS bags. A 23.3mL bolus, followed by 7mL/h 2-hour infusion (2ug/kg bolus, 0.01ug/kg/min infusion for a 70kg pt) were run, in duplicate, through 5 separate experimental tubing systems: 1) Standard PVC peripheral IV tubing primed with a 25 mL of nesiritide; 2) Standard non-primed PVC peripheral IV tubing; 3) Non-primed polyethylene peripheral IV tubing, commonly used for NTG infusion; 4) Non-primed PVC peripheral IV tubing, connected distally to a central IV polyurethane catheter; 5) Non-primed PVC peripheral IV tubing, connected distally to a heparin-coated pulmonary artery PVC catheter. Nesiritide concentration

was measured, in triplicate, in the initial bags and samples collected from the five IV settings, using Biosite BNP test (Beckman Coulter).

Results

More than 95% of nesiritide was recovered from all five IV settings. Priming of PVC tubing with nesiritide improved drug recovery by 2% during IV bolus and 2-hour infusion compared to non-primed PVC tubing. Polyethylene tubing improved drug recovery also by 2% at 1- and 2-hour time points, suggesting that polyethylene saturates faster than PVC. Connecting a triple lumen or heparin-coated pulmonary artery catheter distally to non-primed PVC tubing did not further impact percentage of drug recovery.

Conclusions

Priming of peripheral IV tubing with 25mL of nesiritide minimally improves drug release to patients since more than 95% of drug is delivered even without priming. Polyethylene IV tubing further minimize drug binding and offers an even more reliable, yet inexpensive, alternative to priming. Elimination of priming may result in \$40-50 saving per line used. Use of central lines or heparin-coated pulmonary catheter does not result in significant binding. Thus, changes in nesiritide prescribing information are warranted.

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