BACKGROUND

In a previous quality improvement study with data from nearly 500,000 patients, it was demonstrated that switching from a non-anti-reflux needleless connector (NCC) to an anti-reflux connector produced:

- 48% reduction in IVA across
- 90% reduction in IV visits
- 27% lower patient endorsements for clamped catheters
- Savings of more than $100,000 on IV, nursing expenses, and items related to treating the occlusion.

This current research examines the real cost of catheter occlusions and the function of neutral anti-reflux NCCs. Blood is often the first body fluid that comes into contact with IV catheters. Interactions between blood and IV catheter material trigger a complex series of events involving protein adsorption, platelet adhesion, activation, coagulation, and fibrinolysis. These biological reactions necessitate using anti-reflux technology that decreases the risk of occlusions and central line-associated bloodstream infections (CLABSIs).

PURPOSE

The purpose of this research was to study the clinical biological and functional differences between neutral anti-reflux needleless connectors and connectors without anti-reflux capabilities. Our hypothesis is that these new results were due to the anti-reflux needleless connector that neutralized blood proteins within the inner lumen of the IV catheter, thereby preventing biological reactions that led to thrombosis formation.

METHODS

Two in-vitro simulation studies examined how neutral and non-anti-reflux NCCs performed using IV containers with green and clear water.

- Test #1 simulated pressure changes by observing fluid movement between IV bags. This was accomplished by disconnecting an IV bag with dried fluid 2 inches above a clear bag.
- Test #2 used a simulated removal mechanism (Figure 3) to measure fluid reflux or displacement upon syringe connection and disconnection. A negative and positive fluid displacement represent reflux into the catheter and erosion toward the patient.

RESULTS

These two tests indicate anti-reflux technology can reduce uncontrolled blood reflux into IV catheters upon pressure changes, connection, and disconnection.

- Test #1 showed anti-reflux NCCs were able to stop blood reflux when pressure changes occurred in the closed IV system, while non-anti-reflux NCCs were not able to prevent bidirectional fluid movement.
- Test #2 demonstrated the anti-reflux NCC had the lowest amount of reflux upon both connection and disconnection.

The results demonstrate that anti-reflux NCCs may significantly reduce the amount of blood reflux upon disconnection of a syringe compared to NCs without anti-reflux technology for (5000). It is reasonable to hypothesize that increased volumes of blood reflux will lead to increased risk of intraluminal thrombotic catheter occlusions and bloodstream infections.

This is important for home infusion clinics because as demonstrated in the previous study, occlusions decrease nursing efficiency and increase costs associated with the treatment of occlusions and CLABSI.

DISCUSSION

This research demonstrates anti-reflux devices function differently than previously utilized anti-reflux NCs controlling bi-directional fluid movement and greatly inhibit blood reflux which promotes occlusions in the home care setting. Preventing occlusions has been shown to stop catheter on nursing visits, IV site costs associated to provide IV in the home, reducing significant costs, and increased patient satisfaction. Treatment of IV access, treatment of CLABSI and potential placement of new IV access. The use of anti-reflux NCs support the treatment of the patient and reduce complications from treating the patient.

CONCLUSION

REFERENCES

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DISCLOSURES

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