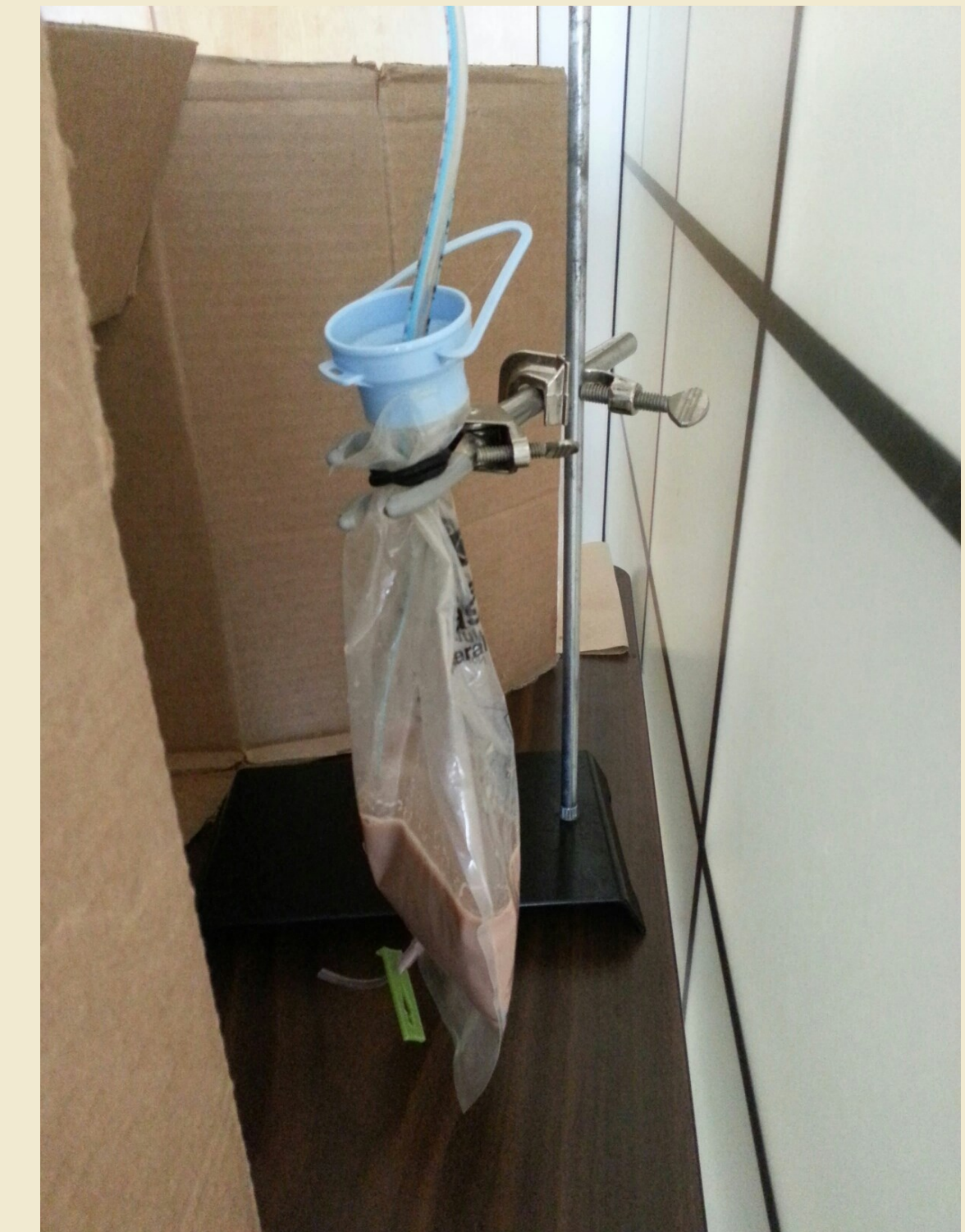


Does tube size affect the amount of Gastric Residual Volume assessed in different fluid viscosities?



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Introduction

In critically ill patients with feeding tubes, assessment of gastric residual volume (GRV) is used to determine patient tolerance to feedings and to protect against the likelihood of aspiration. Tube-feeding protocols usually call for frequent measurements of GRV to estimate gastric emptying. There are many discrepancies in which type of feeding tube is the most accurate in assessing GRV; little is known about the effect of feeding tube size or fluid viscosity on the accuracy of the amount of GRV measured. This study sought to (1) compare the volume of gastric contents obtained from 10-Fr and 18-Fr polyurethane feeding tubes concurrently positioned in the stomach and (2) if the viscosity of the stomach contents affect the volume able to be assessed from each feeding tube.

Objective

Our specific aim for this study was to determine whether there was a difference in accuracy of total GRV measured between the sizes of feeding tubes used and if fluid viscosity had an effect on the accuracy. Our study was conducted to test the limitation of order effect in Norma Metheny's study, *Effect of Feeding-Tube Properties on Residual Volume Measurements in Tube-Fed Patients*. The order effect previously mentioned was the continuous use of aspirating the small feeding tube first then flushing that feeding tube with 30mL of water and reassessing diluted GRV through the large feeding tube. Metheny accounted for the additional 30mL of water flushed, but did not control for the change in fluid viscosity. Metheny's study concluded that the GRVs obtained from large-diameter sump tubes were about 1.5 times greater than those obtained from 10-Fr tubes (Metheny, 2005, p 192).

Methods

- Nursing students in H365 were randomly selected and randomly assigned to aspirate from different feeding tube sizes. Design: Randomized controlled experiment with repeated measures.
- A 60mL syringe was used to perform all aspirates. The simulated stomach contained 300 mL of chocolate milk for all measurements performed with the first tube (Pre-tube), then the tube was flushed with 30 mLs of water and measurements were made with the second tube (Residual).
- GRV measurements were made from either the 10Fr or 18Fr polyurethane tube first (n=16) concurrently placed in the simulated stomach. GRV aspirates were returned by gravity to the stomach through the 18Fr and then the first aspirated tube was flushed with 30mL of water. Measurements were repeated in second assigned tube (n=16).

Limitations

- Sample size
- Time
- Changed methods on 7th participant:
 - GRV aspirates were returned to the stomach via 18Fr tube; for time purposes.
- Participants verbalized their measurements.

Figure 1: GRV Assessments



Results

There were no significant differences of GRV measurements aspirated between the 10Fr and 18Fr tubes when comparing fluid viscosities, $p > 0.05$. We controlled for the 30mL flush of water in our Residual measurements when we concluded our results.

Conclusion

In conclusion, the findings suggest that GRV aspirates obtained through either tube were not significantly different. Our study eliminated Metheny's limitation of order effect by randomly assigning which feeding tube to aspirate.

The findings of our study, indicate there are no proven benefits of using a large bore feeding tube in extracting gastric fluids. Both feeding tube sizes (10Fr & 18Fr) were shown to have no significant difference; which is in opposition to Metheny's findings. Furthermore, none of the measurements were very accurate.

References

- Metheny, N., Stewart, J., Nuetzel, G., Oliver, D., & Clouse, R. (2005). Effect of feeding-tube properties on residual volume measurements in tube-fed patients. *JPEN Journal Of Parenteral & Enteral Nutrition*, 29(3), 192-197.