

Improving Alteplase Administration Times through Simulation

Abstract

Kristen Hickey MSN RN, Carol DeGennaro DNP RN-BC CEN, Melissa Dibble MSN RN-BC CAPA

- The purpose of this quality improvement project was to use simulation as a teaching strategy to improve Emergency Department nurse confidence in the administration of Alteplase.
- In addition, the purpose of the performance improvement project was to improve administration times of Alteplase.
- Stroke causes significant long-term disability. Rapid Alteplase administration has been shown to decrease disability and improve patient outcomes.
- ED nurses play a significant role in the timely administration of Alteplase, from the recognition of stroke symptoms, notification of a stroke alert and the mixing and administration of Alteplase.
- The goal was to administer Alteplase within 60 minutes of arrival to the hospital in acute ischemic stroke patients.

INTRODUCTION

- Prior to this simulation, stroke education for the Emergency department staff consisted of an on-line module followed by a validation station where Alteplase was reconstituted.
- After identifying practice gaps through chart audits a stroke simulation scenario was developed using a standardized patient.

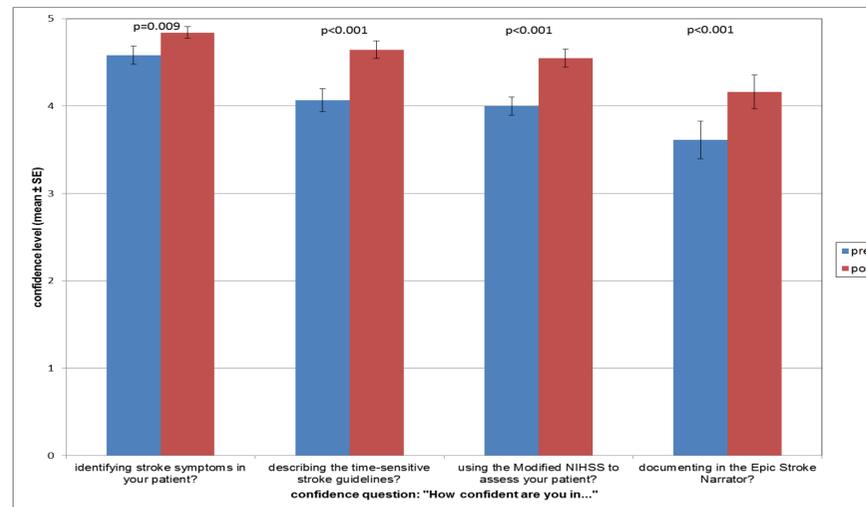
MATERIALS & METHODS

- Simulation sessions were scheduled for 30 minutes in groups of 3-4, in an Emergency department room.
- RNs completed the pre and post simulation survey which assessed knowledge and confidence levels of acute stroke care.
- The simulation focused on the assessment of an acute stroke patient using the mNIHSS, mixing the Alteplase and its administration using the smart pump.
- Each group was evaluated using a standardized checklist.
- Debriefing was conducted by the Stroke Coordinator after each simulation. Topics discussed included items on the pre-simulation survey, the importance of rapid Alteplase times and ideas to decrease administration times.
- In the time period studied, no additional educational initiatives occurred in the ED.
- A paired t-test was used when comparing confidence intervals.
- A Fisher's exact test was used when comparing door to Alteplase administration times and the percentage of improvement in those times.

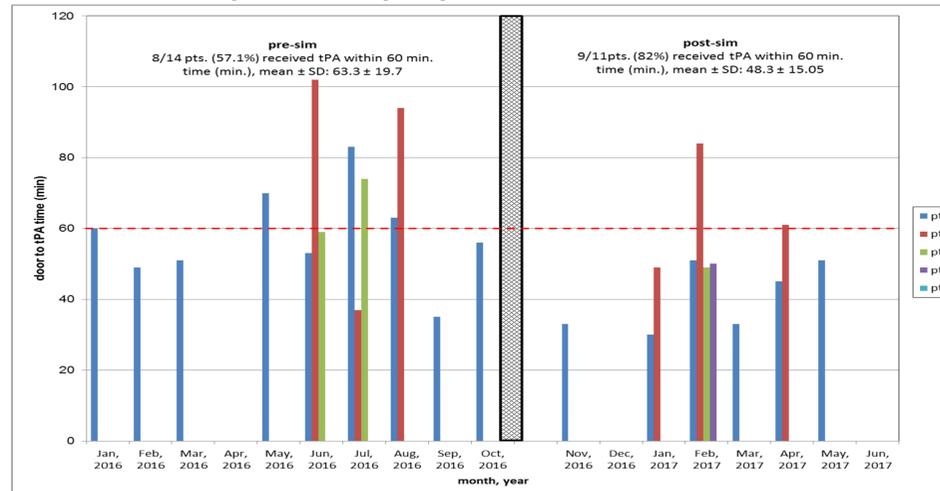
RESULTS

- Following simulation, RN participants reported higher level of confidence in all 4 nurse role action questions. ($p < 0.009$)
- The mean door to needle time decreased from 63 minutes pre-simulation (January 2016-October 2016) to 48 minutes post simulation (November 2016-June 2017) ($p = .162$).
- The percentage of eligible patient receiving Alteplase within 60 minutes was 57% pre-simulation and 82% post-simulation, and the likelihood to receive TPA in 60 minutes was 43% better after simulation (OR 1.43, $p = .442$).

Confidence Question results:



Door to Alteplase times pre/post simulation:



DISCUSSION

- Administration of IV Alteplase in acute ischemic stroke is the standard of care
- Using simulation as a teaching strategy mimics the stressful environment during Alteplase administration and helps to improve nurse comfort levels.
- Debriefing after the simulations allowed for information sharing and all staff questions to be answered.
- Though Alteplase administration times were not found to be statistically significant, this was due to low sample sizes.

CONCLUSION

- In this study, Alteplase administration times decreased by 15 minutes with a 43% better chance to receive Alteplase in 60 minutes.
- Simulation as a teaching strategy was shown to improve nurse confidence in delivery of acute stroke care.
- Results suggest knowledge and skills gained through simulation can positively impact patient outcomes by decreasing Alteplase administration times.

REFERENCES

- Jauch, E. C., Saver, J. L., Adams, H. P., Bruno, A., Connors, J. J., Demaerschalk, B. M., . . . Yonas, H. (2013). Guidelines for the early management of patients with acute ischemic stroke: A guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*, 44(3), 870-947.
- Knippa, S., Cox, S., & Flynn Makic, M. (2015). Simulation improves nurses' adherence with stroke quality measures. *Journal for Nurses in Professional Development*, 31(4), 197-202.