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Implementation of Coordinated Telestroke Program in an Urban Setting Improves Acute Stroke Care

John Zurasky
Providence Stroke Center, Providence Health and Services, john.zurasky@providence.org

Leslie Corless
Providence Stroke Center, Providence Health and Services, leslie.corless@providence.org

Lindsay Lucas
Providence Stroke Center, Providence Health and Services

Elizabeth Baraban
Providence Stroke Center, Providence Health and Services, elizabeth.baraban@providence.org

Influence of Initiation of a Telestroke Network on Acute Stroke Care in an Urban Setting

John Zurasky, MD, Leslie Corless, MPH, Lindsay Lucas, MS, Elizabeth Baraban, PhD
Providence Stroke Center, Providence Health and Services

PROVIDENCE Brain and Spine Institute

Background

- Telestroke has been shown to improve acute ischemic stroke (AIS) care in rural settings [1].
- Few studies have examined the impact of telestroke in an urban setting[2,3].
- There was a planned transition from an outpatient-based acute stroke providers to a centralized telehealth team of neurovascular and neurocritical care providers in an urban setting.
- The impact of this change was assessed by comparing patient outcomes during three telehealth implementation time periods: pre-initiation (PRE), transition after initiation (TRAN) and post-transition (POST)

Methods

- Data for AIS patients 18 and older from five urban hospitals were used.
- Outcomes included IV-alteplase or thrombectomy treatment rates and for those treated with IV-alteplase, hospital length of stay (LOS), door-to-needle time (DTN) <45 and <60 minutes, an IV-alteplase-related complication, and discharge to home or rehabilitation.
- Outcomes were compared between the three time periods: PRE (June 2015 - June 2016), TRAN (July 2016 – December 2016) and POST (January 2017 – March 2018).
- Chi-squared tests were used to compare treatment rates, Fisher's exact test for complication rates, Cox proportional hazards model for LOS, and generalized linear models for DTN<45, DTN<60, and discharged to home/IRF.
- Models were adjusted for arrival mode, gender, admission NIHSS, age, and Last Known Well (LKW)-to-arrival time. For discharged to home/IRF, DTN was also added as a covariate.

Conclusions

- A transition to a specialty stroke care through a telestroke network showed improvements in IV alteplase and thrombectomy treatment rates and percentage of patients with a DTN < 60 minutes.
- Similar to results seen in rural areas, patients in urban hospitals can also benefit from telehealth services.

References

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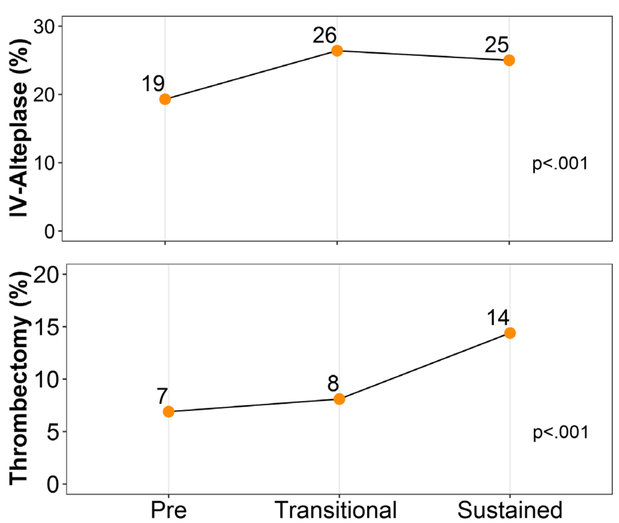
3. Amorim E, Shih MM, Koehler SA, et al. (2013). Impact of telemedicine implementation in thrombolytic use for acute ischemic stroke: the University of Pittsburgh Medical Center telestroke network experience. *J Stroke Cerebrovasc Dis*, 22:527–531.

Results

Table 1. Patient Characteristics

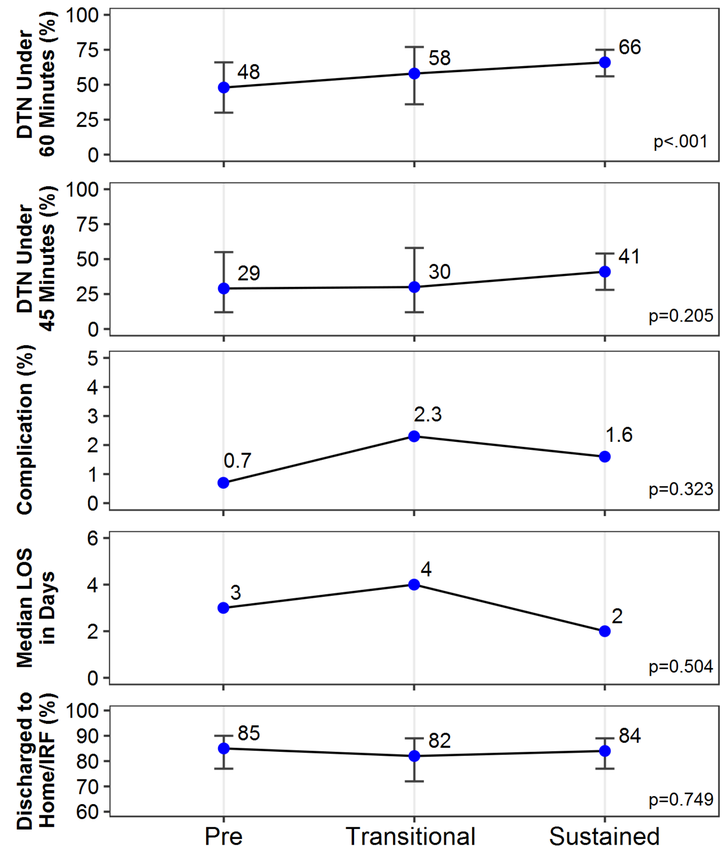
	PRE (n=1,468)	TRAN (n=819)	POST (n=1,463)	p-value
Mode of Arrival, % (n)				0.385
EMS	63.4 (930)	63.1 (517)	65.5 (958)	
Private car	36.3 (538)	36.9 (302)	34.5 (505)	
Sex, % (n)				0.052
Male	51.7 (759)	46.4 (380)	49.6 (726)	
Female	48.3 (709)	53.6 (439)	50.4 (737)	
Age, years median [IQR]	73 [61, 84]	75 [64, 85]	75 [63, 85]	0.008
Admit NIHSS, median [IQR]	5 [2,14]	5 [2,14]	5 [2,15]	0.695
LKW-to-arrival time (min), median [IQR]	323 [83, 349]	289 [71,1094]	312 [78,1075]	0.258
DTN (min), median [IQR]	57 [41,82]	54 [40,72]	49 [36,66]	<0.001

Figure 1. IV-alteplase and thrombectomy treatment rates



- Out of 3,750 patients, 1,468 (39.1%) were in the PRE period, 819 (21.8%) were in the TRAN period, and 1,463 (39.0%) were in the POST period.
- Between time periods, patients characteristics differed by sex, age and DTN time (Table 1).
- SUS and TRAN patients had significantly higher IV-alteplase treatment rates compared to PRE patients (p<.001) and SUS patients had significantly higher thrombectomy treatment rates compared to PRE or TRAN patients (p<.001) (Figure 1).
- After adjustment, a higher percentage of SUS and TRAN patients were treated by IV-alteplase within 60 minutes than PRE patients (p<.001) (Figure 2).
- There were no differences in complication rate, in DTN under 45 minutes, LOS, or discharge to Home/IRF (Figure 2).

Figure 2. Adjusted Outcomes for IV-alteplase treated patients



*For DTN<45, DTN<60, and discharged to Home/IRF, estimated marginal means with 95% confidence intervals are plotted.
**For all plots, p-values reflect overall effect of time period on outcome.