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Emergency Physician and Stroke Specialist Beliefs and Expectations Regarding Telestroke

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Abstract

Background—Telestroke has been effective in the management of acute ischemic stroke (AIS). This study characterizes and compares Stroke Specialist (SS) and Emergency Physician (EP) perceptions of telestroke and identifies barriers preventing increased implementation.

Methods—A survey was developed and distributed nationwide to 382 SSs via an online survey-system and in paper form to 226 EPs attending the 2008 American College of Emergency Physicians (ACEP) national conference.

Results—Stroke specialists perceived themselves to be more knowledgeable about telemedicine and telestroke ($p<0.001$ and $p=0.010$). A large majority of physicians in both specialties either strongly agreed or agreed that telestroke will reduce geographical differences in stroke management and that it is superior to telephone consultation. EPs perceived patient preference ($p<0.001$), rt-PA side effects ($p<0.001$), level of technology ($p=0.005$), and rt-PA not the standard of care ($p<0.001$) to be more significant obstacles to increased implementation of telestroke than SSs. However, SSs found increased personal work to be a greater barrier than EPs ($p<0.001$).

Conclusion—SSs and EPs report positive beliefs regarding telestroke, however perceived obstacles exist to implementation. Differences between barriers perceived by EPs and SSs need to be addressed to enhance AIS treatment.

Keywords

Stroke Care; Telemedicine; Telestroke; Emergency Medicine; Acute Stroke

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Introduction

Telestroke, real-time audio and visual communication between a stroke specialist (SS) and emergency physicians (EP), has been proposed as a solution to low rt-PA administration rates in acute ischemic stroke (AIS)1,2. The technology is currently used by a number of hospital systems, both within the United States and internationally3,4. Studies show its advantages over traditional telephone consults4. Yet, despite its demonstrated safety and effectiveness in increasing rt-PA administration rates, the technology has not been implemented in many hospitals that stand to benefit.

We characterize and compare the attitudes, beliefs and perceived barriers of SSs and EPs regarding the broader implementation of telestroke.

Materials and Methods

A standardized survey was developed based on a literature review and interviews with community and academic SSs and EPs. As limited research is available regarding physician perceptions of telestroke, literature focusing on telemedicine generally was reviewed5,6.

The survey was piloted at our institution and subsequently distributed nationwide via an online system to 382 SS identified through a review of SSs at academic centers. SSs had 4 weeks to respond to the survey, with a reminder after 2 weeks. The survey was distributed in paper form at the American College of Emergency Physicians (ACEP) conference (Chicago, Il. October 27th-30th 2008) and was available to all physicians attending the conference. Physicians were encouraged to watch a video of an actual telestroke consult to ensure a base level of familiarity with the technology7. The survey required approximately 20 minutes to complete.

All results and statistics were compiled using SPSS (SPSS Inc. version 15.0, Chicago, Il). Non-parametric Mann-Whitney scores were used to compare SSs and EPs to account for the deviations from a normal distribution. p values of < 0.05 were considered significant.

Results

One hundred and thirty five (35%) of the 382 SS surveyed and 226 EPs completed the survey. The average age (yrs) of the SSs and EPs were 47±9 and 41±10 ($p<0.001$). Fifty-five percent of the EPs were attendings > five years, compared to 82% of SSs ($p <0.001$). 10.7% of EPs indicated rural practice. Forty-three (31.6%) of the SS were familiar with telestroke from personal use, as compared to 17 (7.5%) of EPs surveyed ($p<0.001$).

Tables 1-3 summarize the data. SSs spent less time using the internet ($p=0.008$), but indicated more knowledge regarding telemedicine and telestroke ($p<0.001$ and $p=0.010$). Of the SSs, most (89.6% and 87.4% respectively) either strongly agreed or agreed that telestroke will reduce geographical differences in stroke management and that it is superior to telephone consultation. Similarly, the majority of EPs (91.9% and 97.2% respectively) responded optimistically regarding the above items. SSs perceived ambiguity in reimbursement and medical liability as the greatest barriers. EPs reported medical liability and time/cost of installation as the most significant obstacles. EPs perceived patient preference for physical visits ($p<0.001$), management of rt-PA sideeffects($p<0.001$), level of technology ($p=0.005$), and rt-PA not the standard of care for AIS ($p<0.001$) as more significant obstacles. SSs found increased personal work to be a greater barrier than EPs ($p<0.001$).

There were no significant differences between EPs indicating rural versus non rural practices.

Discussion

Telemedicine for remote diagnosis and management of AIS is a feasible solution to low rt-PA administration rates8,9,10. We have shown that telemedicine is viewed favorably by SSs and EPs. However, while SS and EPs agree on the potential of telestroke, concerns regarding medico-legal guidelines, reimbursement, and time/cost of installation impede implementation.

It is important to note that many of these concerns have been informally recognized by leaders in the telestroke field2,11,12. Educating potential users with regards to progress in these areas is critical in increasing physician buy-in.

EPs viewed rt-PA not being the standard-of-care in AIS and management of rt-PA complications to be more significant obstacles than SSs. With regards to these concerns, studies have shown that EPs are less comfortable with rt-PA as the standard of care13. This may be driving the differences observed here.

Limitations of this study included the use of an online survey for SS and paper for EPs. A large non-response rate from SSs, the inability to calculate the non-response rate of EPs, and the use of a convenience sample of EPs at a national conference limits generalizability and may have contributed to a selection bias as those with increased familiarity with telemedicine/telestroke may have been more or less likely to respond. Due to the low percentage of EPs indicating a rural practice in this sample, additional studies regarding this population are warranted. Finally, this survey did not differentiate between web-based and ‘work-station’ models of telestroke.

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Table 1

Technology, Telemedicine,and Telestroke

ITEM	Emergency Physician	Stroke Specialist	P-Value
	Mean (SD) Scale	Mean(SD)	Mann-Whitney U
Daily internet use	2.16 (0.94) 1(< 1 hour) to 4 (> 3 hours)	1.90 (0.93)	0.008
Knowledge of technology is higher than colleagues	2.27 (0.97) 1(strongly disagree) to 4(strongly agree)	2.36 (0.99)	0.365
First in specialty to adopt technologies	2.44 (0.86) 1 (strongly disagree) to 4 (strongly agree)	2.46 (0.90)	0.967
Knowledge of Telemedicine	2.64 (0.71) 1 (no knowledge) to 4 (very knowledgeable)	3.08 (0.73)	<0.001
Knowledge of Telestroke	2.88 (0.78) 1 (no knowledge) to 4 (very knowledgeable)	3.11 (0.72)	0.010

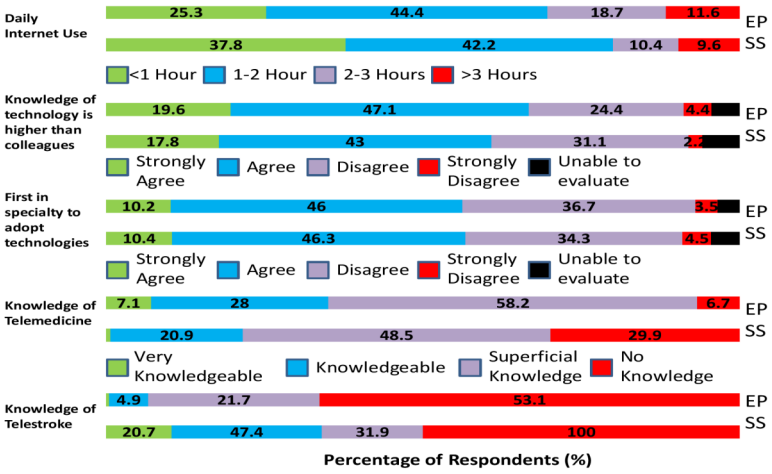

Table 2

Beliefs and Expectations

ITEM	Emergency Physician	Stroke Specialist	P-value
	Mean (SD) 1 (strongly agree) to 4 (strongly disagree)	Mean (SD)	Mann-Whitney U
Improve the diagnosis and treatment of AIS	1.83 (0.58)	1.55 (0.63)	<0.001
More effective than telephone consultation	1.69 (0.54)	1.64 (0.86)	0.040
Reduce geographical differences in regional stroke care	1.85 (0.57)	1.78 (0.87)	0.019
Number of EDs using Telestroke will increase	1.88 (0.52)	1.87 (0.91)	0.061
Telestroke will be useful in research of emerging stroke medications	1.87 (0.54)	2.02 (0.89)	0.376
Telestroke will be useful in physician and community stroke education	1.86 (0.60)	2.17 (0.87)	0.002

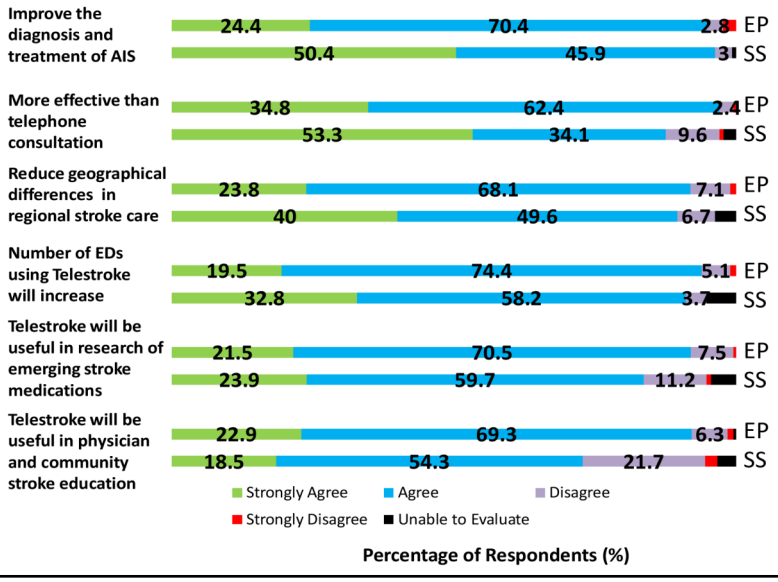

Table 3

Perceived Barriers

Barrier	Emergency Physician	Stroke Specialist	P-Value
	Mean (SD) 1 (very significant barrier) to 5 (no barrier)	Mean (SD)	Mann-Whitney U
Level of technology	2.83 (1.17)	3.13 (0.99)	0.005
Time and cost of installation	2.43 (1.05)	2.36 (1.03)	0.625
Perception that rtPA not considered "standard of care"	2.90 (1.21)	3.43 (1.10)	<0.001
Increased personal work	3.11 (1.12)	2.52 (1.17)	<0.001
Management of rt-PA side-effects	2.50 (1.21)	2.94 (1.10)	<0.001
Medical liability	2.34 (1.16)	2.26 (1.14)	0.528
Patients prefer physical visits	3.00 (1.28)	3.55 (1.08)	<0.001
Safety/Confidentiality of online data	3.53 (1.19)	3.78 (0.99)	0.073
Adequacy of reimbursement	NA	1.96 (0.99)	N/A
Time taken away from care of patients in the ED	3.14 (1.18)	NA	N/A