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Commentary

Stroke Research Disparities in the State of Texas

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Abstract

Objective: Access to care is an important healthcare goal but access to research is also important to patients. We mapped stroke patient volume and stroke clinical research studies in hospitals throughout Texas to identify geographic regions that lack access to stroke research. **Methods:** Texas Department of State Health Service (TDSHS) designated stroke facilities (DSF) was surveyed using a standardized questionnaire via telephone/email to confirm stroke center status and participation in stroke clinical research. Stroke discharge data and stroke volume were obtained from TDSHS for all Texas Hospitals. **Results:** In total, 109/136 (80%) TDSHS DSF responded to the survey. Only 32/109 (29%) of the TDSHS DSF indicated they participated in stroke research, mostly in the 4 major metropolitan areas. We identified 16 non-DSF that have 100-149 annual stroke discharges, and another 21 non-DSF that have ≥ 150 annual stroke discharges. Over half (53%) of the DSF in the state are utilizing telestroke services. **Conclusions:** Most clinical stroke research conducted in Texas occurs the 4 major metropolitan markets. Our findings demonstrate that less than 30% of all stroke centers in Texas participate in clinical research and that over 50% or ~14 million Texans who reside outside of the 4 markets may lack access to enrollment into stroke research studies. Strategies to improve participation in stroke research might include telemedicine linking academic centers in metropolitan centers with community and rural hospitals.

Keywords: Stroke; Telemedicine/Telestroke

Introduction

Many resources have been directed at increasing access to acute stroke care. There has been an increase in the number of certified primary and comprehensive stroke centers throughout the US and utilization of telemedicine also has been shown to increase assess to acute neurological expertise [1]. However, very little is known regarding access to stroke clinical research which is also important to patients and is critical to the rapid and efficient completion of clinical trials, as well was the generalizability of results to the whole population [2]. Creating stroke clinical trial national networks have advanced clinical trial research [3-6], but principally links academic medical centers throughout a country; however, many community and rural hospitals in a region also provide care to substantial numbers of stroke patients and yet little is known about the research opportunities community hospitals offer to stroke patients at a state or regional level. We aimed to gain an understanding of the status of clinical stroke research opportunities in Texas, a state with one of the largest rural populations in the US.

Methods

Texas Department of State Health Services (TDSHS) designated stroke facilities (DSF) were surveyed using a standardized questionnaire via telephone/email conducted (October 1st,2015 to December 31st, 2015) to confirm stroke center status (level I , II, III), presence of a dedicated stroke coordinator, accrediting organization which issued certification (The Joint Commission, Det Norske Vertas, or other), use of telestroke services, and participation in stroke clinical research (defined as enrolling stroke patients into an observational or interventional study). All sites were contacted more than once via telephone and at least once by email. The list of DSF were obtained from the TDSHS website (October 2015) and point of contact information for the facilities were provided by the regional advisory council, if available.

Data regarding stroke discharge data for 2013 and stroke volume using ICD-9 codes for DSF and non-DSF were obtained from the TDSHS Center for Health Statistics. Hospitals were divided into three groups by the volume of stroke discharges, (55-99, 100-149, and ≥ 150). Population data (2010) for census tract were obtained from the US Census Bureau and the Neilson Claritas Demographic Estimation program

Results

Survey results

In total, 109/136 (80%) TDSHS DSFs responded to the survey and one hospital refused to participate. Of the 136 TDSHS DSF, 13 were designated comprehensive level I stroke centers (CSC), 110 were designated primary level II stroke centers (PSC) and 13 were designated support level III stroke centers (SSC) (Table 1). Eighty-five out of the 110 PSCs responded to the survey. A majority (80%) of the PSCs had a dedicated full-time stroke coordinator, over half (50%)

utilized telestroke, and two thirds were affiliated with a comprehensive stroke center. Overall, 29% of stroke centers were participating in clinical stroke research. While all 13 CSCs offered stroke research studies to patients, only 21% of PSCs were involved in stroke clinical research.

	Comprehensive (Level I) Stroke Facility N = 13	Primary (Level I) Stroke Facility N = 110	Support (Level III) Stroke Facility N = 13	Total N = 136
Responded the Survey (% of N)				
Yes	13 (100 %)	85 (77.3%	11 (84.6 9 %)	109 (80.1%)
No	0	25 (22.7%	2 (15.4 %)	27 (19.9%
Organization which issued the certification (% of those responded)				
DNV	5 (38.5 %)	9 (10.6%	0	14 (12.8
TJC	8 (61.5 %)	76 (89.4	1 (9.1 %)	85 (78.0
Didn't answer	0	0	10 (90.9% %)	10 (9.2%
Dedicated Full-Time Stroke Coordinator (% of those responded)				
Yes	13 (100%	68 (80%)	6 (54.5	87 (79.8 %)
No	0	17 (20%)	5 (45.5%	22 (20.2%)
Didn't answer	0	0	0	0
Affiliation with Comprehensive Stroke Facility (% of those responded)				
Yes		57 (67.1%	8 (72.7%	65 (59.6 9 %)
No	N/A	28 (32.9 %)	3 (27.3 %)	31 (28.4%)
Didn't answer		0	0	0
Utilizing Telestroke (% of those responded)				
Yes	13 (100 %)	43 (50.6 %)	2 (18.2 %)	58 (53.2 %)
No	0	42 (49.4%	9 (81.8	51 (46.8 %)
Didn't answer	0	0	0	0
Involved in Stroke Research (% of those responded)				
Yes	13 (100 %)	18 (21.2%	1 (9.1 %)	32 (29.4% %)
No	0	67 (78.8%	10 (90.9 %)	77 (70.6 9 %)
Didn't answer	0	0	0	0

Table 1: Survey results.

Stroke discharge data

In total, there were 599 hospitals in the state of Texas in 2013, with 133/599 designated as stroke facilities. All 13 CSCs had ≥ 150 stroke discharges in 2013 (range 431-1997), and 84% of PSCs had ≥ 150 stroke discharges in 2013 (range 28-1909). Out of the 466 non-DSF in the state of Texas in 2013, there were 16 (3.4%) hospitals that had 100-149 stroke discharges in 2013 and 21 (4.5%) hospitals had ≥ 150 stroke discharges in 2013. These non-stroke centers (466) were not asked whether they participated in stroke clinical research.

Discussion

Advancements in stroke care are dependent on progress in clinical research. Our findings indicate that there is a clear disparity in access to stroke research, especially for patients that reside outside of the 4 major metropolitan regions (Harris, Travis, Bexar, and Tarrant/Dallas Counties) where there is a large concentration of CSCs and PSCs in the state of Texas. Out of the 85 PSCs surveyed, nearly 80% were not participating in clinical stroke research, even though most PSCs (80%) were staffed with a full time stroke coordinator, and two thirds were affiliated with a CSC that is participating in research as a requirement for their certification. Interestingly, over half of the PSCs utilized telestroke for acute stroke care.

There are compelling reasons to address geographic disparities in access to stroke research. As shown in Figure 1, all of the CSCs are clustered in the 4 metro regions and furthermore a significant number of PSCs are also concentrated in the same areas. Studies have shown that recruitment into acute stroke trials are inefficient, and the model of transferring patients from outlying hospitals to urban stroke centers may not be cost-effective or feasible especially In time-dependent interventions [7]. Furthermore, concentrating stroke research into these limited geographic regions can lead to competition among centers for the same pool of patients potentially impeding recruitment due to inadequate pools of research candidates. In addition, patients that are enrolled into trials in the large metro regions are not truly representative of the entire diseased population, yet the results of the trials are often then generalized to all patients [2].

Our findings show that over 50%, or approximately 14 million Texans, reside outside of the 4 major markets and therefore lack access to stroke research. To potentially increase access to stroke research and enhance research recruitment, we identified several non-DSF in the state with substantial stroke discharges (Figure 2). We believe initiatives should be introduced to approach non stroke centers in non-urban environments with high stroke volumes to participate in clinical stroke research. Though community hospitals and even primary stroke centers may lack the expertise and

resources to conduct clinical trials that typically exist at academic medical centers, sponsors of clinical trials choose sites that will conduct the study with high fidelity to the protocol, thereby minimizing protocol violations and adverse events. Partnerships with academic medical centers and remote clinical trial monitoring can address these issues. While many community hospitals may not be able to participate in resource-intensive acute stroke trials, prevention studies, where there has been a surge of industry-sponsored studies, and observational/epidemiological trials, often involve far less resources to implement. In addition, as the NIH-sponsored StrokeNet grows to implement new studies, community hospitals should be better represented to capture more diverse patient populations, especially in areas with populations that typically are underserved in research opportunities [8]. Finally, incentives will need to be better developed to convince community hospitals to participate in clinical stroke trials.

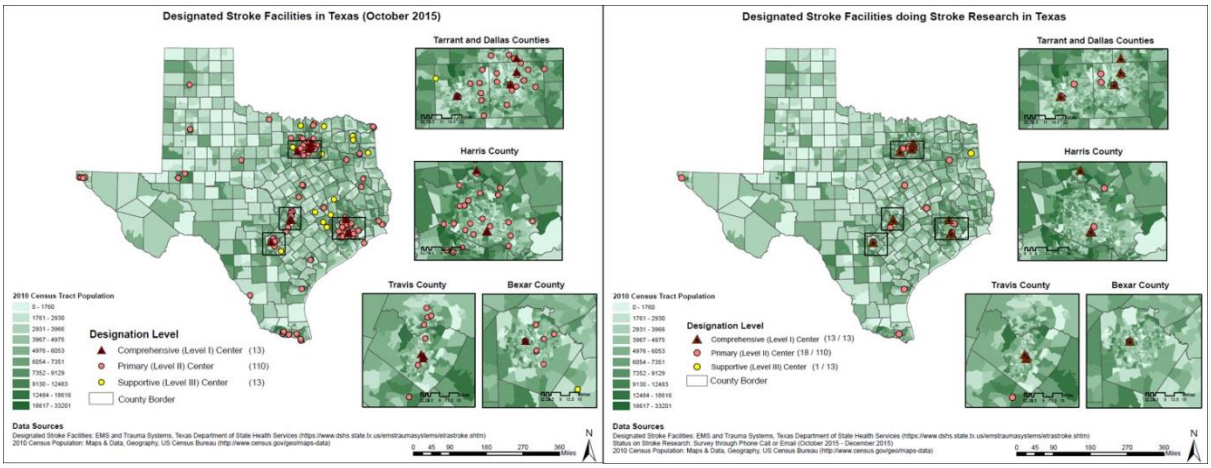

Figure 1: Designated Stroke Facilities in Texas (A) and Designated Stroke Facilities involved in Stroke research (B).

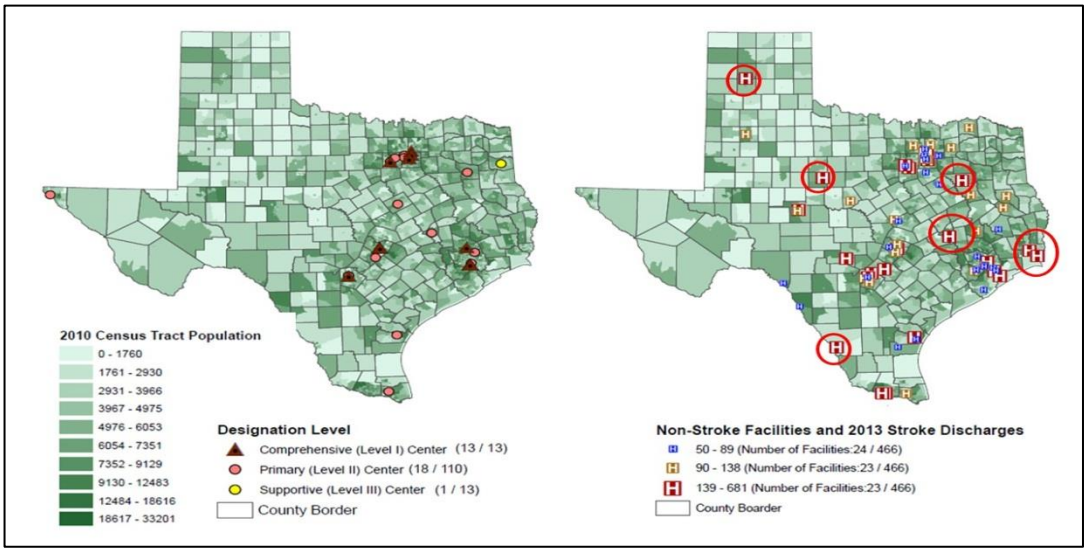

Figure 2: Designated Stroke Facilities involved in Stroke research (A) and Non-Designated Stroke facilities by Stroke Discharge Volume (B).

Another way to expand access to stroke research beyond the CSC reach is to utilize telemedicine/telestroke capabilities. Prior studies have shown that telemedicine can enhance recruitment into acute stroke trial utilizing the drip and ship model and one recent study showed it was safe and feasible to utilized telemedicine to guide remote enrolment of patients into an acute stroke trial at an outlying hospital [9]. Our survey showed that approximately 50% of the PSCs use telestroke, and by partnering with academic centers through telemedicine, it is possible that this model can be used to expand opportunities for participation in stroke research throughout the state of Texas.

We acknowledge limitations of our findings. Stroke discharges are based on 2013 data, and we recognize that designation of stroke centers often change and our methods do not account for changes in designation status. We did not

survey outpatient clinics and therefore our study refers to research opportunities that would be offered to patients hospitalized for stroke. Lastly, 25/110 PSCs did not respond to the survey and we did not contact non-DSF who may be participating in stroke research or be part of a CSC health system/network.

Conflict of Interest

Authors declare that they have no conflict of interest.

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