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Organization of a U.S. County System for Acute Stroke Care

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Introduction: Organized systems of acute stroke care improve delivery. The hospitals of Orange County, CA, the 5th most populous US county (3.1 million over 789 sq miles), met over 5 years in a grass roots effort with Emergency Medical Services to establish Stroke Neurology Receiving Centers (SNRC), which would receive patients from 911 calls for suspected stroke <5 hr old. The system became policy May, 2009, with 9 hospitals designated as SNRC agreeing to provide acute stroke care compliant with AHA guidelines; note that 8/9 were JCAHO stroke center or AHA-GWTG at system inception. The current report describes the first year experience. **Methods:** Each SNRC completed a form for each patient admitted under this system. Missing data were not imputed. **Results:** From April 2009-April 2010, 1,364 patients with suspected stroke < 5 hr old were evaluated at the 9 SNRCs. Primary discharge diagnosis (n=1,110) included ischemic stroke (49%) and hemorrhagic stroke (19%). Mean age was 74 yrs (range 8-103). Time of arrival was unevenly distributed, e.g., 23% of arrivals were between 11am - 2pm. Median NIHSS score was 7 on admit (n=932) and 3 on discharge (n=683). Gender was 55% F / 45% M, with F having higher baseline NIHSS than M (8 vs 7, p < 0.04). Patients were 74% Caucasian, 12% Asian, 9% Hispanic, 1% Black, 4% other; baseline NIHSS differed by ethnicity (p<0.001), being higher in Asian and Hispanic patients. Acute therapy was IV tPA in 110 (20.2% of ischemic strokes) and IA procedure in 42 (7.7%); for both, baseline NIHSS was higher (p<0.0001) among those so treated, e.g., NIHSS=12 with IV tPA therapy vs. 7 no IV tPA. Change in NIHSS score from admit to discharge was larger among those who did, vs. did not, receive IV tPA (6 vs. 1 point, p < 0.0001). Time from door to IV tPA averaged 86 minutes. Death occurred in 11%, and did not vary in relation to IV tPA. There was no significant change over the 12 months in baseline NIHSS, use of IV tPA or IA therapy, death, or time from door to treatment. **Conclusions:** In the first year of this system, we found that women, minorities, and patients receiving acute therapy had more severe strokes. IV tPA, given in >20% of ischemic strokes, significantly reduced impairment with no effect on survival. Important aspects of the program include spoke hospital transfer to SNRC without option of diversion; and SNRC requirements for community outreach, neurosurgical capabilities, and stroke specific rehabilitation programs. A countywide stroke response system, organized among hospitals most of which were organized stroke centers at the start, can provide effective stroke care.

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