Prehospital triage to stroke centres: Is it a solution to the problem?

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The problem

Thrombolytic therapy for acute ischemic stroke is receiving wide attention and has been advocated in emergency medicine literature1 and by the Canadian Stroke Consortium, a national network of neurologists.2 Unfortunately, because of late presentation to the emergency department (ED), most acute stroke patients are ineligible for thrombolytic treatment.3 This situation is primarily caused by the public’s lack of awareness of stroke signs and symptoms,4,5 which leads to delays in presentation to the ED.3,6,7

Current Canadian guidelines recommend administration of thrombolytic therapy within 3 hours of stroke onset.2 Because of this urgency, many facets of prehospital and ED care are being examined to discover ways of reducing time to treatment.8 One broad recommendation is to develop specially trained stroke care teams to respond to patients with apparent acute stroke.9 This has led to an interest in prehospital stroke scales10–12 that would enable paramedics to identify patients with acute stroke, and then pre-notify and triage that patient to the designated stroke centre.13 Prehospital stroke scales are analogous to widely used trauma triage guidelines.

However, little information has been published describing the impact of stroke triage on stroke centres. Accordingly, we sought to evaluate the potential impact of a recently published stroke scale10,11 on our urban emergency medical services (EMS) and ED system, which is considering prehospital triage to stroke "centres of excellence."

The evidence

The recently proposed Cincinnati Prehospital Stroke Scale10,11 (CPSS) is a 3-item scale that was derived from the 15-item National Institutes of Health stroke scale. The items of the CPSS include the presence or absence of facial droop, arm drift and abnormal speech. An abnormality in at least one of these items was found to have a sensitivity of 100% and a specificity of 88% when tested by an emergency physician on a group of patients in which the prevalence of acute stroke was 25%.11 The CPSS is also said to have excellent reliability when used by prehospital personnel and physicians to evaluate ED and neurology service patients.10 In this study, where the prevalence of acute stroke or transient ischemic attack (TIA) was 29%, the scale was 63% sensitive and 88% specific. If these 2 studies provide a valid assessment of CPSS diagnostic parameters, then its actual sensitivity and specificity are likely to be approximately 80% and 88% respectively.
The assumptions

The prevalence of acute stroke in prehospital patients is far lower than 25% to 29% and may be as low as 0.7%. Our assumption is that the prevalence of acute stroke in our EMS patients is roughly 1%. Since our EMS system responds to 125,000 emergency calls per year, EMS personnel would be expected to transport approximately 1250 acute stroke patients.

Not every EMS patient should be the subject of a pre-hospital stroke scale. Our EMS system uses the Medical Priority Dispatch System (MPDS), which requires emergency medical dispatchers to assign patients into broad diagnostic and chief complaint categories. It was the consensus of 2 EMS physicians and 3 paramedics that acute stroke patients are likely to fall into the following MPDS categories: convulsions/seizures, diabetic problems, headache, sick person, stroke, unconsciousness/fainting, or unknown problem. These groups account for 43,000 calls per year and would include most of the patients requiring a stroke tri-age scale assessment. If 1250 of 43,000 transported patients have acute stroke, then stroke prevalence in this group is 3%. 