Community Stroke Education Using Mass Media
Past Results and Future Implications

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See related article, pages 2115–2122.

Delay in presentation to the emergency department (ED) outside of the various treatment time windows for reperfusion therapy remains a significant barrier in the treatment of acute stroke patients. Previous studies have shown that although the cause of this delay is multifactorial, patient awareness of stroke signs and symptoms, recognition of the need to seek urgent treatment, and transport by emergency medical services have all been associated with earlier ED presentation time. Furthermore, early recognition of a stroke by others, such as family members, friends, and bystanders, also increases the probability of earlier presentation for treatment. Indeed, one study found that it is these individuals who are most likely to call 911 for a stroke victim.

In light of these findings, a few groups have implemented and reported the results of community stroke education campaigns using the mass media (ie, television and newspaper ads, radio announcements, billboards, and other forms of printed media) with the aim of reaching both individuals at high risk for stroke and others who may be in the presence of a victim during stroke onset. The majority of these previous studies found a positive impact from these campaigns on the public’s knowledge of factors associated with earlier ED presentation: stroke signs, symptoms, and risk factors. However, only one study, the TLL Temple Foundation Stroke Project, reported the impact of these programs on actual behavior. Specifically, in addition to increasing the public’s knowledge of stroke, of interest is the extent to which these programs are associated with an increase in stroke patients actually arriving at the ED earlier after symptom onset, and also a concomitant increase in the number of patients treated with reperfusion therapy.

The TLL Temple Foundation Stroke Project’s primary outcome was the proportion of stroke patients treated with intravenous tissue plasminogen activator. A secondary outcome was a reduction in delay time from symptom onset to presentation for treatment. This study found that the rate of intravenous tissue plasminogen activator treatments increased from 2% to 9% (P<0.02) among ischemic stroke patients in the intervention community, but only increased from 0.71% to 0.86% (P=1.00) in the comparison community not exposed to the project. Furthermore, this increase was sustained in a long term follow-up study in which intravenous tissue plasminogen activator treatments were received by 11% of ischemic stroke patients in the intervention community 6 months after formal intervention. The proportion of patients in the intervention community presenting within 2 hours of symptom onset also increased from a baseline of 28% to 32%. However, this result cannot be attributed to the campaign alone, because this proportion also increased in the control community.

The TLL Temple Foundation Stroke Project did not report any results directly related to whether the public’s knowledge was impacted by the project. Additionally, the study also included a provider education component that could have, in part, explained the increase in the primary outcome. The authors surmised that the professional education component probably had the largest impact on the results. Consequently, the current study by Hodgson et al represents a seminal contribution to the literature by providing data on the impact of a community stroke education program using mass media on both knowledge and behavior. It also provides results on the impact of such a campaign in the absence of a targeted professional education component.

Building on previous work in the same setting by Silver et al, these authors found a significant increase in both knowledge (ability to name ≥2 stroke warning signs) and behavior (presentation to the ED for stroke) from their mass media campaign. Specifically, there was a consistent increase in the proportion of respondents able to mention at least 2 stroke warning signs during all telephone polls except the last one, which was conducted after a 5-month media blackout period (Table 2). A similar trend in mean number of ED visits for stroke (in total, within 5 hours of “last seen normal,” and within 2.5 hours) over the 31-month study period is shown in Table 1, although this same trend was not observed for TIA patients. Unfortunately, the impact of the campaign on the frequency of reperfusion treatments was not reported and cannot be compared with the TLL Temple Foundation Stroke Project. The absence of a control or comparison community also increases the possibility of other threats to the conclusions of the study, and is arguably the most important limitation of the study.

Regardless of this limitation, perhaps the most important finding of the current study is the suggestion that community stroke education programs may need to be delivered in a periodic, recurring fashion to be effective in the long-term. For example, the greatest impact of the community stroke education program on ED visits was realized over time, with
the variable year explaining a significant portion of the variance in ED visits. However, the presence of the campaign in the community was also found to be a significant, albeit much smaller, predictor of ED visits for stroke even after controlling for the influence of year. Additionally, between telephone survey polls 5 (cessation of campaign 2) and 6 (5 month blackout period), knowledge of stroke warning signs declined in all groups regardless of gender, age, or education level. Figure 1 also shows a trend that suggests a similar depression in the number of ED visits (total, within 5 hours, and within 2.5 hours) during this same period, although the increasing trend seen in January 2006 is inexplicable and appears to be due, in part, to an increase in TIA visits. Interestingly, in the TLL Temple Foundation Study Project, the proportion of ischemic stroke patients who presented within 2 hours declined from 31.7% to 28.6% in the intervention community in the 6 month period after cessation of the campaign.12 These results lend credence to the notion that repeated, nonconsecutive exposures to the message over time may yield the best results.

The fact that the campaign had the greatest independent effect on TIA visits (explaining almost 30% of the variance in these visits independent of year) is interesting and merits further investigation. If these campaigns are found to encourage those experiencing TIAs to seek treatment in the ED, this situation could increase opportunities to catch the disease process earlier and initiate preventative measures.

In summary, an amalgamation of the results of these community stroke education programs provides evidence that programs using mass media delivered in a periodic, recurring format can change both the knowledge and behavior of the public. Such changes may make it possible to deliver more efficacious treatments to patients presenting within the reperfusion treatment time windows. In some areas these community educational efforts may be augmented by a concomitant professional education component. Future studies in other settings should confirm these results and specifically examine the importability of these approaches to smaller communities that may not have the same level of resources to purchase some of the more expensive mass media elements.

Disclosures

None.

References


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