

Tissue Plasminogen Activator in Israel: Are We There Yet?

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Stroke is the most common neurological emergency. The holy grail of modern acute stroke therapy is to reduce ischemic injury-related morbidity and mortality. This may be achieved by rapid restoration of tissue perfusion. This notion is supported by numerous studies that showed tight linkage between early reperfusion and reduction of morbidity and mortality in stroke victims [1,2]. The article by Gur and co-researchers in this issue of *IMAJ* [3] provides a welcome emphasis on stroke treatment in Israel. The authors compare their initial experience with systemic administration of tissue plasminogen activator to that obtained at another Israeli center and also to that observed in a multi-national stroke registry. Reassuringly, most of the data are comparable among all three sources, suggesting that stroke patients and stroke treatment in Israel are similar in other western countries.

Their report does however raise several issues that merit further discussion on a national level. First, the fact that only 4% of stroke patients in the study arrived early enough to be treated with tPA highlights the need for educating the public on signs of stroke and the importance of immediate medical intervention. The fraction of tPA-treated patients needs to be much higher in order to reduce the

enormous societal burden and costs of stroke-related disability.

Second, this study highlights the need to improve the in-hospital infrastructure in Israeli medical centers to ensure rapid diagnosis and treatment. The present study indicates that the time from presentation at the emergency department to the actual time of drug administration is longer in Israeli centers than in the multi-national stroke registry. Because earlier treatment results in better outcome due to salvage of larger brain areas at peril, adequate measures to circumvent the obstacles and to ensure rapid administration of tPA need to be implemented locally in each medical center. The paper by Gur et al. thus uncovers local current limitations in stroke therapy. It is crucial to increase awareness among medical professionals and emergency department staff in particular regarding the urgency in stroke therapy, to generate immediate availability of neuroimaging in acute stroke patients, to form dedicated stroke team, and to establish dedicated stroke units. Such units have been established in only a handful of centers in Israel due to the lack of government support.

The third message from the paper by Gur et al. is that, ultimately, systemic tPA is but one of the multiple tools that exist today in our battle against stroke. The authors show that patients with large hemispheric stroke secondary to internal carotid or middle cerebral artery occlusion have lower chances of reperfusing after systemic tPA. These patients, as well as patients with acute basilar artery occlusion, may benefit more from emergent catheterization for arterial intervention, termed multi-modal endovascular reperfusion

therapy. Since patients presenting early are given systemic tPA, then MMRT is usually reserved for patients who arrive later. However, some preliminary evidence now suggests that MMRT can be applied early in patients with acute stroke and the overall results are better [4]. Indeed, our own experience indicates that MMRT is feasible and effective in both basilar and extensive anterior circulation strokes [5,6].

In conclusion, our goal should continue to be one of adjusting the best treatment option for each patient individually. On the local perspective, decision-making algorithms and stroke protocols are implemented in many medical centers for that effect and are a necessary part of good medical care for stroke victims. An efficient and supportive infrastructure in each medical center that treats stroke victims is a prerequisite for reducing stroke-related morbidity and mortality. Nationally, programs to educate the public about stroke and its therapy and to reduce time from stroke onset to treatment must be implemented so that we can increase the percentage of treated patients and reduce the national costs of stroke care. Plans for adequate stroke care across the nation, including the establishment of stroke units, need to be generated and mandated by the government. And so the answer to the question in this Editorial's title is sadly a "no," but we are getting closer.

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