Intravenous Streptokinase for Treatment of Acute Myocardial Infarction in Small Hospitals

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Streptokinase has been available for the treatment of thrombolysis in acute mycocardial infarction for over 25 years.[1,2] The efficacy of streptokinase has been documented most convincingly when it has been infused by the intracoronary route,[3–8] but intravenous infusion has also been shown to be effective.[9–17] Although the drug is effective by either route if given within six hours after onset of the coronary event, the sooner the drug is adminstered after the onset of symptoms, the better the outcome.[14]

For patients in rural areas, transfer to a tertiary institution with cardiac catheterization facilities is necessary for intracoronary infusion, which may not be possible before the six-hour therapeutic "window" has passed.

In contrast, intravenous administration of streptokinase only requires access to a peripheral vein, the ability to monitor the patient for bleeding or overanticoagulation, a thorough knowledge of the actions and contraindications of streptokinase, and a protocol for its use. Simple protocols are available[10]; moreover, the safety and efficacy of streptokinase in the rural setting has been established in at least one study.[17] Candidates for intravenous streptokinase generally include those with onset of symptoms within six hours and acute ST-segment elevation characteristic of myocardial infarction. The drug is contraindicated in patients currently on oral anticoagulants or with recent surgery or trauma (including cardiopulmonary resuscitation), recent bleeding or stroke, severe hypertension, known bleeding disorder, or a known adverse reaction to streptokinase. Heparin is generally infused for 48 or more hours after the dose of streptokinase, and the partial thromboplastin time must be monitored during the administration of both drugs. Thus, most patients presenting to the hospital with acute myocardial infarction would qualify as candidates for thrombolysis with streptokinase. One might expect, therefore, that the use of intravenous streptokinase would have rapidly become the standard of care in the small community hospital. The study reported here was designed to assess the extent to which streptokinase has become a therapy for acute myocardial infarction in this setting.

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METHODS

A questionnaire was mailed to all 76 primary care physicians (family physicians, general practitioners, and general internists) practicing in nine counties in southern Alabama. These physicians use 16 hospitals ranging in size from 30 to 99 beds (mean, 58 beds); all hospitals are equipped to manage patients with acute myocardial infarction.

The questionnaire inquired about the physicians' management of acute myocardial infarction, with particular reference to their use of intravenous streptokinase.

RESULTS

Of the 76 questionnaires mailed, 52 were returned, for a 68 percent return rate. In Table 1 are shown the sample and response rates by specialty, and in Table 2, the responses to the questions on the questionnaire. Nearly all responding physicians perform initial evaluation and management of patients with acute myocardial infarction, and most (90 percent) manage at least some of these patients throughout their hospitalization. Of those 47 who continue management, about one half do so with uncomplicated cases only. Thirty-six respondents answered the question concerning their consultants' use of intravenous streptokinase, and of these, 30 (83 percent) responded positively. This finding contrasts with the finding that of the 47 physicians who themselves continue management of acute myocardial infarction, only 21 (45 percent) have ever used streptokinase. The differences between specialties are not significant (Table 3). Two thirds of these physicians are affiliated with hospitals having a protocol for

TABLE 1. DESCRIPTION OF PHYSICIAN SAMPLE BY SPECIALTY

Specialty	Questionnaires Mailed	Questionnaires Returned	Response Rate
Family physicians	33	28	85
General practitioners	34	19	56
General internists	9	5	56
Total	76	52	68

TABLE 2. USE OF INTRAVENOUS STREPTOKINASE IN ACUTE MYOCARDIAL INFARCTION (n = 52)

Protocol	Yes No. (%)	No No. (%)	Total No. (%)
Do you provide initial management for patients with acute myocardial infarction?	51 (100)	0 (0)	51 (100)
Do you continue management of these patients throughout their hospitalization?	47 (90)	5 (10)	52 (100)
Do you manage complicated and uncomplicated myocardial infarctions?	25 (52)	23 (48)	48 (100)
If you use a consultant, does he or she use intravenous streptokinase?	30 (83)	6 (17)	36 (100)
Have you ever used intravenous streptokinase for myocardial infarction?	21 (45)	26 (55)	47 (100)
Does your hospital have a protocol for intravenous streptokinase?	33 (66)	17 (34)	50 (100)

intravenous streptokinase, whereas one third practice in hospitals where such a protocol is not established.

DISCUSSION

These results indicate that treatment with intravenous streptokinase has found its way into the smaller hospital setting, but not to the extent that its advantages and indications would suggest is appropriate. While nearly all the primary physicians' consultants are experienced in the use of intravenous streptokinase, less than one half of the primary physicians themselves are experienced with its use, and one third of them practice in hospitals where protocol for the use of this drug is unavailable. Why is this apparently efficacious drug neglected by such a sizable percentage of rural physicians?

TABLE 3. USE OF INTRAVENOUS STREPTOKINASE BY SPECIALTY

Respondent	Number of Respondents Who Manage Patients with Acute Myocardial Infarction	Number of Respondents Who Use Intravenous Streptokinase No. (%)
Family physicians	26	12 (46)
General practitioners	16	6 (38)
General internists	5	3 (60)

One reason is lack of knowledge about and experience with the drug. Most of the literature on the efficacy of streptokinase is recent and was not available when most of the physicians in the field today were in medical school or residency training. The use of this drug, therefore, should be the focus of continuing medical education efforts made available to rural physicians.

There may be a more fundamental reason. While this drug seems to be efficacious in the hands of research-oriented subspecialists based in tertiary care referral centers, its efficacy is less certain in the rural setting. The generalizability of the studies done so far is limited. Until more studies on intravenous streptokinase for the treatment of acute myocardial infarction are done in the rural setting by primary care physicians, the present findings should be interpreted with caution. If and when such results become available, the use of this modality may become more universal.

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