

Report

Thrombolytic agents in district hospitals

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Introduction

Myocardial infarction (MI) represents a major health and social problem in developing countries. Many cardiologists and internists have realized the danger of MI in developing countries and describe distinct features that differentiate it from MI in industrialized countries [1]. MI in developing countries may attack at any age, it is more common in middle-aged people, it is the result of augmentation of the well known risk factors, it is extremely dangerous in the first hour and it rarely, if ever, is mild. In most cases, MI leads to sudden death or leaves disabling complications, such as cardiomyopathy, ventricular aneurysm, reinfarction and occlusive vascular diseases in the brain, the limbs and viscerae [2]. Thus, there is an urgent need for all levels of the health care community to cooperate in decreasing the effects of MI.

Main medical developments

There have been many developments regarding MI in the past 20 years. At the primary prevention level, physicians have recognized the role of risk factors [3] and

they believe that they can predict acute myocardial infarction (AMI) in high risk individuals [4]. They believe also that they are able to delay MI or even to prevent it [5] if the individual at risk is given periodic medical exams, some of which are very simple, but others, however, are complicated or even dangerous, expensive and need a high level of technology and training.

At the treatment level, there have been developments in AMI management in the first hour. Most of them are conservative, such as the use of thrombolytic agents (TAs), anticoagulants, antiarrhythmias, vasodilators and myocardial conservatives. Others are aggressive, such as the use of percutaneous transluminal intracoronary balloons, early (emergency) bypass surgery and intra-aortic counterpulsation balloons. However, the crucial requirement to success in any of these methods is their early application. Success rates depend on the shortness of the period between the beginning of symptoms and the beginning of treatment with TAs [6]. In this regard, developing countries are faced with problems. Generally, they cannot afford cardiac laboratories and they cannot provide the appropriate instruments, except in very limited academic and central medical centres.

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Statistical data

Some investigators consider TAs to be the most important achievement in cardiology in this century [7]. Their opinion is based on the results of treatment with TAs which show the following:

- TAs reduce 50% to 90% of AMI mortality if they are administered in the first hour of symptoms [8].
- TAs reduce 30% of AMI mortality if they are administered within the first 6 hours of symptoms [9].
- TAs reduce 15% of AMI mortality if they are administered within 6 to 12 hours of symptoms [10].
- TAs reduce mortality in AMI patients to between 2% and 10%, whereas mortality in AMI patients not treated with TAs remains between 15% and 30% [8].
- 60% of AMI patients are eligible for treatment with TAs [12].
- In the United Kingdom, 85% of AMI patients receive TAs in hospital [12].
- Only 30% of AMI patients in the United States of America receive TAs in hospital [13].

Direct benefits of TAs

- They completely relieve chest pain [14].
- They diminish electrocardiogram changes [15].
- They decrease the levels of specific myocardial enzymes, especially MB creatinine kinase [16].
- They decrease the incidence of non-fatal complications such as reinfarction, congestive heart failure and shock [17].
- They decrease mortality [18].

The main risk of TAs is the increasing incidence of haemorrhages [19], especially

from cannulas and in the central nervous system.

Conclusions

Time is crucial for the use of TAs [20]. This time can be divided into two intervals:

- from symptoms beginning to hospital arrival
- from hospital arrival to the beginning of treatment with TAs.

To achieve good results, this period should be shortened as much as possible [21]. This requires the following:

- Ensuring the availability of TAs in intensive care units (ICUs) and emergency rooms (ERs).
- Authorizing medical staff in ICUs or ERs to begin treatment with TAs according to a clear, simple and acceptable protocol.
- Implementing an information campaign to medical staff to direct their patients to the nearest ER or ICU as soon as possible if they suspect they have AMI.
- Using the mass media to inform the population to go as quickly as possible to an ER or ICU the moment they feel chest pain, and providing fast and safe ambulances.
- Improving the quality of medical services in ICUs and ERs and recruiting cardiologists to look after patients there. This is important in order to make the decision to begin treatment with TAs more accurate.
- Providing ICUs and ERs with the instruments and drugs necessary for the management of any complications related to treatment with TAs, such as rapid-acting cortisone injections, protamine sulfate

injections, fresh frozen plasma and fresh blood.

- Establishing a special registry system for MI cases, particularly those who have TA therapy. This requires provid-

ing ICUs and ERs with questionnaires that physicians have to complete regularly.

- Providing ICUs and ERs with informed consent forms.

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