

AUDIT

An evaluation of the results of media and educational campaigns designed to shorten the time taken by patients with acute myocardial infarction to decide to go to hospital

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Abstract

Objective—To describe the benefits and pitfalls of educational campaigns designed to reduce the delay between the onset of acute myocardial infarction (AMI) and its treatment.

Methods—All seven educational campaigns reported between 1982 and 1994 were evaluated.

Results—The impact on delay time ranged from a reduction of patient decision time by 35% to no reduction. One study reported a sustained reduction that resulted in the delay time being halved during the three years after the campaign. The use of ambulances did not increase. Only one study reported that survival was unaffected. There was a temporary increase in the numbers of patients admitted to the emergency department with non-cardiac chest pain in the initial phase of educational campaigns.

Conclusion—The challenge of shortening the delay between the onset of infarction and the start of treatment remains. The campaigns so far have not been proved to be worthwhile and it is not certain that further campaigns will do better. New media campaigns should be run to establish whether a different type of message is more likely to change the behaviour of people in this life-threatening situation.

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Keywords: delay; patient education; myocardial infarction.

The delay between the onset of symptoms and the start of treatment has become a critical factor in the attempt to limit cardiac muscle damage and thus improve outcome in acute myocardial infarction (AMI). New treatment regimens for AMI developed during the past decade, such as thrombolysis,¹⁻³ β blockers,⁴⁻⁶ and percutaneous transluminal coronary angioplasty (PTCA),⁷⁻⁹ provide a rationale for reducing delay.

It is clear that the interval between the onset of symptoms and the start of intervention, particularly thrombolysis, is directly related to the outcome. The earlier such intervention is started, the better is the prognosis.^{1 10}

The other crucial reason for shortening the delays in suspected AMI is the fact that most deaths from ischaemic heart disease occur outside hospital, mainly as a result of ventricular fibrillation.¹¹⁻¹⁴ Many lives could be saved if patients had medical treatment to prevent the onset of a life-threatening arrhythmia.

We have examined the opportunities that there are to shorten the time taken for the patient to decide to go to hospital and the consequences of educational campaigns.

Methods

PUBLISHED REPORTS

We used the terms myocardial infarction, patient education, campaign, and delay time to search Medline for articles published in English from 1965-1995. We found three media campaigns. However, we were also aware of five further educational campaigns, which were published as abstracts at the European Congress of Cardiology 1990²⁸ and at the American Heart Association 1993³¹ or as original articles in the *American Journal of Cardiology* 1993,²⁹ *Canadian Journal of Public Health* 1984,²⁵ and *Annals of Emergency Medicine* 1994.³²

METHODS USED TO EVALUATE THE CAMPAIGNS

The following aspects of a potential influence of media campaigns were evaluated:

- Impact on delay time
- Impact on the use of ambulance
- Awareness of campaigns among patients and in the community
- Reaction to media campaigns in the community
- Impact on the number of patients admitted to the emergency department with acute chest pain, on the number of patients admitted to hospital with suspected AMI and on the number of patients admitted to hospital with confirmed AMI
- Impact on mortality and morbidity from AMI

COMPONENTS OF DELAY BETWEEN ONSET OF SYMPTOMS AND START OF TREATMENT

Delay time has prehospital^{15 16} and hospital phases.^{17 18} Prehospital delay time can be divided into the patient decision time and the transport time. The transport time is influenced by various local factors including the distance

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to hospital. Some of these factors are difficult to influence. The patient's decision time can be affected by cultural factors, educational factors, age, and gender^{19,20} and in most cases it accounts for much of the prehospital delay.^{21,22}

The in-hospital delay is also influenced by local factors such as the site at which treatment starts,²³ assignment of treatment responsibility, and other factors. This overview will focus mainly on attempts to reduce patients decision time and the results of such efforts.

TARGET GROUPS

The target groups are either patients or patients and relatives with ischaemic heart disease or the whole community. Though there are few published reports on the education of patients and their relatives, experience of education of the public by mass media campaigns is growing.²⁴⁻³⁰

RATIONALE

Is it possible to change a person's behaviour in a life-threatening situation? Experiences from patients with a previous history of myocardial infarction suggest that it is not.^{15,33} They have a particularly long delay time. Furthermore, it may be that such efforts frighten people more than they educate them and thus do more harm than good.

IMPACT OF MEDIA CAMPAIGNS ON DELAY DURING SHORT-TERM FOLLOW UP

The earliest campaign, conducted in Nottingham, England, was an educational programme to encourage early reporting of symptoms in over 13 000 men and women over 40 registered with three general medical practices. Patients were instructed to telephone a special hospital number if they developed chest pain lasting more than 10 minutes. Patients from the three campaign practices reported chest pain earlier than patients in 10 comparison practices. There was a lower percentage of definite and probable AMIs among the calls received by the special telephone line than calls received by the patients' own doctors, implying that patients did call earlier but were more likely to call their own physician rather than the special number. The study included a comparison group which was selected by convenience rather than through a randomised design.

Since the Nottingham study²⁴ there have been at least eight media campaigns designed to educate the public about the dangers of acute chest pain and the possibility of improving outcomes if treatment is started early.

The first of these campaigns called Signals and Action was run in Halifax, Canada. It was a short term campaign with a pre-test period of four weeks, a campaign period of eight weeks, and a post-test period of one week, three months after the end of the campaign. During the pre-test period 16% of patients with acute chest pain were admitted to hospital within two hours after onset of chest pain as compared with 32% during the campaign ($P < 0.05$). In the post-test period, 29% presented within two hours.²⁵

In the Göteborg Heart Pain 90 000 campaign, a one-year media campaign was preceded by a 21-month control period. The median delay time between onset of pain and arrival in hospital among AMI patients fell from 3 hours during the control period to 2 hours 20 min during the year of the campaign ($P < 0.001$).²⁶

In Seattle, a two month educational campaign was evaluated by comparing a pre-test period of 4.5 months and a post-test period of the same duration. The campaign did not significantly shorten patient delay in seeking care (pre-message median delay of 2.6 hours; post-message median delay of 2.3 hours).²⁷

A media campaign in the city of Ludwigshafen in Germany was more successful.²⁸ During a pre-test period of 4 months, 42% of patients with acute chest pain arrived at hospital within 2 hours of the onset of pain as compared with 82% during the campaign ($P < 0.05$). The median delay decreased from 4.0 hours before the campaign to 3.2 hours during it.

In a two year media campaign in Jacksonville, Illinois, the delay after the campaign did not differ significantly from that before it.²⁹

The National Heart Week in Australia took place in 1989. Three surveys of coronary care units in various parts of Australia were performed, six months before the campaign, one month before it, and six months after it. The mean delay between the onset of symptoms and arrival at hospital remained similar during these three periods; 8.9 hours, 8.6 hours, and 8.3, hours respectively.³⁰

Under the slogan "Heart attack? Every minute counts! Call 144", a one-year media campaign was performed in Geneva in Switzerland. In chest pain patients, the median delay was reduced from 3 hours 0 minutes before the campaign to 2 hours 40 minutes during it.³¹ The table summarises these campaigns.

Results of various campaigns in terms of impact on delay time between onset of symptoms and arrival in hospital

Country	Year	Duration*	Number of patients		Delay time	
			Control	Campaign	Control	Campaign
Canada	1983	2 mnth	101	41	≤ 2h (16%)‡	(29%)‡
USA	1987	2 mnth	401	489	Med d 2.6h	2.3h
Germany	1989	6 mnth	203	302	Med d 4h	3.2h
Sweden	1988	1 yr	768	496	Med d 3h	2h 20 min
Australia	1989	1 wk	221	253	Med d 1h†	Med d 1h
USA	1989	2 yr	66	67	Med d 1h 43 min	Med d 1h 52 min
Switzerland	1992	1 yr	1075	640	Med d 3h	Med d 2h 40 min

*Duration of campaign.

†Time to seek help.

‡Percentage of patients who arrived in hospital less than 2 hours after onset of pain.

Med d, median delay.

Comment

The experiences of different media campaigns in industrialised countries provide conflicting results for impact on delay time in AMI patients. The reasons for these differences may vary. The delay time was short before the start of the campaigns in Seattle and Jacksonville, making it less likely to be reduced still further. In other campaigns there was greater potential for reduction.

LONG-TERM IMPACT ON DELAY TIME

In only one of the campaigns was the impact on long-term follow up evaluated.³⁴ In the Göteborg campaign, the median delay remained significantly lower in the three years after the campaign ended (2 hours 20 min compared with 3 hours before it started).

IMPACT ON THE AMBULANCE USE

There is no evidence that media campaigns increase ambulance use.^{26 35} The use of ambulances in AMI appears to have remained stable over the past two decades.³⁶

IMPACT ON INFARCT SIZE

Only one of the campaigns evaluated the impact on estimated infarct size. Infarct size was limited by shortening the delay.³⁷

IMPACT ON THE PROGNOSIS

The only campaign which evaluated the effect on mortality³⁷ found no difference in mortality during the year of the campaign compared with the previous period. However, both before and during the campaign, the use of thrombolytic agents was low compared with the current era.

WHAT HAPPENS AT THE DISPATCH CENTRE?

A recent campaign in Seattle, showed that the use of the 911 emergency number increased during the campaign, but rapidly diminished after its completion.³² Similarly, the number of patients calling the central switchboard because of acute chest pain increased during the campaign in Geneva.³¹

WHAT HAPPENS IN THE EMERGENCY DEPARTMENT?

The number of patients with acute chest pain attending the emergency department increases considerably when media campaigns which aim to reduce delays for patients are being run.^{31 32 38} This increase consists mainly of patients with chest pain of non-cardiac origin,³⁸ but also of patients with unstable angina pectoris and AMI³¹ and appears early in the campaign but then diminishes rapidly despite the continuation of the media campaign.^{31 38} During the one-year media campaign in Göteborg, the number of patients who came to the emergency department with acute chest pain increased by 9% compared with the year before.³⁸

DOES THE NUMBER OF PATIENTS ADMITTED TO HOSPITAL WITH SUSPECTED OR CONFIRMED AMI INCREASE DURING MEDIA CAMPAIGNS?

In the recent Seattle campaign, there was a

considerable increase in the number of patients admitted to hospital with suspected AMI during the campaign.³² This increase declined soon after the campaign was completed. However, the number of patients with confirmed AMI did not appear to increase during the campaign.³² In the Göteborg campaign, the number of patients admitted to hospital with suspected AMI increased 5% during the year of the campaign and the number of patients with confirmed AMI increased moderately and non-significantly (6%).³⁸ In Geneva, the number of patients admitted to hospital with AMI or unstable angina increased 27% during the first six months of the campaign.³¹

WHAT PROPORTION OF PEOPLE IN THE COMMUNITY CAN WE REACH WITH MEDIA CAMPAIGNS DEALING WITH ACUTE CHEST PAIN?

The various campaigns have similar findings. It seems that about two thirds of the population will become aware of the message.^{25 27 31 39} Younger people are aware of the message more frequently than the elderly.³⁹ Men and women are equally aware.³⁹ Patients with a history of cardiovascular disease are aware of the message to a similar degree as those without.³⁹

HOW MUCH OF THE MESSAGE DO PEOPLE REMEMBER?

Telephone interviews during the Göteborg campaign found a fifth of those interviewed spontaneously remember the complete campaign message (that is, chest pain for more than 15 minutes, dial 90 000 immediately for ambulance transport to hospital).³⁹

COMMUNITY REACTION TO CAMPAIGNS ABOUT THE DANGER OF CHEST PAIN?

In the Göteborg media campaign, most people in the community reacted positively (83%). In fact, only 1% regarded the campaign as something frightening.³⁹

HOW MUCH DO THE CAMPAIGNS COST?

In Jacksonville with a total population of 55 000 the cost of the two year campaign was \$10 000 for the first year while the cost of the second year was totally sponsored.

In the two short-term campaigns in King County, Seattle with a population of 1 million, the cost was \$140 000²⁶ and \$245 000³² respectively.

In the one year campaign in Göteborg with a population of 450 000, the total cost was \$400 000, which includes \$285 000 sponsorship, giving a net cost of \$115 000.

Discussion

A weakness of this overview is the absence of details concerning the content of the programmes and the media involved. Doubtless the media chosen varied between studies and with the intensity of the programme, the details available were sometimes too limited to allow further consideration.

In some areas, media campaigns reduced

delays in AMI. It may be that the impact on patient decision time is even larger than the reported effect on total delay time, because the latter also included transport time. Thus in the Göteborg campaign we found that the total delay between onset of pain and admission to hospital was reduced by 22% whereas patient decision time was reduced by 35%.²⁶ However, there are currently no reports to indicate that media campaigns improve survival. In the only study in which this issue was addressed, the use of thrombolytic agents was very low during the campaign.³⁷ Media campaigns about acute chest pain caused a temporary increase in the number of patients coming to the emergency departments with non-cardiac acute chest pain, as well as in the number of calls to emergency centres, but the number of patients admitted to hospital with AMI did not increase or increased only moderately.

ARE THERE OTHER WAYS OF REDUCING DELAYS IN AMI?

Several studies have been performed to evaluate the impact of prehospital thrombolysis in AMI on survival as compared with thrombolysis initiated in hospital.⁴⁰⁻⁴⁴ This approach further reduced delay times. Summary of the individual results from these trials in a meta-analysis found that pre-hospital thrombolysis significantly increases survival.⁴³

Although prehospital delay is the major component of the total delay between the onset of AMI symptoms and the start of treatment, the hospital procedure time is often unnecessarily long.^{18,19} Previous studies have reported that it is possible to shorten the hospital procedure time considerably.^{23,45-48} In many community hospitals, the introduction of emergency chest pain rooms appears to be one solution to this problem.⁴⁹ Another approach is to transport the patients directly from the ambulance to the coronary care unit, bypassing the emergency department.

FUTURE ASPECTS

Shortening the delay between the onset of infarction and the start of treatment remains a challenge. The campaigns performed so far have not really proved to be worthwhile and it is not certain that further campaigns will do better. New media campaigns should be run to establish whether a different type of message is more likely to change the behaviour of people in this life-threatening situation. The aim is to increase the prehospital initiation of treatment for AMI and reduce the within hospital delay.

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