

# Knowledge about Acute Myocardial Infarction (AMI) and attitudes to medical care seeking—A comparison between patients and the general public

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## ABSTRACT

**Background:** Patients with acute myocardial infarction often have long decision times before seeking medical care. The decision time is influenced by knowledge of AMI-symptoms, psychological factors and the response of people near the patient to the symptoms. **Aim:** To investigate and compare the knowledge of AMI, intended actions in response to AMI-symptoms and attitudes toward seeking medical care of patients and the general public. **Method:** This was a multi-centre study with descriptive and comparative design, using questionnaires as an instrument. The population consisted of AMI-patients and representatives of the general public. **Results:** There was good knowledge about typical AMI-symptoms among the participants. The majority thought an AMI always starts suddenly. Patients did not know more about the time-dependency of treatment outcome than the general public. A greater proportion of the general public would contact an additional person before consulting medical professionals. **Conclusions:** Patients had no better knowledge about AMI than the general public, but would more commonly act appropriately in case of AMI-symptoms.

**Keywords:** Acute Myocardial Infarction; Decision Making; Patient; General Public; Knowledge and Attitudes

## 1. INTRODUCTION

Patients with an acute myocardial infarction (AMI) often delay for hours before consulting medical care [1,2]. Of the total pre-hospital delay time, over half is related to the patient [3,4].

The best effect of reperfusion treatment is when given within two hours [5,6], but to benefit from treatment patients have to seek medical care sooner. Informational interventions aimed at decreasing patient delay time have generally failed to show long-term results [7,8].

People in general often know about chest pain as a symptom of an AMI [9], but commonly fail to recognise other warning signs [9,10]. Knowledge of AMI-symptoms is associated with seeking medical care more promptly [11,12]. Patients usually interpret their symptoms as less serious and not warranting to call for an ambulance [13,14]. Attitudes and opinions of other people also influence the decision time [15-17], as do psychological factors [18,19].

When comparing patients and relatives, no large differences in knowledge of AMI or attitudes toward seeking medical care are apparent [20]. However, studies comparing AMI-patients' and the general public's knowledge of AMI and their intended actions and attitudes in the case of an AMI are generally lacking. Before designing an improved information and education aiming to decrease AMI patients delay time it is important to know how knowledgeable patients and people in general are, and if there are any differences in knowledge between

the groups. Therefore, the purpose of the present study was to investigate if there were any differences in patients' and the general public's knowledge of AMI, their intended action in case of AMI-symptoms, and attitudes toward seeking medical care.

## 2. METHODS

### 2.1. Design

This was a multi-centre study with a descriptive and comparative design.

### 2.2. Population

Patients were recruited from cardiology departments of four Swedish hospitals. Inclusion criteria were:  $\leq 75$  years old, discharged with the diagnosis of AMI within the last year, and living within the hospitals' catchment areas. The population representing the general public had no prior experience of an AMI and was matched with the patients regarding age, gender and catchment area.

### 2.3. Instrument

The questionnaire was developed by the investigators and used in a previous report [20], the formulation of questions and statements was guided by a previous qualitative study [16]. The questionnaire contained 107 questions for the patient group, and 88 for the general public.

Fifteen questions covered background factors such as age, gender, education, and cardiovascular risk factors. Fourteen questions explored the patients experienced symptoms, and five questions concerned experiences of the patients' medical care seeking process (excluded in the general public's questionnaire): These questions used force-choice response alternatives. Knowledge questions encompassed risk factors for having an AMI (four questions, data not shown), possible symptoms (nine questions), ambulance equipment (five questions, data not shown), and four statements regarding AMI. The attitude questions contained statements about intended action in case of a suspected AMI, attitudes toward seeking medical care in case of own AMI-symptoms or if someone else experienced symptoms (34 items). Knowledge and attitude questions used a visual analogue scale (VAS) with the end-points (1) "Do not agree at all" to (5) "Agree". When processing the results the scale was divided into 9 steps (1, 1.5, 2, ..., 4.5, 5).

The questionnaire also contained 16 statements of the participants intended action in the case of experiencing an arm fracture: These questions were developed as a validity test of the questionnaire, as answers were expected to differ from answers related to a suspected AMI.

The final question examined the satisfaction of given information at hospital (only for the patient group).

### 2.4. Procedure

The study used a subset of a population from a previous investigation [20] in six Swedish hospitals: Patients from two of these hospitals were excluded. The sample size from the remaining four hospitals and their catchment areas was estimated as sufficient. This was based on the statistical calculation that in an incidence of 50% of a specific variable, the "true" frequency of this variable in the population will be in the interval between 42% - 58% with a 95% probability, and at an incidence of 10%, a similar 95% confidence interval will be 6.3% - 13.7%.

A nurse from each of two university and two provincial hospitals used the "Register of Information and Knowledge about Swedish Heart Intensive Care Admissions" (RIKS-HIA) to identify eligible patients according to the inclusion criteria and thereafter a list of patients were sent to the first author.

To identify a representative group of the general public the National Population Registry was used. Three individuals were matched to every patient with respect to age, gender and catchment areas. Thus, at least 75 letters per hospital were distributed in the patient group, including invitation letters, study information and questionnaires: 700 questionnaires were sent to members of the general public. The patients received the questionnaires in August 2006-January 2007, and representatives of the general public received them in April-May 2007. Consent to participation was through returning the completed questionnaire. One reminder was sent after 2 - 4 weeks to non-responders. When the answers were received, all personal identification details were destroyed.

In the patient group, the response rate was 78% (range 73% - 82%), and in the general public group the response rate was 59% (range 55% - 63%).

### 2.5. Statistics

The Statistical Package for Social Sciences version 14.0 (SPSS) was used for all statistical analysis. The Chi Square test was used to examine differences between the groups on nominal variables such as background factors. For all ordinal scale variables (knowledge and attitudes), the Mann-Whitney U-test was used. Answers  $\geq 3.5$  (range 1 - 5) on the VAS-scale were considered as agreement. For paired comparisons, the Wilcoxon's test was used. In some results, the population was divided into two age groups:  $\leq 65$  years and  $> 65$  years. Due to the multiple comparisons, a p-value of  $\leq 0.01$  was chosen as the level of significance.

### 2.6. Ethics

The study was approved by the Regional Medical Ethical Committee in Uppsala. The investigation conformed to the principles outlined in the Declaration of Helsinki.

### 3. RESULTS

#### 3.1. Background Characteristics

The study population consisted of 246 patients and 418 individuals from the general public. The median age and gender distribution was similar in both groups. The general public had more years of education than the patients ( $p = 0.006$ ) and more often lived together with someone ( $p < 0.001$ ). The general public had fewer risk factors for coronary heart disease (**Table 1**).

#### 3.2. Knowledge of AMI

There were few differences between patients and the general public regarding knowledge of AMI-symptoms. However, patients had better knowledge of symptoms such as abdominal pain and radiating pain in the right arm (**Table 2**). More than half of all participants believed an AMI always start suddenly; however, the general public more often knew that time is an important factor for treatment outcome in AMI (**Table 3**).

#### 3.3. Intended Actions and Attitudes

The intention to call the alarm number in the case of one's own chest pain was high, but was higher when another person suffered from chest pain. The majority of participants agreed ambulance was the preferable transportation mode when going to hospital because of chest pain. However, the general public to a greater extent than patients preferred to call a taxi. They were also more likely to call the Medical Care Information Service in the case of self-experienced chest pain, and would more commonly contact an additional person before medical professionals. The majority of participants would seek medical care urgently, even for intermittent chest pain. Neither patients nor the general public considered it embarrassing to seek medical care, even if they did not "know" the cause of symptoms (**Table 3**).

**Table 1.** Participants background characteristics.

Characteristics	Patients N = 246 n (%)	General public N = 418 n (%)
Age, median (min-max) years	65 (31 - 75)	65 (31 - 76)
Women	59 (24)	111 (27)
Education > 9 years	124 (51)	229 (61)
Married/Living together	152 (63)	321 (78)
Smoker/Ex-smoker	134 (54)	161 (35)
Angina pectoris	79 (32)	17 (4)
Treated hypertension	152 (63)	129 (31)
Known diabetes mellitus	51 (21)	28 (7)
Treated hyperlipidemia	188 (78)	63 (15)
Prior PCI/CABG*	246 (95)	14 (4)

\* (Percutaneous Coronary Intervention) and CABG (Coronary Artery Bypass Grafting) including procedure at present medical care event for the patients.

**Table 2.** Participants' knowledge of possible AMI-symptoms.

Symptoms	Patients N = 246 n (%)	General public N = 418 n (%)	p-value*
Chest pain/Discomfort	235 (97)	356 (98)	0.230
Pain/Discomfort in left arm	200 (84)	307 (85)	0.090
Pain/Discomfort in right arm	113 (48)	113 (31)	<0.001
Back pain	112 (48)	145 (41)	0.114
Abdominal pain	106 (45)	112 (31)	0.004
Nausea	163 (69)	233 (65)	0.888

\*The Mann Whitney-U test. p-value  $\leq 0.01$  for statistical significance.

#### 3.4. General Public, Gender and Age

Generally, there were few gender differences, although, women had better knowledge of the symptoms of back pain ( $p < 0.001$ ), nausea ( $p < 0.001$ ) and abdominal pain ( $p < 0.001$ ) than men. Neither men nor women considered waiting for symptoms to disappear before seeking medical care (**Table 4**).

Age did not affect the frequency of calling the alarm number if experiencing chest pain. More people in the younger age-group ( $\leq 65$  years) would wait before seeking medical care than older individuals (66 - 75 years), and more commonly thought people must be very ill before being taken care of at the Emergency Department (**Table 4**). Older participants more often believed they would seek medical care urgently in case of own chest pain, even if they did not "know" that the heart caused the symptoms (**Table 4**).

#### 3.5. Comparison between Chest Pain and an Arm Fracture

Participants were asked similar questions regarding chest pain and arm fracture. The answers differed between chest pain and arm fracture ( $p < 0.001$ ) for all statements except two: contacting an additional person in case of own symptoms ( $p = 0.648$ ), and being present when someone else suffered from symptoms ( $p = 0.957$ ).

### 4. DISCUSSION

This study was one of the first to compare AMI-patients and general publics' knowledge of AMI, their intended actions, and attitudes in the medical care seeking process. Some studies have investigated general publics' knowledge about AMI [10,21,22], and one study [23] compares chest pain-patients with community members, but only regarding the intention of calling the alarm number in case of cardiac event.

There were few differences in knowledge between the general public and AMI-patients: The patients were expected to be more knowledgeable, as they had received

**Table 3.** Knowledge of AMI, intended actions and attitudes toward seeking medical care in case of an AMI. Proportion of participants' agreement\*\* to the statements.

Variable	Patients N = 246 n (%)	General public N = 418 n (%)	p-value*
An AMI always starts suddenly.	143 (59)	195 (52)	0.337
Time is of no importance when it comes it comes to treatment results for AMI.	23 (10)	17 (5)	<b>0.003</b>
I would call the alarm number if experiencing own chest pain.	208 (86)	280 (75)	0.012
I would call the alarm number if I meet someone experiencing chest pain.	223 (93)	322 (85)	0.157
Ambulance transportation to hospital is the best choice in case of chest pain.	217 (91)	330 (88)	0.651
I would call a taxi for transportation to the Emergency Department if experiencing own chest pain.	71 (31)	170 (46)	<b>0.001</b>
I would call a taxi for transportation to the Emergency Department if I meet someone experiencing chest pain.	85 (37)	191 (51)	<b>&lt;0.001</b>
I would ask for lift to the Emergency Department if experiencing own chest pain.	83 (36)	156 (42)	0.015
If I experience chest pain, I prefer to wait and see if symptoms disappear before going to hospital.	38 (16)	79 (22)	0.040
I would contact a further person before medical staff, if I suffered from own chest pain.	49 (21)	144 (39)	<b>&lt;0.001</b>
I would seek medical care urgently, even if chest pain was of intermittent character.	197 (84)	296 (80)	0.321
You always have to wait at the Emergency Department, regardless of why you are seeking care.	34 (15)	115 (31)	<b>&lt;0.001</b>
You have to be very ill in order to be taken care of at the Emergency Department when a suspected AMI occurs.	34 (14)	63 (17)	0.087
I would not seek urgent care if I didn't "know" that it was the heart causing the symptoms. It would be embarrassing if the symptoms didn't involve any dangerous complaint.	35 (15)	46 (12)	0.357
It is important to be clean and tidy when going to the Emergency Department.	50 (21)	80 (21)	0.379

\*Mann-Whitney U-test. p-value  $\leq 0.01$  for statistical significance. \*\* Answers  $\geq 3.5$  on the VAS-scale were considered as agreement. PCI: Percutaneous Coronary Intervention.

**Table 4.** Knowledge of AMI, intended actions and attitudes toward seeking medical care in case of an AMI. Proportion of the general publics' agreement\*\* to the statements by gender and age.

Variable	Men N = 307 n (%)	Women N = 111 n (%)	p-value*	$\leq 65$ years N = 236 n (%)	$>65$ years N = 178 n (%)	p-value*
I would call the alarm number if experiencing own chest pain.	203 (75)	77 (74)	0.434	150 (69)	130 (81)	0.024
I would call the alarm number if I meet someone experiencing chest pain.	232 (84)	90 (86)	0.059	178 (82)	144 (88)	0.171
I think people often use ambulance for insignificant things.	46 (17)	9 (9)	<b>0.001</b>	35 (16)	20 (13)	0.012
If I experience chest pain, I prefer to wait and see if symptoms disappear before going to hospital	53 (20)	26 (26)	0.162	55 (26)	24 (16)	<b>0.001</b>
If I meet someone suffered from chest pain, I prefer to wait and see if symptoms disappear before going to hospital.	53 (20)	26 (26)	0.124	55 (26)	24 (16)	0.094
I would not call for an ambulance because all the attention would be embarrassing.	34 (13)	6 (6)	0.056	24 (11)	16 (10)	0.057
You have to be very ill in order to be taken care of at the Emergency Department when a suspected AMI occurs.	45 (17)	18 (18)	0.841	44 (21)	19 (12)	<b>&lt;0.001</b>
I would not seek urgent care if I didn't "know" that it was the heart causing the symptoms. It would be embarrassing if the symptoms didn't involve any dangerous complaint.	32 (12)	14 (14)	0.704	28 (13)	18 (11)	<b>&lt;0.001</b>
It is important to be clean and tidy before going to the Emergency Department.	63 (23)	17 (16)	0.494	34 (16)	46 (29)	0.193

\*Mann-Whitney U-test. p-value  $\leq 0.01$  for statistical significance; \*\* Answers  $\geq 3.5$  on the VAS-scale were considered as agreement.

information from the hospital.

Less than half of all cases of AMI experience chest pain with sudden onset [24], but in the present study more than half of the study population thought an AMI always starts suddenly: This false notion may increase patients' decision time before seeking medical care. Knowledge of AMI-symptoms such as chest pain and radiating pain in the left arm was widespread among the participants, and this result was in accordance with other studies [10,25]. However, the participants in the present study were less likely to indicate pain in the right arm, back- and abdominal pain as AMI-symptoms. The traditional symptoms of an AMI are chest pain and radiating pain in the left arm and those symptoms are often mentioned and well-known by the public. The patients' higher awareness of pain in the right arm as an AMI symptom is probably due to their own experience.

People with limited knowledge of AMI-symptoms [11] or unaware of the importance of prompt treatment [26] are more likely to delay seeking medical care. However, the majority of both patients and the general public in this study knew about time-dependency in treatment outcome. Therefore, only lack of knowledge appeared less important in explaining long patient delay-time.

Patients were more likely to act appropriately in seeking medical care than the general public, which could be explained by having received the recommendations during their previous hospital stay.

The majority of participants reported they would call for an ambulance in case of chest pain, but previous investigations indicate that less than half of all AMI-patients arrive at hospital by ambulance [4,20]. In agreement with another study [23], few participants considered to drive someone suffering from AMI-symptoms to hospital, but in reality up to 60% of AMI-patients are driven to hospital by someone instead of using ambulance [23].

Other people often influence patients' decision to seek medical care [3,15,16]. In the present study, more members of the general public compared to the patients reported that they would contact an additional person before consulting medical professionals. If the person who was contacted lacked knowledge about how to act, it might be a barrier to a correct decision [27].

Only about 1/5 of the participants reported they would wait before seeking medical care in case of self-experienced chest pain, however, this contradicts what many people tend to do in reality [28-30]. Some explanations for long decision times are denial and underestimation of the severity of the situation [18,19,31]. In these cases, the general public might be key-people in influencing quicker decisions.

The female representatives of the general public had better knowledge of the symptoms back pain and nausea:

This concurred with previous studies [10,20]. These symptoms are more common in women [24,32], and it is possible women learn more about them than men do.

Elderly representatives of the general public would more often act appropriately in seeking medical care and may have a more realistic view of the situation and understand the increased risk of having a serious condition [33].

#### 4.1. Method Discussion and Limitations

The patient group was limited to AMI-patients entered in the RIKS-HIA register and admitted to a Cardiology Department. Participants were recruited from different geographic areas in Sweden, which increases the possibility of generalising the results. The age limit of 75 years was chosen to decrease the influence of co-morbidities; thus, the results might not be applicable to people >75 years. The age limit might influence the gender distribution as women develop AMI at an older age. The questionnaire was developed in Swedish, which limited participation for people with language barriers. The questionnaire was not tested for reliability, but there were discrepancies between intended actions in case of chest pain compared to an arm fracture, which was interpreted as evidence of good reliability. Many questions were straight-forward and easy to understand and the statements were based on previous qualitative interviews, which strengthened the validity of the instrument.

#### 4.2. Conclusions

There were generally few differences between the general public and the patients, however patients had no better knowledge of AMI than the general public, but would act more appropriately in seeking medical care for suspected AMI.

Few gender differences were observed in the general public group, but elderly representatives were more likely to act appropriately in case of chest pain than younger participants were.

#### 4.3. Practice Implications

Education and information to patients and the general public about appropriate action in case of symptoms suggestive of AMI need to be improved. Individualized information have to be provided, and the rehabilitation programme should include both written and verbal information about typical and atypical symptoms, the advantage of ambulance use, and the importance of receiving prompt treatment. Participants in the rehabilitation programme should discuss common attitudes and actions that delay seeking medical care, and the advantage in cardiac muscle salvage when receiving fast treat-

ment. Information and education programmes are suggested to be scientifically evaluated before implementation in general use.

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