Reasons Prehospital Personnel Do Not Administer Aspirin to All Patients Complaining of Chest Pain

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Abbreviations:
ACS = acute coronary syndrome
AMI = acute myocardial infarction
BLS = basic life support
EMS = emergency medical services
EMT = emergency medical technician

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Abstract

Introduction: Aspirin is administered to patients with acute coronary syndromes (ACSs), but prehospital providers do not administer aspirin to all patients with chest pain that could be secondary to an ACS.

Objective: To identify reasons prehospital providers fail to administer aspirin to all patients complaining of chest pain.

Methods: A convenience sample of prehospital providers was surveyed as they transported patients with a chief complaint of chest pain to the emergency department. The providers were asked if they had given aspirin, nitroglycerin, or oxygen, or if they utilized a monitor. If the medications had not been administered, the paramedic was asked about the reason. The patient's age and previous cardiac history also was recorded.

Results: A total of 52 patients with chest pain who were transported were identified over eight weeks, and all of the providers agreed to participate in the study. Only 13 of the patients (25%) received aspirin. Reasons given for not administering aspirin to the other 39 patients included: (1) chest pain was not felt to be cardiac in 13 patients (33%); (2) 10 patients already had taken aspirin that day (26%); (3) the medical provider was a basic-level emergency medical technician (EMT)-Basic and could not administer aspirin to six patients (15%); (4) pain subsided prior to arrival of emergency medical services (EMS) in these three patients; and (5) other reasons were provided for the remaining seven patients.

Conclusions: The most common reason that paramedics did not administer aspirin was the paramedic's belief that the chest pain was not of a cardiac nature. Another common reason for not giving aspirin was the inability of EMT-Basic providers to administer aspirin.

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Introduction

The importance of aspirin therapy in patients with acute coronary syndromes (ACS) is well established.[1] With rare exceptions, aspirin is administered to any patient with suspected ACS. Experts recommend that prehospital protocols include aspirin as part of their standing orders for patients with chest pain that could be of cardiac origin.[2] Early aspirin administration following the onside of the discomfort has been shown to improve survival.[3] The use of aspirin by paramedics rarely has resulted in adverse events.[4] Despite clear benefits for the use of aspirin, previous studies of aspirin administration by prehospital providers for patients with suspected cardiac chest pain have shown usage rates to vary between 11% and 74%.[4–9]

In England, a national campaign to standardize care for patients with coronary heart disease has resulted in improvement of the administration rates of aspirin from 54.6% in 1996 to 73.7% in 2001.[8] Snider *et al* utilized a protocol change that required paramedics to give aspirin to all patients with suspected cardiac chest pain, including those who had taken aspirin within the previous 24 hours.[5] This protocol change resulted in an increased rate of administration from 15.1% to 26.8%. The addition of an educational program

on the protocol change increased the administration rate to 37%. An internal review of patients with chest pain transported by the Louisville EMS system during May 2003 found that only 102 of 514 (19.8%) of the patients received aspirin. In order to identify reasons for not utilizing aspirin, a survey was administered to prehospital providers in the emergency department immediately following the admission of patients with chest pain to the emergency department.

Methods

Study Design

This survey was administered to prehospital providers immediately after they had transported a patient complaining of chest pain to the hospital. The study was approved by the Human Studies Committee of the University of Louisville.

Study Setting and Population

This emergency medical services (EMS) system consists of two large EMS agencies that service most of a metropolitan area with a population of approximately one million. The combined annual volume for the two services is 90,000 runs per year. At the time of the study, one agency was operated by the city government and the other by the county government. An investigator was placed in the emergency department of an urban, tertiary care teaching hospital during the first two weeks of the study, and then moved to an urban, tertiary-care hospital for the last six weeks of the study.

Study Protocol

The investigator queried all EMS providers presenting with a patient, if the patient had chest pain. If so, the provider was asked to participate in the study. Participants were unaware of the study purpose. If the EMS provider consented to participate, they were asked four questions related to their chest pain protocol. The questions were: (1) "Did you administer oxygen?"; (2) "Did you administer nitroglycerin?"; (3) "Did you administer aspirin?"; and (4) "Did you utilize a monitor?". If the EMS provider indicated that they did not do these items, they were asked their reason for not doing so. The patient's age and previous cardiac history also was recorded.

Data Analysis

Simple descriptive statistics were used (SPSS for Windows, release 11.5.0 [SPSS Inc., Chicago, Illinois])

Results

A total of 52 providers who transported patients complaining of chest pain were approached for the study; all agreed to participate. Aspirin was administered to 13 patients (25%). Nitroglycerin was administered to 24 (52.2%) of the cases, and a monitor was used in 43 (93.5%). Oxygen was administered to all patients.

There were 39 patients who did not receive aspirin. Six patients had been transported in a Basic Life Support (BLS) ambulance. These are staffed with EMT-Basic providers who cannot administer aspirin. Three of these six patients had previous cardiac history and were >70 years of age. In the 33 patients transported by paramedics, the reasons given for not administering aspirin included: (1) chest pain not felt to be cardiac in 13 (39%); (2) 10 already took aspirin that day (30%); (3) the pain subsided prior to EMS arrival in three (9%); (4) experincing congestive heart failure in two (6%); (5) the EMT forgot to administer aspirin to two (6%); (6) one was allergic to aspirin (3%); (7) one had a Do-Not-Resuscitate order (3%); and (8) one had Prinzmetal's angina (3%) (Table 1). Five of the 13 patients for whom the paramedic had felt that the chest pain was not cardiac in nature had previous cardiac histories and were >70 years old.

Discussion

The results of the study indicate that the main reason paramedics do not administer aspirin to some patients is that they do not believe the patient's chest pain is cardiac in nature. At the time of the study, the only protocol in effect that included routine aspirin administration was the protocol for "Ischemic Chest Pain." The protocol required the paramedics to determine if the chest pain was ischemic before administering aspirin. In this study, paramedics followed their protocol and only gave aspirin when they suspected the discomfort was ACS. Since many of the patients who did not receive aspirin were elderly and had cardiac histories, improvements in education should be made to increase the usage of aspirin in the system. Previous research has demonstrated that paramedics can be educated on the indications and contraindications to aspirin administration.[10] Although paramedics may increase their rate of aspirin administration with additional education, they cannot diagnose ischemic chest pain correctly in every case.[11] Atypical chest pain may be common in elderly patients, female patients, African-American patients, and in certain geographic areas.[12,13] The medical director must decide between protocols. Current protocols are restrictive, and require the paramedic to suspect ischemic chest pain prior to utilizing aspirin. A protocol that requires aspirin to be administered to all patients with non-traumatic chest pain would increase the utilization of aspirin and would be easier to remember. A more restrictive protocol is likely to result in some patients with ACS not receiving aspirin, and therefore, not receiving its benefits.[1]

Twelve percent of the patients in this study did not receive aspirin because they were transported by a BLS ambulance. Three of these patients were older (44–50 years of age) and had a cardiac history. Again, this is related to the current regulations in the state that do not allow basic EMTs to administer aspirin. Haynes demonstrated that basic EMTs can be trained to administer aspirin with additional, minimal training.[14]

An internal audit of EMS responses to patients with chest pain found that aspirin was administered to only 19.8%. The current study found that only 25% of the patients experiencing chest pain received aspirin. For some of these elderly patients with cardiac history, ischemic chest pain should have been suspected. Previous studies have shown that even when ischemic chest pain is likely, paramedics frequently do not administer aspirin.[4] No aspect of the history can be used to exclude ACS.[15] As was pointed out by the Institute of Medicine in their report, "*To Err is*

Reason	Number of cases	Percent (%)
Chest pain felt to be non-cardiac	13	(28.3)
Took aspirin today	10	(21.7)
Pain subsided prior to EMS arrival	3	(6.5)
Patient in CHF	2	(4.3)
Paramedic forgot	2	(4.3)
Allergy to Aspirin	1	(2.2)
DNR patient	1	(2.2)
Prinzmetal's angina	1	(2.2)

Table 1—Reasons given by paramedics for not administering aspirin (CHF = congestive heart failure; DNR = Do-Not-Resuscitate; EMS = emergency medical services)

Human: Building a Safer Health System," bad variability must be eliminated.[16] This must be done by assuring systems that aspirin administration has been shown to be effective. Aspirin clearly is effective in improving the outcomes of patients suffering ischemic chest pain, and should be given in every case without clear contraindications.[1]

The timing of aspirin administration is critical. Patients admitted to the hospital with acute myocardial infarction (AMI) have improved survival rates with early aspirin administration.[3] Whether or not administration in the prehospital setting improves survival needs further study.

The administration of nitroglycerin has been shown to have only a minimal effect on the mortality of patients suffering an AMI.[17] Despite this evidence, nitroglycerin is used more commonly than is aspirin. In the internal audit of responses to patients complaining of chest pain, a larger proportion of patients received nitroglycerin than aspirin. While only 19.8% of the 514 patients received aspirin, 262 (51%) of those patients received nitroglycerin.

The major limitation of this study is its small size. A larger study may have identified other reasons why paramedics did not administer aspirin. The final diagnoses of the patients in this study were not determined. There also is a possibility that the EMS providers may have learned of the study during the two month period. This might have improved compliance with the chest pain protocol and overestimation of the actual aspirin usage rates.

Conclusions

Paramedics only administer aspirin to a small percentage of patients experiencing chest pain. A major reason for not administering aspirin was that the paramedic did not believe the chest pain was cardiac in nature. Medical directors may want to revise their current protocols to encourage more widespread administration of aspirin in patients with chest pain. Medical directors of basic life-support services may want to consider expanding the scope of practice of the EMTs.

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