CHARACTERISTICS OF HOSPITAL-CONFIRMED ACUTE MYOCARDIAL INFARCTION CASES CODED AS LOW-ACUITY AT DISPATCH

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BACKGROUND

Cardiovascular disease remains the most common cause of death worldwide, with ischemic heart disease (IHD) causing nearly nine million deaths per year. Coronary heart disease (CHD) is estimated to cause about one-third of all deaths in people over 35 years old, and the incidence of CHD is expected to continue to rise. Acute myocardial infarctions (AMIs)—heart attacks—represent a significant portion of this overall CHD mortality, with approximately 620,000 Americans suffering a first heart attack, and 295,000 suffering a repeat event, each year.

Early recognition of an AMI can increase the patient's likelihood of survival, especially when early recognition leads to early monitoring, treatment, and transport in the prehospital setting. However, identification of AMI can be complicated by the wide variety of symptomologies or presentations. Emergency Medical Dispatchers (EMDs) are often the first point of contact with the medical care system for patients experiencing AMI, and as such, their ability to identify AMI correctly in order to send the most appropriate response is particularly important.

OBJECTIVES

The objectives of this study were to compare hospital-confirmed AMI outcomes with EMD coded low-acuity cases and to identify any common characteristics of the AMIs assigned to those low-acuity codes.

METHODS

Design

The retrospective descriptive study utilized emergency medical dispatch, EMS, and hospital datasets.

Setting

- Salt Lake Valley Emergency Communications Center (VECC) and Salt Lake City Fire Department (SLCFD)
- Data collected from 1 January 2013 to 31 December 2014, using MPDS version 12.2 (©2000-2012 PDC)

Inclusion

- All hospital-confirmed cases, classified using ICD-9-CM
- Corresponding dispatch data coded as ALPHA-level calls, under all the medical Chief Complaint Protocols.

Outcome Measures

- Number of AMIs categorized by patient age and gender and by Chief Complaint Protocol
- Comparison of EMD-described patient problems and EMS findings on scene.

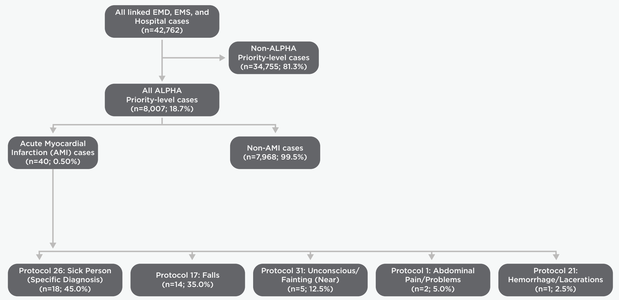

Figure 1: Sampling of ALPHA Priority-level Cases

Hospital discharge destination	All ALPHA cases (n=8,007) n (%)	AMIs (n=40) n (%)
Medical Facility	1,026 (12.8)	17 (42.5)
Home/Self-Care	5,963 (74.5)	11 (27.5)
Home Health Service	409 (5.1)	6 (15.0)
Expired	67 (0.84)	3 (7.5)
Hospice	59 (0.74)	1 (2.5)
Other Health Care Institution	44 (0.55)	1 (2.5)
Other Institution	63 (0.79)	1 (2.5)
Hospital	219 (2.5)	*
Other	157 (2.0)	*

AMI=Acute Myocardial Infarction; *No case

Table 1: Hospital discharge destinations.

Of the total 8,007 ALPHA priority-level cases, 40 (0.5%) were AMIs (Fig. 1). AMIs were distributed across only 5 Chief Complaint Protocols—*Sick Person* was most common (45.0%). A 60.0% majority of the AMIs were of age 75 years and older, and 40.0% were of age 85 years and older (Fig. 2). ALPHA-level AMIs were more prevalent among male patients age 74 years and below, and among female patients age 75 and older.

Of all ALPHA-level cases, approximately 80.0% were discharged to home and 13.0% to a medical facility (Table 1). Of all AMIs, around 43.0% were discharged to a medical facility, 28.0% to home/self-care, and 15.0% to home health service. AMIs were heterogeneously distributed across dispatch determinant codes—most common was the *Sick Person* code for "no priority symptoms," followed by the *Falls* code for injury to a "not dangerous body area" and the *Unconscious/Fainting* determinant code for "fainting episode(s) and alert ≥35 years."

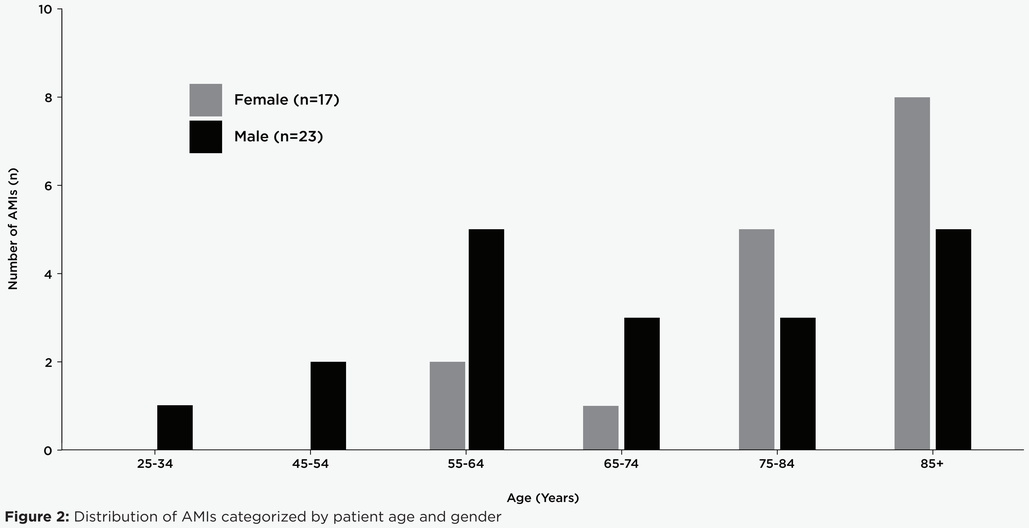

Figure 2: Distribution of AMIs categorized by patient age and gender

DISCUSSION

Overall, very few AMIs are assigned to the low-acuity ALPHA priority level. In general, then, the MPDS is effective in triaging AMIs into the appropriate higher-acuity priority levels.

However, the hospital discharge destinations of the ALPHA assigned AMI cases, few though they are, do indicate that they are of higher acuity than other ALPHA calls and more likely to be true emergencies.

As compared to the overall set of ALPHAs, the ALPHA AMIs were more than three times as likely to be discharged to another medical facility and only one-third as likely to be discharged to home/self-care. Given a larger sample size of ALPHA level calls, patient's age could be a potential differentiator to study.

Chest pain and history of heart problems were very rare in this population—which is an indication that the protocol system is working as designed. When a patient presents with a primary problem of chest pain, the EMD is trained to use the Chest Pain Protocol to rule out symptoms of AMI and other cardiac conditions.

CONCLUSION

Overall, the number of AMI cases assigned to the ALPHA priority level is very low and is confined to very few Chief Complaint Protocols.

No specific sets of characteristics appear to differentiate these calls from other ALPHA-level calls or to identify them as AMIs, with the possible exception of older median age.

Cases assigned to some specific codes, especially the *Sick Person* and *Falls* ALPHA-level codes, may benefit from further study to identify whether additional symptom or demographic information (such as age) could identify AMIs without introducing significant over-triage.

The ALPHA-coded AMIs in this study showed characteristics very consistent with missed or silent AMIs described in other healthcare settings.

ACKNOWLEDGMENTS

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