Patients who have symptoms suspicious for an acute coronary syndrome (ACS) should be evaluated as soon as possible after symptom onset if for no other reason than to identify those with ST elevation myocardial infarction (STEMI) who can benefit from timely reperfusion therapy. In our society, we expect that all patients, regardless of individual characteristics (eg, age, gender, race, socioeconomic status, and neighborhood location), should be treated equally. Therefore, when an analysis of emergency medical services (EMS) run sheets in a large urban setting, such as Dallas County, Tex, leads to the conclusion that women have 50% greater odds of being delayed in the EMS setting compared with men, significant attention should focus on the validity of the results and their public health/societal implications.

In this issue, Concannon et al conducted a retrospective cohort study of 5887 patients with suspected cardiac-related symptoms evaluated by EMS providers from 10 municipalities in Dallas County, Tex, during 2004. They examined associations between a variety of patient/EMS run characteristics and the elapsed EMS time from patient call to hospital arrival divided into 3 intervals (response time, on-scene time, and transport time). Median elapsed time in EMS for all patients as a group was 34 minutes. The authors used a variety of multiple logistic regression models to identify predictors of average elapsed time in EMS, adjusting for distance traveled, onset time, patient vital signs, age, race, and neighborhood socio-economic composition. Although women were delivered to the hospital an average 2.3 minutes slower than men (which the authors acknowledge is not a large enough difference to be of any biological significance), they determined that women were approximately 50% more likely than men to be in the 11% of calls in which the time spent in EMS was >15 minutes beyond the median 34 minute elapsed time of the group as a whole. Furthermore, all of the additional time delays emanated from the on-scene and transport time intervals rather than the initial EMS response time from 911 call receipt to unit arrival on scene.

The authors point out that the run sheet data used in the study is inadequate to determine why women were more likely to be delayed, but suggest that these findings might be yet another example of gender disparity in cardiovascular care driven by differences in ACS symptom presentation between men and women as well as recognition by the patient and EMS personnel. Although these hypotheses are plausible, other explanations should be considered.

Time on scene is not always completely under the control of EMS personnel. In a significant number of calls, particularly those in which someone other than the patient dials 911, the patient may refuse EMS evaluation and transport. EMS crews often spend significant amounts of time trying to persuade reluctant patients to permit an adequate EMS assessment and transport to the hospital. Unless such issues are documented on the EMS run sheet, investigators have no way of knowing whether they occurred on a given call, or whether there were gender differences in the frequency of these challenges.

The authors do not report whether EMS agencies throughout Dallas County were performing prehospital 12-lead ECGs during the study period. EMS agencies in Dallas County were, in fact, equipped with prehospital 12-lead ECG equipment during the study period, and it was routine for their paramedics to perform this procedure on patients with suspected cardiac symptoms. It is not surprising to see a several minute additional on-scene delay in women compared with men because of the extra time required to preserve a woman’s modesty while performing this test. Because the investigators chose to look at an arbitrary 15-minute cutoff delay beyond the median group elapsed time, a slightly longer on-scene time for diagnostic testing would be expected to push more calls involving female patients over the 15-minute cutoff.

How could one explain the longer transport time in women? Many EMS systems allow patients a choice of destination hospital as long as specialized emergency care is not required (common exclusions include transport of patients with major traumatic injuries to trauma centers, acute stroke cases to designated stroke centers, and patients with electrocardiographic confirmation of ST elevation myocardial infarction to interventional facilities). When patients are given the right to choose their destination hospital, they often opt to go to a more distant facility rather than the nearest hospital. It would be helpful to know whether any gender differences in choice of destination hospital could, at least in part, explain the longer transport times in women.

Each year, several hundred public safety (ie, police, fire, EMS) workers lose their lives in the line of duty. It has been estimated that there are approximately 12.7 fatalities per 100 000 EMS workers annually due to ambulance crashes.
Because of this, EMS personnel are trained to refrain from “lights and sirens” transport unless compelling clinical information justifies the risk. Because prehospital 12-lead ECGs were performed routinely in the Dallas County EMS system during the study period, if women had ECG findings indicative of ischemia or infarction significantly less often than men, fewer of the women would have been transported to the hospital using lights and sirens. This would have resulted in a longer transport time interval for women. Thus, it would have been helpful if the authors had access to the hospital records to determine how many patients were ultimately diagnosed with ACS, especially those with ST elevation myocardial infarction. Any future analysis should adjust for differences in ACS prevalence between males and females to see if this eliminates the apparent gender disparity in EMS delay.

The authors should be commended for taking the first serious look at potentially avoidable EMS delays in patients with suspected ACS and for introducing the technique of focusing on cases in which the EMS time intervals are significantly longer than the group median. Their technique was able to identify a potential gender disparity that was all but invisible from simple comparison of the median time intervals between groups.

Future investigations should consider borrowing another technique from EMS: reporting the 90th percentile time interval rather than looking at the median plus some arbitrary number of minutes. EMS systems evaluate and benchmark their ambulance response time intervals by calculating the percentage of calls in which an advanced life support unit arrives on location within 8 minutes 59 seconds or less from the time of 911 call receipt. The current national goal is for high-performance EMS systems to attain this goal on at least 90% of calls. Systems also look at the median response time interval, but the philosophy is that the median response time interval (ie, half the patients wait longer for the ambulance to arrive) is less important than a measure tracking the service that can be delivered most of the time in the eyes of the public.

Does gender bias really exist in delivering timely service to patients with suspected ACS? Perhaps, but it is not clear that this vanguard study provides a definitive answer. Nonetheless, it is a critical issue and deserves follow-up study.

Disclosures
Dr Ornato is the Chairman of Data Safety Monitor Board, NIH-sponsored IMMEDIATE trial; Cardiac Co-Chairman of NIH-sponsored Resuscitation Outcomes Consortium; Science Advisory Board member of National Registry of Myocardial Infarction (sponsored by Genentech); and STRIVE lecture series speaker (sponsored by Bristol Myers Squibb Sanofi).

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