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Selected Topics: Prehospital Care

EFFECT OF GENDER ON PREHOSPITAL REFUSAL OF MEDICAL AID

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☐ **Abstract—Background:** "Refusal of medical aid" (RMA) is the term commonly used by emergency medical technicians (EMTs) when someone calls 911 for care (usually the patient or a family member) but, after the initial encounter with the EMTs, the patient refuses emergency medical services transport to the hospital. Some intervention may have been performed, such as taking vital signs or an electrocardiogram, before the RMA. Although there have been multiple studies of the characteristics and outcomes of patients who RMA, little analysis has been done of the role of EMTs in these cases. **Objective:** To analyze the association between EMT gender and the patient's decision to refuse medical aid in the prehospital setting. **Methods:** The study was performed using data from one hospital-based ambulance service in an urban setting that participates in the 911 system. This was a case control study that examined the data from consecutive patients who refused medical aid for a 1-year period compared to a control group of non-RMA patients. **Results:** There was a significantly higher representation of all-male EMT teams in the RMA group ($p < 0.0001$). Using propensity score-matching methodology to control for other factors, all-male EMT teams were 4.75 times more likely to generate an RMA as compared to all-female and mixed-gender EMT teams (95% confidence interval 1.63–13.96, $p = 0.0046$). **Conclusion:** We found that the gender of the EMTs was one of the most important factors associated with RMA, with a much higher frequency of RMAs occurring when both members of the team were male. © 2012 Elsevier Inc.

INTRODUCTION

Due to the potential for an adverse outcome, especially in older patients, refusal of medical aid (RMA) for emergency medical services (EMS) transport to a hospital is problematic and should be discouraged as much as possible. In one study, 2% of RMA patients (10 of 431) were subsequently hospitalized; 70% of these patients were over the age of 65 years (1). In another study specifically looking at RMA patients aged 65 years and older, 70% of patients sought follow-up medical care (70 of 100) and there was a 32% hospital admission rate. Thirty-nine percent of these admitted patients ended up in an intensive care unit (2). If we can identify factors influencing RMAs, we can better suggest interventions that may decrease them in the long term.

We sought to better understand the factors associated with a patient's decision to RMA in the prehospital setting, particularly focusing on emergency medical technician (EMT) gender. The association between EMT gender and the patient's decision to RMA has not, to our knowledge, been previously studied. However, there have been several studies suggesting that health care providers in other settings are perceived differently by patients based on their gender. Both male and female patients prefer female health care providers regardless of the provider's

bedside manner in studies involving obstetricians, therapists, dentists, and nurses (3–6). It is possible that in the prehospital setting, patients might also prefer being treated by a female EMT, and for this reason be less likely to RMA. Our study sought to determine if there was an association between EMT gender and calls resulting in an RMA rather than a transport.

MATERIALS AND METHODS

Study Design

This was a case control study. Cases were defined as all patients who refused medical aid within a 1-year period, August 1, 2005 through July 31, 2006. These cases were identified by doing a search of the HealthEMS database for every chart with the disposition code RMA for the given time period. The cases were then compared to a control set of all non-RMA patients evaluated by our EMS Department in a 24-h period for 10 randomly selected days within the same 1-year period. Using SAS 9.1 for Windows (SAS Institute Inc., Cary, NC), the control group was created by randomly selecting 10 days from the study year and including all patients who did not RMA. These 10 randomly selected days included 6 weekdays and 4 weekend days, and representations from 8 of the 12 months of the year. No holidays were in this group. All data were collected via retrospective chart review. One emergency medicine resident collected the data for the RMA set, and a second resident collected the data for the control set; both were trained by the primary author (R.W.), and their work was reviewed by checking random charts.

Setting

The study was performed using data from one hospital-based ambulance service in an urban setting with two Basic Life Support (BLS) units and three Advanced Life Support (ALS) units. In the New York City EMS system, hospital-owned, municipal, and volunteer ambulances all participate in the 911 dispatch system, and all operate under the same protocols. Staffing and supplies are provided by the hospital for our ambulances. Patients are generally brought to the closest hospital from the call, and the ambulances in this study transport to about 10 different 911 receiving hospitals. Patient calls involving both BLS (two EMT-Bs) and ALS (two EMT-Ps) units were included. The 911 dispatcher decides which type of ambulance to send based on the call type (e.g., chest pain generates an ALS ambulance). For the purposes of this article, both EMT-Bs and EMT-Ps (paramedics) will be referred to as "EMTs."

EMTs are authorized to operate independently in RMA situations, and are required to contact an on-line medical control physician only if the patient is younger than 5 or older than 65 years. If the EMTs feel that transport is medically necessary, in a case such as severe chest pain in an older person, they will contact medical control to have a physician speak to the patient. RMAs are initiated by the patient; the EMTs are not allowed to refuse to transport patients who they believe do not need an ambulance. For transported patients, one EMT drives the ambulance so has less patient contact than the other. However, for RMA situations, both EMTs are present and involved in the entire patient encounter because it does not result in transport.

A chart is generated for all RMAs, with whatever information the EMT is able to obtain. RMAs were included in our study whether or not the EMT contacted a physician and whether or not the EMT felt transport was medically necessary. We did not include any cases in which no patient was found, because this type of encounter is coded differently in our computer system.

During the study period, there were a total of 19,455 patient encounters, of which 238 resulted in an RMA (1.2%). At the time of the study, there were a total of 82 EMS employees, including 67 men (82%) and 15 women (18%). All patients and all EMS employees working within the time frame were included, with no restrictions. The same physician (R.W.) classified the chief complaints into the following categories: none, social, pulmonary, cardiac, gastrointestinal, neurologic, infection, dizziness/syncope, trauma, psychiatric, and other. The day tour was defined as 7:00 a.m. to 3:00 p.m., evening as 3:00 p.m. to 11:00 p.m., and night as 11:00 p.m. to 7:00 a.m.; there was some variation in the start and end times of these shifts, but by no more than 1 hour. The calls were also stratified by time within shift, based on whether the dispatch time was in the first 2 h of the shift, the middle 4 h, or the last 2 h.

Primary Data Analysis

Data analysis was performed using SAS 9.2 for Windows. To test for differences between normally distributed continuous variables, the Student's t test was used. For non-normally distributed continuous variables, the Wilcoxon rank-sum test was used. For categorical variables, the chi-squared test or the Fisher's exact test was used where appropriate. Due to the problem of multiple comparisons, a Bonferroni-like adjustment was used in determining the level of significance. With this adjustment, a p value < 0.01 was considered significant.

The propensity score-matching methodology was used to minimize selection bias and to accurately address the effect of paramedic team gender on RMAs (7). Using the 8 to 1 digit match "greedy algorithm" from Parsons, a 1:1 case-control match on propensity score was done