



Gender Differences in Transportation to Trauma Center amongst Older Adults with Head Injuries



Anto-Ocrah M, MPH, MT(ASCP); Jones CMC, MPH, PhD; Bazarian J, MD, MPH; Cushman JT, MD, MS; Dozier A, BSN, MS, PhD; Gillespie S MD; Caterino J, MD, MPH; Cheng J, MD, MPH; Shah MN, MD, MPH

Objective

To determine whether gender differences exist in the transportation of head injured older adults by emergency medical services (EMS) providers to a trauma center.

Background

Trauma center care reduces the risk of mortality for severely injured patients by 25%.

Treatment at a trauma center is predicated upon accurate EMS field triage decisions.

Decision tools are designed to guide EMS provider selection of a destination hospital.

However, little is known about the gender differences in field triage.

Methods

We conducted a **prospective multi-center study** of injured EMS transported patients with the following inclusion criteria:

- Age 55 or older
- Transported by EMS to one of four hospitals in a community, one of which is a designated trauma center
- Any injury severity

Interviews were conducted with each patient's EMS provider using a standardized survey to assess:

- Clinical presentation
- Mechanism of injury
- Evidence of head injury

Statistical Analysis

All analyses were limited to subjects with EMS provider suspicion of head injury.

Descriptive statistics were used to characterize the study sample.

Chi Square test was used to assess unadjusted gender differences according to destination hospital type (trauma center (TC) vs. non-trauma center community hospital (NTC)).

A multivariable logistic regression model was developed to assess gender differences while adjusting for relevant covariates:

- Patient age (≤ 75 vs > 75)
- Injury mechanism (Fall, MVC, Other)
- GCS (≤ 13 vs > 13)

Results

889 subjects were included in the analysis

- Median age was 79 (range 55-102)
- 504 (57%) were female

Transport to a trauma center versus non-trauma center **differed significantly by gender** ($p < 0.001$).

Males:

- 173 (51.3%) transported to TC
- **214 (38.8%) transported to NTC**

Females:

- 164 (48.7%) transported to TC
- **338 (61.2%) transported to NTC**

Results

Table 1: Demographics and characteristics of Study Participants (n=889)

	TC (n=337) n (%)	NTC (n=552) n (%)
Gender (p=0.0002)		
Female	164 (48.7)	338 (61.2)
Male	173 (51.3)	214 (38.8)
Age (years) (p<0.0001)		
55-65	107 (31.8)	86 (15.6)
66-75	77 (22.9)	94 (17)
>75	153 (45.4)	372 (67.4)
Ethnicity (p=0.068)		
Hispanic	6 (1.8)	22 (4.0)
Not Hisp/Unknown	331 (98.2)	530 (96)
Race (p<0.0001)		
Black/AA	35 (10.4)	24 (4.4)
White	298 (88.4)	502 (90.9)
Other	4 (1.2)	26 (4.7)
GCS (p=0.0011)		
≤ 9	15 (4.5)	8 (1.45)
10-13	37 (11)	36 (6.5)
>13	285 (84.6)	508 (92.0)
Injury Mechanism (p<0.0001)		
Fall from Standing	194 (57.6)	420 (76.1)
Fall from Height	57 (16.9)	91 (16.5)
MVC	41 (12.2)	18 (3.3)
Other	45 (13.4)	23 (4.2)

In unadjusted analyses, **females had a 40% decreased odds of transportation to a trauma center compared to males**. In multivariable analysis the effect was attenuated but remained statistically significant (OR=0.74, 95%CI:0.55-0.99)

Results, continued

Crude and Adjusted Odds of Transportation to Trauma Center by EMS		
	OR	95% CI
Unadjusted/Crude Analyses		
Female (vs Male)	0.60	0.46-0.79
Adjusted Analyses		
Female (vs Male)	0.74	0.55-0.99
Age ≤ 75 (vs > 75)	1.98	1.47-2.67
Injury Mechanism		
MVC (vs Fall)	3.81	2.12-6.86
Other (vs Fall)	2.99	1.73-5.19
GCS ≤ 13 (vs > 13)	2.17	1.39-3.40

Conclusions

In our sample, **older female patients with head injuries were less frequently transported to a trauma center compared to males**, even when adjusting for other clinical factors.

Although the reasons for the observed differences are not known, possible explanations include:

- Perceived difference in injury severity
- Perceived benefit of trauma center care
- Subconscious gender bias

Future studies should further explore reasons for field triage decisions, including the effect of gender.