Site variation in EMS Treatment, Transport and Survival in relation to Restoration of Spontaneous Circulation (ROSC) for Adult Out-of-Hospital Cardiac Arrest: The Resuscitation Outcomes Consortium (ROC) Epistry

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Site Variation in EMS Treatment and Transport for Adult Out-of-Hospital Cardiac Arrest: The Resuscitation Outcomes Consortium Epistry

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Background

• Reported OHCA survival is variable

• Other contributors to variability?
Objectives

• Explore and describe site-level variation in proportion of OHCA who are:
  – treated by EMS
  – transported to emergency departments
  – transported with and without ROSC in the field
Methods

• Epistry Data
  – Prospective population based cohort study with uniform Utstein-style data definitions from all ROC sites in North America.

• Population: 14,604 patients
  – >20 years of age
  – Non-traumatic out-of-hospital cardiac arrest
  – 1 year: 12/1/05 to 11/30/06
  – 8 ROC sites with complete data
Methods

• **Definitions:**
  – OHCA: Out of Hospital Cardiac Arrest
  – Treated: Received CPR by EMS or any defibrillation
  – Survived: Discharged alive from hospital

• **Limitations:**
  – ROSC measured at single point in time
  – Final vital status does not consider neurologic outcome
• Adjusted and unadjusted tests of heterogeneity across the sites

• Covariates adjusted for:
  – Patient Characteristics: sex, age
  – Scene Characteristics: public location, ALS care
  – Cardiac Arrest Characteristics: initial cardiac arrest rhythm, EMS witnessed, bystander witnessed and bystander CPR
Adult OHCA
N=14,604

Resuscitation Attempted
n=8,505 (58%)

No Resuscitation Attempted
n=6099 (42%)

Transported
n=4,936 (58% of treated)

Survived to Discharge
n=664 (13% of transported)
Treatment and Transport: Site Variation

- Treated by EMS (38-68%, p<0.0001)
- Transported from the scene (48-89% of treated, p<0.0001)
Transport and ROSC: All Sites

Transported N=4,936

Transported After ROSC
n=2015 (41%)

Survived to Discharge
n=548 (27%)

Decision to Transport in the absence of ROSC
n=2921 (59%)

Survived to Discharge
n=116 (4%)
ROSC Prior to Transport and Survival: Site Variation

Transported OHCA Patients
Survived (p<0.0001)
Died (p<0.0001)

Site 1 Site 2 Site 3 Site 7 Site 8 Site 4 Site 6 Site 5
No ROSC Prior to Transport and Survival: Site Variation

- Survived (p<0.0001)
- Died (p<0.0001)

Transported OHCA Patients
Conclusions

• Large inter-site variations in treatment and transport may be one of the causes of variability in reported survival.

• Survival of patients transported prior to or in the absence of ROSC is poor.

• Low percentages of transport prior to ROSC do not appear to adversely affect survival.
Next Steps

- Better understand site variability
  - Protocol review and site survey
  - EMS and hospital factors
  - Community and population factors

- Explore and describe differences between patient groups
  - Treated versus untreated patients
  - Patients transported without versus with ROSC in the field
Thank you for your time.

Questions?