The Impact of Age on Outcomes and Mode of Transport in Trauma

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The Impact of Age on Outcomes and Mode of Transport in Trauma

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Background

- Patient outcomes better with Private Vehicle Transport (PVT) vs Emergency Medical Services (EMS)

- Age impacts trauma outcomes

- Hypothesis:
  - Older patients would be more likely to utilize EMS transportation over PVT
  - Improved outcomes with PVT would be demonstrated across all age groups
Methods

• Academic, Regional, Level 1 Trauma center in Detroit between 2013-2017
  • N=4997

• Retrospective study utilizing data from the following sources:
  • Trauma registry
  • Patient chart reviews

• Inclusion criteria
  • Trauma patients arriving via PVT or EMS with any of the three dispositions
    • Admitted
    • Deceased in ED
    • Transferred out of Hospital
Methods (cont.)

- Exclusion criteria; anyone transferred from outside hospital
- Age classification:
  - Pediatric (age 0-14)
  - Adult (age 15-64)
  - Geriatrics (age 65+)
- Chi square tests for nominal data and independent sample t-tests for continuous data
  - Significance defined as $p < 0.01$
<table>
<thead>
<tr>
<th>Age Classification</th>
<th>PVT</th>
<th>EMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL PATIENTS</td>
<td>35.7</td>
<td>64.3</td>
</tr>
<tr>
<td>GERIATRIC</td>
<td>35.7</td>
<td>64.3</td>
</tr>
<tr>
<td>ADULT</td>
<td>33.9</td>
<td>66.1</td>
</tr>
<tr>
<td>PEDIATRIC</td>
<td>56.9</td>
<td>43.1</td>
</tr>
</tbody>
</table>

Chart 1: Percentage of Patients Using PVT vs. EMS by Age Classification
Chart 2: Average Glasgow Coma Scale Score by Age and Mode of Transport

- **PEDIATRIC**
  - PVT: 14.5
  - EMS: 13.5
  - p value = 0.009

- **ADULT**
  - PVT: 15
  - EMS: 14
  - p value < 0.001

- **GERIATRIC**
  - PVT: 16
  - EMS: 13
  - p value < 0.001

Chart 3: Average Heart Rate by Age and Mode of Transport

- **Adults**
  - PVT: 120
  - EMS: 100
  - p value = 0.206

- **Geriatrics**
  - PVT: 150
  - EMS: 120
  - p value = 0.012

- **Peds**
  - PVT: 140
  - EMS: 110
  - p value < 0.001
Chart 4: Mechanism of Injury By Age In PVT vs. EMS

% PENETRATING (PEDIATRICS)
% BURN (PEDIATRICS)
% BLUNT (PEDIATRICS)

% PENETRATING (GERIATRICS)
% BURN (GERIATRICS)
% BLUNT (GERIATRICS)

% PENETRATING (ADULTS)
% BURN (ADULTS)
% BLUNT (ADULTS)

P value <0.001
P = 0.092
P < 0.001
P = 0.023
P value <0.001
P = 0.764
P < 0.001
P = 0.071
P value <0.001
P < 0.001
P < 0.001
P < 0.001

PVT — EMS
Chart 5: Average Intensive Care Unit (ICU) Stay and Average Length of Stay (LOS) In Days

- LOS (Geriatrics)
- ICU (Geriatrics)
- LOS (ADULTS)
- ICU (ADULTS)

Chart 6: Mortality Within Age Groups Between PVT and EMS

<table>
<thead>
<tr>
<th></th>
<th>Adults</th>
<th>Geri</th>
<th>Peds</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS</td>
<td>23</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>PVT</td>
<td>188</td>
<td>30</td>
<td>5</td>
</tr>
</tbody>
</table>

P < 0.001
P = 0.096
P = 0.125
Conclusions

• Pediatrics had higher PVT use
  • EMS more likely to take patients to children’s trauma center

• Increased age correlates with a greater likelihood of utilizing EMS

• PVT utilization correlates with decreased mortality in adults

• Other outcome measures were improved in patients arriving via PVT (when excluding pediatric sample)