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 $p < 0.01$
Chart 1: Percentage of Patients Using PVT vs. EMS by Age Classification

<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 2: Average Glasgow Coma Scale Score by Age and Mode of Transport

- PEDIATRIC: p value = 0.009
- ADULT: p value < 0.001
- GERIATRIC: p value < 0.001

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

- Adults: p value < 0.001
- Geriatrics: p value = 0.206
- Peds: p value = 0.012
Chart 4: Mechanism of Injury By Age In PVT vs. EMS

- **% PENETRATING (PEDIATRICS)**
  - PVT: 45%
  - EMS: 15%
  - P value <0.001

- **% BURN (PEDIATRICS)**
  - PVT: 30%
  - EMS: 20%
  - P = 0.764

- **% BLUNT (PEDIATRICS)**
  - PVT: 25%
  - EMS: 65%
  - P < 0.001

- **% PENETRATING (GERIATRICS)**
  - PVT: 30%
  - EMS: 10%
  - P < 0.001

- **% BURN (GERIATRICS)**
  - PVT: 40%
  - EMS: 30%
  - P = 0.071

- **% BLUNT (GERIATRICS)**
  - PVT: 30%
  - EMS: 60%
  - P < 0.001

- **% PENETRATING (ADULTS)**
  - PVT: 20%
  - EMS: 10%
  - P < 0.001

- **% BURN (ADULTS)**
  - PVT: 30%
  - EMS: 20%
  - P < 0.001

- **% BLUNT (ADULTS)**
  - PVT: 50%
  - EMS: 30%
  - P < 0.001
Chart 5: Average Intensive Care Unit (ICU) Stay and Average Length of Stay (LOS) In Days

- LOS (Geriatrics)
- ICU (Geriatrics)
- LOS (Adults)
- ICU (Adults)

<table>
<thead>
<tr>
<th></th>
<th>EMS</th>
<th>PVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOS (Geriatrics)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOS (Adults)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICU (Geriatrics)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICU (Adults)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P < 0.001

Chart 6: Mortality Within Age Groups Between PVT and EMS

- Adults: 23
- Geri: 9
- Peds: 2

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