All-Terrain Vehicle (ATV) Related Pediatric Fatalities: Epidemiology and Risk Factors

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Research Objective
Objective: Determine the relative contribution of major risk factors to pediatric ATV-related fatalities

What is an ATV?
All-Terrain Vehicles, also known as ATV's, are four-wheeled motorized vehicles designed for use on off-road terrains. Their high center of gravity and low pressure tires make them particularly prone to rollovers.

Background
According to the U.S. Consumer Product Safety Commission (CPSC) there are over 800 ATV-related deaths and 150,000 emergency department visits each year.

- Since 1985, approximately one-quarter of deaths and one-third of injuries occurred in children under 16 years of age.
- The major risk factors for ATV-related deaths and injuries are operating age-inappropriate vehicles, lack of training, alcohol or drug use, lack of helmets, speed, riding on roads, and carrying passengers on single rider vehicles.

Methods
- Retrospective study using the CPSC ATV fatality database (1985-2008, 10,000 ATV-related deaths).
- Descriptive analysis (Excel)
- Chi-square comparison of proportions (Vassar website for statistics).
- Multivariate logistic regression analysis (Statistical Analysis Software, SAS)

Demographics:

<table>
<thead>
<tr>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youth</td>
</tr>
<tr>
<td>Adult</td>
</tr>
</tbody>
</table>

Results

<table>
<thead>
<tr>
<th>Engine Size</th>
<th>&lt;80 cc</th>
<th>100-350 cc</th>
<th>&gt;350 cc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Factor</td>
<td>Yes</td>
<td>54%</td>
<td>46%</td>
</tr>
</tbody>
</table>

Brain Injuries

| Yes | 37% |
| No  | 63% |

Carrying Passengers

| With | 54% |
| No   | 46% |

Risk Factors:
- Over 90% of fatal crashes involved the wrong-size machine.
- 60% occurred on the road.
- Almost half of all crashes involved passengers.
- 6.7% of fatal pediatric crashes involved alcohol.
- Among pediatric operator crashes with alcohol involved, 95% of the were 16-17 years old.

Conclusions

- The most serious risk factors in decreasing order are: being male, wrong-size machine, riding on the road, and carrying passengers.
- The highest risk youth age range is 12-15 years of age.
- Current ATV’s weigh over 800 lbs and can go over 80 mph.
- Riding on the road is common even though it is against the law in most states.
- There is a very high incidence of fatal brain injury and helmets could reduce fatal brain injuries by half.

Implications

Preventing these injuries is going to take multiple approaches based on the 3 E’s of injury prevention: education, engineering, and enforcement.

- Education: Teaching youth about ATV Safety
- Engineering: Engineering more stable vehicles
- Enforcement: Passing additional ATV laws and enforcing them

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Works Cited