Circumstances surrounding 39 cases of bathtub drownings in the elderly

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Introduction

• Bathing is an essential ADL
  – Most problematic self-care activity when aging (Guay et al., 2014; Naik et al., 2004)
  – Influenced by physical capabilities (↓ with age) (Gill et al., 2007)

• Large % of bath-related drowning victims are aged 55+
  – In Québec (Canada): 49% vs 4% for children < 5 (Tremblay & Turner, 2010)

• Older adults drowning in the bathtub
  – Under-documented + Mostly in Japan (Hayashi et al., 2010; Suzuki et al., 2015)

To shed light on the circumstances of bath-related drownings in the elderly
Methods

• Census of bath-related drownings
  – Coroner’s report 2005-2014 (public data)
  – Province of Quebec (23% of the population of Canada)
  – ICD-10 codes: W65 (Drowning and submersion while in bathtub)
    W66 (Drowning and submersion following fall into bathtub)

• Analysis
  – < 65 years old were excluded
  – Content-analysis
  – Grid with factors previously associated with bathtub drownings
  – 2 independent analysts
Results

Bath-related drownings
(2005-2014; n=92)

- Seniors: 46 (50%)
- Adults: 39 (42%)
- Children: 7 (8%)
- Women: 59%

Note: The graph illustrates the distribution of bath-related drownings by age group and gender over the period from 2005 to 2014.
Probable cause of drowning

- Heart disease: 53%
- Alcohol: 8%
- Fall/fall-other: 24%
- Other: 5%
- Unidentified: 11%
## Circumstances surrounding bath-related drownings

<table>
<thead>
<tr>
<th>Categories</th>
<th>Circumstances</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event-related components</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Who found the victim (n=37)</td>
<td>Family member (including spouse)</td>
<td>43.2</td>
</tr>
<tr>
<td></td>
<td>Residence staff</td>
<td>35.1</td>
</tr>
<tr>
<td>First on the scene (n=31)</td>
<td>911 team</td>
<td>96.8</td>
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<tr>
<td><strong>Medical circumstances</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External exam (n=33)</td>
<td>Absence/no traumatic/anatomical injury marks</td>
<td>54.5</td>
</tr>
<tr>
<td>Autopsy (n=34)</td>
<td>Heart disease</td>
<td>61.8</td>
</tr>
<tr>
<td>Medical background (n=31)</td>
<td>Blood pressure problems</td>
<td>45.2</td>
</tr>
<tr>
<td><strong>Spatiotemporal circumstances</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place of drowning (n=39)</td>
<td>At the victim’s home</td>
<td>97.4</td>
</tr>
<tr>
<td>Living situation (n=37)</td>
<td>Alone</td>
<td>89.2</td>
</tr>
<tr>
<td>Event situation (n=38)</td>
<td>Alone</td>
<td>94.7</td>
</tr>
<tr>
<td>Dwelling type (n=32)</td>
<td>Seniors residence</td>
<td>43.8</td>
</tr>
<tr>
<td></td>
<td>Apartment</td>
<td>40.6</td>
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<tr>
<td><strong>Physical environment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bathtub assistive technology (n=6)</td>
<td>Emergency button/call bell</td>
<td>66.6</td>
</tr>
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<td></td>
<td>Bath seat</td>
<td>16.7</td>
</tr>
<tr>
<td></td>
<td>Both</td>
<td>16.7</td>
</tr>
</tbody>
</table>
Discussion

• Largest proportion of women expected
  – Represent 56% of the population aged 65+ (Ministère de la Famille et des Aînés, 2012)
  – Drowning in their bathtub more often than men (Wu and Cheng, 2015)
  – Bathtubs + spa: only places where more women drowned (Queiroga & Peden, 2013)

• Victims lived alone and were alone
  – Localization of an emergency bell
  – Wearable emergency button or cell phone

Study limitations

• Reporting bias (Yoshioka et al, 1998, Kurosaki et al., 2002 both cited by Lin et al., 2015)
Conclusion

• 39 seniors drowned in their bathtub (Quebec; 10 years)
  – Causes: heart disease > falls or alcohol
  – Few victims with medical background = heart disease
  – Bathing may induce cardiac distress in older population (Yoshioka et al., 2003)

• Could simple home adaptation reduce physical demands?
Methods – sections of the analysis grid

victim’s sociodemographic profile
- age
- sex

event-related components
- probable cause of drowning
- person who found the victim
- first person on the scene

drowning circumstances
- spatiotemporal circumstances (living situation, dwelling type, place, time, day, etc.)
- medical circumstances (external, internal + toxicological analysis)
- physical environment (bath equipment + accessibility)