Dementia and poisoning in older people: a 10 year review of hospitalisation records in NSW

Rebecca Mitchell¹,², Lara Harvey², Henry Brodaty³,⁴, Brian Draper³,⁴, Jacqui Close²,⁵

¹ Australian Institute of Health Innovation, Macquarie University
² Falls and Injury Prevention Group, Neuroscience Research Australia
³ Dementia Collaborative Research Centre – Assessment & Better Care, University of NSW
⁴ Centre for Health Brain Ageing, School of Psychiatry, University of NSW
⁵ Prince of Wales Clinical School, University of NSW
Background

- Older individuals living with dementia increase from 2.8 million in 2012 to 9.4 million by 2050 in Australia (Deloitte Access Economics, 2011)
- Injury a common cause of hospitalisation for people with dementia (AIHW, 2012)
- Poisoning the 3rd most common injury-related hospitalisation for people with dementia
- Two-thirds of 60+ year olds use 4+ medications (Elliot, 2006)
- Difficulty with compliance with prescribed medications
- Confusion with household products
Aim

• To compare the characteristics of poisoning resulting in hospitalisation in older people with and without dementia and their health outcomes in NSW during 2003 to 2012
• To examine the association of poisoning intent and demographic, comorbid and injury event characteristics
Method

- Individuals 50+ years
- Identification of poisoning using principal diagnosis of ICD-10-AM:T36-T60
  - Unintentional (ICD-10-AM: X40-X49); intentional (ICD-10-AM: X60-X69) poisoning
  - n=1,513 undetermined intent (ICD-10-AM: Y10-Y19) not considered
- Identification of dementia using all diagnosis classifications
- Charlson Comorbidity Index (Quan et al 2011)
- 1 year look-back period to 1 Jan 2002
- Identification of mental health diagnoses, depression, delirium, and alcohol abuse and dependence within period of care only
**Method: analysis**

- Descriptive statistics
- 30-day mortality calculated from date of admission
- 28-day hospital readmission from hospital discharge date
- Hospital LOS age-adjusted and included transfers
- Logistic regression examined univariate associations of poisoning intent and demographic, comorbid and injury event characteristics
- Significant univariate predictors in multi-variable logistic regression
- Denominator data for people with dementia only available for 60+ years (Deloitte Access Economics); NSW population (ABS) – age-adjusted
Results: hospitalisations, 2003-2012

• Unintentional poisoning
  • 6,240 people 50+ years hospitalised
  • 581 (9.3%) had dementia identified

  • Hospitalisation rates 60+ years:
    • 31.6 per 100,000 (95%CI: 30.6-32.6) for people without dementia
    • 69.5 per 100,000 (95%CI: 60.4-78.6) for people with dementia

• Intentional poisoning
  • 10,451 people 50+ years hospitalised
  • 314 (3.0%) had dementia identified

  • Hospitalisation rates 60+ years:
    • 32.5 per 100,000 (95%CI: 31.5-33.5) for people without dementia
    • 56.4 per 100,000 (95%CI: 46.7-66.2) for people with dementia
### Results: hospitalisations, 2003-2012

#### UNINTENTIONAL POISONING

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>DEMENTIA (N = 581)</th>
<th>NO DEMENTIA (N = 5,659)</th>
<th>( \chi^2 ) (df)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENDER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>203</td>
<td>2,637</td>
<td>46.6, 28.9 (1)**</td>
</tr>
<tr>
<td>Female</td>
<td>378</td>
<td>3,022</td>
<td>53.4</td>
</tr>
<tr>
<td><strong>AGE GROUP</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-59</td>
<td>15</td>
<td>1,900</td>
<td>33.6, 538.9 (4)**</td>
</tr>
<tr>
<td>60-69</td>
<td>39</td>
<td>1,207</td>
<td>21.3, 54 (1)*</td>
</tr>
<tr>
<td>70-79</td>
<td>169</td>
<td>1,260</td>
<td>22.3</td>
</tr>
<tr>
<td>80-89</td>
<td>302</td>
<td>1,033</td>
<td>18.3</td>
</tr>
<tr>
<td>90+</td>
<td>56</td>
<td>259</td>
<td>4.6</td>
</tr>
<tr>
<td><strong>COMORBIDITIES (EXCLUDING DEMENTIA)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nil</td>
<td>293</td>
<td>3,363</td>
<td>59.4, 17.8 (2)**</td>
</tr>
<tr>
<td>Mild (CCI 1 or 2)</td>
<td>223</td>
<td>1,802</td>
<td>31.8, 111 (1)*</td>
</tr>
<tr>
<td>Severe (CCI ≥3)</td>
<td>65</td>
<td>494</td>
<td>8.7</td>
</tr>
<tr>
<td>Mental health diagnoses(^a) (identified in care episode)</td>
<td>66</td>
<td>939</td>
<td>16.6, 10.7 (1)(^*)</td>
</tr>
<tr>
<td>Depression (identified in care episode)</td>
<td>10</td>
<td>212</td>
<td>3.8, 6.3 (1)(^*)</td>
</tr>
<tr>
<td>Delirium(^b) (identified in care episode)</td>
<td>52</td>
<td>145</td>
<td>2.6, 70.3 (1)(^*)</td>
</tr>
<tr>
<td>Alcohol abuse and dependence (identified in care episode)</td>
<td>40</td>
<td>669</td>
<td>11.8, 12.8 (1)(^*)</td>
</tr>
<tr>
<td><strong>LOCATION OF INCIDENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>308</td>
<td>3,020</td>
<td>53.4, 317 (5)**</td>
</tr>
<tr>
<td>Aged care facilities</td>
<td>122</td>
<td>228</td>
<td>4.0, 21 (1)**</td>
</tr>
<tr>
<td>Health service facilities</td>
<td>79</td>
<td>962</td>
<td>17.0</td>
</tr>
<tr>
<td>Other specified place</td>
<td>&lt;5</td>
<td>245</td>
<td>4.3</td>
</tr>
<tr>
<td>Unspecified place</td>
<td>57</td>
<td>941</td>
<td>16.6</td>
</tr>
<tr>
<td>Not known</td>
<td>13</td>
<td>263</td>
<td>4.7</td>
</tr>
</tbody>
</table>

\(^*p<0.01\), \(^{**}p<0.0001\)
Results: medicinal vs non-medicinal substances

Unintentional poisoning

- No dementia
- Dementia

Intentional poisoning

- No dementia
- Dementia

Percent
Results: unintentional – most common medicinal

- Hormones & synthetic substitutes & antagonists (T38)
- Insulin & oral hypoglycaemic drugs (T38.3)
- Nonopioid analgesics, antipyretics & antirheumatics (T39)
- 4-Aminophenol derivatives (T39.1)
- Narcotics & psychodyseptics (T40)
- Other opioids (T40.2)
- Antiepileptic, sedative-hypnotic & antiparkinsonism (T42)
- Benzodiazepines (T42.4)
- Psychotropic drugs (T43)
- Drugs affecting the autonomic nervous system (T44)
- Primarily systemic & haematological agents (T45)
- Anticoagulants (T45.5)
- Agents primarily affecting the cardiovascular system (T46)
- Diuretics, medicaments & biological substances (T50)
Results: intentional – most common medicinal

Nonopioid analgesics, antipyretics & antirheumatics (T39)
4-Aminophenol derivatives (T39.1)
Narcotics & psychodysleptics (T40)
Other opioids (T40.2)
Antiepileptic, sedative-hypnotic & antiparkinsonism (T42)
Benzodiazepines (T42.4)
Psychotropic drugs (T43)
Other & unspecified antidepressants (T43.2)
Other & unspecified antipsychotics & neuroleptics (T43.5)

Percent

No dementia  Dementia

AUSTRALIAN INSTITUTE OF HEALTH INNOVATION I FACULTY OF MEDICINE AND HEALTH SCIENCES
Results: health outcomes

- **Unintentional poisoning**
  - 30-day mortality:
    - 5.7% for people with dementia
    - 2.1% for people without dementia
  - 28-day readmission:
    - 13.8% for people with dementia
    - 18.8% for people without dementia
  - Mean age-adjusted LOS:
    - 5.1 days for people with dementia
    - 4.2 days for people without dementia

- **Intentional poisoning**
  - 30-day mortality:
    - 1.6% for people with dementia
    - 2.3% for people without dementia
  - 28-day readmission:
    - 21.0% for people with dementia
    - 23.0% for people without dementia
  - Mean age-adjusted LOS:
    - 12.7 days for people with dementia
    - 8.6 days for people without dementia
Results: associations of poisoning intent

- Unintentional poisoning more likely to involve:
  - males than females (OR: 1.21; 95%CI: 1.13-1.28)
  - older age groups than people aged 50-59 years
  - people with dementia (OR: 3.31; 95%CI: 2.88-3.82)
  - people with multiple comorbidities than no comorbidities
  - people residing in aged care facilities than home
    (OR: 5.44; 95%CI: 4.43-6.67)
  - people residing in health service facilities than home
    (OR: 4.56; 95%CI: 4.06-5.13)
Limitations

- Severity of cognitive impairment
- Quantity or number of substances ingested
- Only health conditions relevant to hospital episode reported
- Possible under-enumeration of dementia
- Determination of intent
- Living arrangements e.g. lived alone
- No information on deaths prior to hospitalisation
- Linkage: false positive rate 0.4% and false negative rate 0.5%
Conclusion

- Older individuals with dementia have higher hospitalisation rates for both unintentional and intentional poisoning (population-based study).
- Dementia increases the potential for error and adherence problems.
- Ability to comply with complex drug regimens.
- Home is the most common location; aged care and health facilities.
- Medication storage options, carer involvement; quality use of medication.
- Poisoning is the most common method of self-harm for people with dementia.
- Monitor for mood disturbances, increased aggression, hallucinations, expressions of self-harm.
Acknowledgements

• Research funded by the Dementia Collaborative Research Centre – Assessment and Better Care, UNSW

• Thank the NSW Ministry of Health for access to the APDC, the NSW Registry of Births, Deaths & Marriages for access to mortality data, and the CHeReL for conducting the record linkage