How does Alzheimer’s disease severity impact healthcare resource utilization in Japanese patients

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Overview of the presentation

• Background and aim of the study

• Methodology
  • Data source – Disease Specific Programmes
  • Data collection methodology

• Results
  • Patient demographics
  • Unadjusted comparisons of healthcare resource utilisation (HCRU) by stage of cognitive impairment (CI)
  • Propensity score matched adjustments of HCRU by stage of CI

• Conclusion

• References
**Background and Aim of the study**

**Background**

- In Japan, the number of people with dementia, which stood at about 4.6 million in 2012, is forecast to rise sharply to more than 7 million by 2025.
- Alzheimer's disease (AD) accounts for 50% of dementia cases in Japan.
- About 15% of the people 65 or older in Japan are believed to have dementia to some extent (Japan Times, 2016)

- Milder patients show fewer uses of healthcare resources (Yang et al, 2014)
- As CI progresses and more supervision is required, greater health economic costs are likely to be incurred (Zhu et al, 2006)

**Aim of the study**

- To examine the relationship between disease severity and healthcare resource utilization (HCRU) of AD patients in Japan
A holistic approach taking into account all stakeholders within the patient journey

The leader in best practice for combined studies of this nature

A proven and citable approach

Patients 50 years and older who are currently suffering from CI
Physicians recruited the next 10 consecutively consulting patients suffering from CI

The Adelphi Real World Dementia Specific Programme (DSP) is a cross-sectional survey of consulting Dementia patients

Physicians Sampled
PCPs and Specialists (Neurologists, Geriatricians, Psycho-geriatricians, Psychiatrists, & Neuro-Psychiatrists)

DSP VIII (2013) Fieldwork Timings
Fieldwork took place in Japan.

Data Source
The Adelphi Real World Dementia Specific Programme (DSP) is a cross-sectional survey of consulting Dementia patients

Patient Criteria
Patients 50 years and older who are currently suffering from CI

Patients recruited by physicians
Physicians recruited the next 10 consecutively consulting patients suffering from CI

Physicians completed detailed record forms for consulting patients that met the specified patient criteria - providing a representative ‘point in time’ sample of consulting patients.

The physician provides data on the patient’s demographics, previous treatment history, disease symptoms and severity, patient-management strategies, journey from onset of symptoms to formal diagnosis, reasons for clinical decisions and prescribing patterns.
Patient demographics

Note: Patients reported to be 90+ were assumed to be 90 for the purposes of this analysis.
<table>
<thead>
<tr>
<th>Which category best describes this patient’s stage of CI?</th>
<th>AND</th>
<th>What is the patient’s current diagnosis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCI, amnestic MCI, pre-dementia AD or prodromal AD diagnosis</td>
<td>AD, early onset AD or mixed dementia diagnosis</td>
<td></td>
</tr>
</tbody>
</table>

- **Prodromal (n=112)**: 15%
- **Mild (n=232)**: 32%
- **Moderate (n=293)**: 40%
- **Severe (n=90)**: 12%

**Physician-perceived stage of CI**

- **MCI**
- **Mild**
- **Moderate**
- **Severe**
HCRU by current stage of CI

Consultations

<table>
<thead>
<tr>
<th>Stage</th>
<th>PCP Consultations in Last 12 Months</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prodromal (n=107)</td>
<td>3.2</td>
<td>0.2618</td>
</tr>
<tr>
<td>Mild (n=221)</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>Moderate (n=274)</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>Severe (n=84)</td>
<td>2.9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage</th>
<th>Specialist Consultations in Last 12 Months</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prodromal (n=104)</td>
<td>4.6</td>
<td>0.0009</td>
</tr>
<tr>
<td>Mild (n=216)</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>Moderate (n=265)</td>
<td>7.0</td>
<td></td>
</tr>
<tr>
<td>Severe (n=84)</td>
<td>8.9</td>
<td></td>
</tr>
</tbody>
</table>

Professional Caregiver Hours Required Per Week

<table>
<thead>
<tr>
<th>Stage</th>
<th>Hours Required Per Week</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prodromal (n=109)</td>
<td>3.1</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Mild (n=226)</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>Moderate (n=281)</td>
<td>13.3</td>
<td></td>
</tr>
<tr>
<td>Severe (n=82)</td>
<td>28.3</td>
<td></td>
</tr>
</tbody>
</table>

Note: Kruskal-Wallis tests were performed to assess statistical significance.
<table>
<thead>
<tr>
<th>Stage</th>
<th>Prodromal (n=110)</th>
<th>Mild (n=225)</th>
<th>Moderate (n=290)</th>
<th>Severe (n=89)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently institutionalised</td>
<td>2%</td>
<td>3%</td>
<td>6%</td>
<td>19%</td>
</tr>
<tr>
<td>p &lt; 0.0001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalised in last 12 months</td>
<td>1%</td>
<td>1%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>p = 0.0703</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Chi-squared tests were performed to assess statistical significance.
Propensity score matching (PSM)

- The associations reported above may be influenced by confounding factors
- 1:1 nearest neighbour matching on the propensity score was performed to adjust for confounding factors
  - Mild patients were matched to prodromal patients
  - Pooled mild, moderate and severe patients were matched to prodromal patients
- Confounding factors used to calculate the propensity score included:
  - Demographics (age, sex, body mass index, employment status)
  - Presence of particular cardiovascular comorbidities
  - Number of concomitant medication classes
  - Duration since initial diagnosis (duration of disease)
- Covariate balance was assessed in both models using standardised mean differences (SMDs)
  - Covariates with an absolute SMD <10% can be considered adequately balanced
- Adjusted differences in outcomes between patient groups reported
Consultations by current stage of CI

PSM-adjusted: Prodromal vs Mild

<table>
<thead>
<tr>
<th>Stage</th>
<th>PCP consultations in last 12 months</th>
<th>Specialist consultations in last 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prodromal (n=178)</td>
<td>3.7</td>
<td>4.8</td>
</tr>
<tr>
<td>Mild (n=178)</td>
<td>4.1</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Note: The Abadie-Imbens standard error (AI-SE) and corresponding test statistics and p-value were calculated to assess statistical significance.

PSM-adjusted: Prodromal vs Mild/Moderate/Severe

<table>
<thead>
<tr>
<th>Stage</th>
<th>PCP consultations in last 12 months</th>
<th>Specialist consultations in last 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prodromal (n=447)</td>
<td>3.7</td>
<td>4.2</td>
</tr>
<tr>
<td>Mild/Moderate/Severe (n=447)</td>
<td>4.2</td>
<td>5.3</td>
</tr>
</tbody>
</table>

Note: The Abadie-Imbens standard error (AI-SE) and corresponding test statistics and p-value were calculated to assess statistical significance.
Professional caregiver hours by current stage of CI

**PSM-adjusted: Prodromal vs Mild**

- **Prodromal** (n=178): 2.03 weeks, p = 0.302
- **Mild** (n=178): 4.0 weeks

**PSM-adjusted: Prodromal vs Mild/Moderate/Severe**

- **Prodromal** (n=447): 7.67 weeks, p < 0.001
- **Mild/Moderate/Severe** (n=447): 10.3 weeks

Note: The AI-SE and corresponding test statistics and p-value were calculated to assess statistical significance.
Conclusion

• Increasing levels of cognitive impairment require greater healthcare resources, specifically:
  • Increased number of visits to a specialist
  • Greater required hours of professional caregiving

• Levels of hospitalisations and institutionalisation in Japan also increase with disease severity; however, due to small number of events, statistical significance is often not achieved.

• The difference across severity groups remain even after controlling for patient characteristics.

• The results point to the need for identification and management of patients earlier in the disease if possible, so that the greater impact on disease burden can be minimized.
1) “Japan's dementia time bomb”, Japan Times, April 22, 2016


