Is the degree of cognitive impairment in patients with Alzheimer’s disease related to their capacity to appoint an enduring power of attorney?

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Abstract

Background Clinicians are often asked to retrospectively assess a patient’s capacity to create an Enduring Power of Attorney (EPA). This study will investigate if capacity to create an EPA is significantly related to the degree of cognitive impairment in Alzheimer patients, and whether Mini Mental State Examination score (MMSE) is a good predictor of a patient’s capacity. It also considers if socio-demographic factors are related to a patient’s capacity to create an EPA.

Methods Participants with a DSM-IV diagnosis of Alzheimer’s disease were recruited from the Old Age Psychiatric service at the Queen Elizabeth Psychiatric Hospital, Birmingham, UK. A cognitive assessment of each patient was performed using the MMSE, followed by two independent assessments of their capacity to create an EPA made using a semi-structured interview.

Results There was a significant association between level of cognitive impairment and capacity to create an EPA: \( \chi^2 = 35.15 \) (\( P < 0.0001 \)). MMSE score significantly predicted capacity status (OR = 1.6, 95% CI 0.863–0.979). Optimal sensitivity (86.6%, CI 67.4–95.5%) and specificity (82.2% CI 67.4–91.5%) were obtained using a cutoff MMSE score of 18. Positive predictive value (PPV): 75.8% (95% CI 57–88%), negative predictive value (PNV): 90.2% (CI 76–97%). No socio-demographic factors were significantly associated with capacity to create an EPA.

Conclusions The MMSE could be used as a screening tool to help inform a clinical capacity assessment in patients with Alzheimer’s disease. It is important that patients always undergo individual clinical assessments where possible, but in situations where direct assessment is not possible MMSE score could be used to aid retrospective assessments of capacity to create an EPA.

Keywords: capacity, enduring power of attorney, dementia, Alzheimer’s disease, cognitive impairment, mini-mental state examination (MMSE)

Introduction

The assessment of mental capacity is a contentious issue, and is set to become more important as the proportion of cognitively impaired people in the society rises. In the UK, the number of cases of dementia is projected to rise to around 870,000 by 2010, and to over 1.8 million by 2050 [1]. A common dilemma for patients in the early stages of cognitive decline is whether to create an enduring power of attorney (EPA), in order to give another person the authority to act on the patient’s behalf in relation to their property and financial affairs.

Patients suffering from dementia can be particularly vulnerable to financial exploitation, so it is important that clinicians can accurately assess their capacity to make decisions.

There is no legal requirement for an individual to have their capacity professionally assessed prior to the creation of
an EPA, but where there is any doubt expert medical opinion
should always be sought before signing. Capacity is defined
as the ability to both understand and retain the necessary
information long enough to reach a decision. Whilst there
are currently no validated instruments designed to measure a
person’s capacity to create an EPA, in the test cases Re K, Re
F [1988] the judge set out four pieces of information that any
person creating an EPA must understand (see Appendix 1,
available online). Clinicians can often be called upon to
make a retrospective assessment of a patient’s capacity at
the time of signing the EPA, if subsequent legal disputes
occur. In such cases, clinicians would have to assess the
patient using their medical records and their Mini-Mental
State Examination (MMSE) scores. However, there is no
evidence that this is a reliable indicator of capacity.

Whilst there is no literature looking specifically at the
topic of capacity to create an EPA, there is much research
looking at the effect of the degree of cognitive impairment
on different types of decision-making. MMSE scores were
found to agree closely with expert assessments of capacity
to consent to treatment [2] and the MMSE was found to be
more effective than specifically designed tools in assessing
capacity to create an advance directive [3]. Another study
found that MMSE score was the factor most significantly
related to capacity to consent to research, with a cutoff
MMSE score of 18 yielding a positive predictive value (PPV)
of 95% and negative predictive value (PNV) of 63.3% [4].

However, other authors have reported that the MMSE
was not a useful indicator of decisional ability [5], capacity
to consent to research [6], or capacity to consent to
treatment [7]. Some of this research may not be particularly
relevant to clinical practice, as capacity status was often
determined using specific instruments or neuropsychological
tests, which are not routinely used in clinical practice.
Research on capacity as determined by clinical assessment
may be more useful for guiding decisions in everyday practice.

Aims
This study looks specifically at the area of capacity to create
an EPA. We will investigate if the capacity to create an
EPA, as determined by a clinical assessment, is significantly
related to a degree of cognitive impairment, and whether
MMSE score is a good predictor of a patient’s capacity. We
will also examine whether any socio-demographic factors
(age, gender, education, and qualifications), are related to a
patient’s capacity to create an EPA.

Methods
Study design
Quantitative descriptive cross-sectional study

Participants
Participants were recruited from two old age psychiatry
consultant teams based at the Queen Elizabeth Psychiatric
Hospital, Birmingham, UK. All patients referred to these
two teams between January 2005 and January 2006 with a
DSM-IV diagnosis of Alzheimer’s disease [8] were included.
Patients who did not have a reasonable standard of
spoken English, or suffered from severe expressive/receptive
dysphasia were excluded. Eighty eligible patients were
identified from medical notes and electronic records, and
approached by letter. Informed consent was obtained from
those willing to participate, and carers gave their assent. The
study received Local Research Ethics Committee approval
and NHS Research and Development approval.

Measurement tools
The degree of cognitive impairment was assessed using
the MMSE [9], as this is widely used in clinical practice.
A semi-structured interview to assess capacity to create
an EPA was devised for the study, as there are currently
no validated questions available for assessing this type of
capacity. Its design was overseen by consultants in old age
psychiatry experienced in assessing this type of capacity,
and with reference to guidance published by the British
Medical Association and Law Society [10]. The interview
was designed to test each of the four legal criteria shown
in Appendix 1 (available online). A decision regarding the
patient’s capacity can only be made after completion of the
whole interview. The important points regarding an EPA
were explained to patients in a structured format at the
start of each interview. The explanation of an EPA and the
interview questions used are shown in Figure 1.

Procedure
All participants were first assessed using the MMSE, carried
out by a consultant psychiatrist. This was followed on the
same morning by a semi-structured interview designed to
assess capacity to create an EPA. This interview was tape-
recorded, and another independent assessment of capacity
made by a separate assessor. Both assessors were medical
students who had been trained to assess capacity using the
interview schedule. Where there was disagreement, it was
discussed and resolved. The final decision for each patient
was reviewed by a third assessor, a consultant in old age
psychiatry experienced in assessing capacity to create an EPA,
by listening to the tape-recorded interview. All three assessors
of capacity were blinded to the participants’ MMSE score.
There was a high level of agreement between the students’
assessment of capacity and that of the old age psychiatrist
(κ = 0.83). Socio-demographic data (age, gender, age of
leaving school and presence/absence of qualifications) was
recorded from patient notes.

Statistical analysis
Analysis was carried out using SPSS 10.0. The association
between capacity and degree of cognitive impairment,
genre, and presence/absence of qualifications was tested
using Pearson chi-Square or Fisher’s Exact Test, where
appropriate. Difference in MMSE scores, age, and age
of leaving school in patients with and without capacity
EPA in patients with Alzheimer’s disease

There were no associations between socio-demographic factors and capacity to create an EPA. No association was found between gender and capacity ($\chi^2 = 0.37, P = 0.55$), or between qualifications and capacity ($P = 0.97$). There was no significant difference in age ($U = 602.0, P = 0.58$), or in the age of leaving school ($U = 533.0, P = 0.11$) between patients with and without capacity.

Logistic regression

Logistic regression showed that MMSE score was the only variable to significantly predict capacity (odds ratio = 1.6, 95% CI = 1.3–2.0). MMSE score correctly classified 83.8% of the patients.

Receiver operating characteristic analysis

The area under the ROC curve for the MMSE score as a test to identify incapacity to create an EPA was 0.921 (95% CI 0.863–0.979). Figure 2 shows the ROC curve and is available in the supplementary data on the journal website (www.ageing.oupjournals.org/). Table 2 shows the co-ordinates of the ROC curve. Sensitivity is defined as the ability to correctly identify patients who had the capacity to create an EPA. Specificity is defined as the ability to correctly identify patients who were incapable of creating an EPA. ROC analysis showed that optimal sensitivity and specificity were obtained using a cutoff MMSE score of 18; sensitivity 86.2% (95% CI 67.4–95.5), specificity 82.2% (95% CI 57–88%), PNV 90.2% (95% CI 76–97%), Likelihood ratio for a positive result (LR+ve) = 4.84 (95% CI 2.54–9.24), likelihood ratio for a negative result (LR−ve) = 0.16 (95% CI 0.06–0.42).

Discussion and Conclusions

The degree of cognitive impairment was significantly related to the capacity to create an EPA, and MMSE score significantly predicted capacity to create an EPA. ROC analysis showed that optimal sensitivity (86.2%) and specificity (82.6%) were obtained using a cutoff MMSE score of 18. Since PPV and PNV are dependent on the prevalence of capacity within the sample, the sensitivity and specificity values are more suitable for commenting on the use of the MMSE in assessing capacity in individual cases. None of the socio-demographic factors had any significant bearing on the patient’s capacity to create an EPA. This is surprising, as it might have been expected that capacity level could be associated with prior knowledge of EPAs or experience of other financial matters. Thus gender might have been significant, as most of the patients were from a generation.
R. Gregory et al.

Table 1. Characteristics of participants

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Capacity to appoint an EPA (n = 29)</th>
<th>No capacity to appoint an EPA (n = 43)</th>
<th>Significance test (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male (n = 25)</td>
<td>11 (38%)</td>
<td>14 (31%)</td>
</tr>
<tr>
<td></td>
<td>Female (n = 49)</td>
<td>18 (62%)</td>
<td>31 (69%)</td>
</tr>
<tr>
<td>Median age</td>
<td></td>
<td>79.0 (range = 36 IQR = 73.5–87.5)</td>
<td>81.0 (range = 36 IQR = 76.0–84.5)</td>
</tr>
<tr>
<td>Median MMSE</td>
<td></td>
<td>22.0 (range = 12 IQR = 19.5–23.0)</td>
<td>12.0 (range = 17 IQR = 9.0–17.0)</td>
</tr>
<tr>
<td>Degree of cognitive impairment</td>
<td>Severe (MMSE 1–10) (n = 20)</td>
<td>0 (0%)</td>
<td>20 (45%)</td>
</tr>
<tr>
<td></td>
<td>Moderate (MMSE 11–19) (n = 27)</td>
<td>7 (24%)</td>
<td>20 (45%)</td>
</tr>
<tr>
<td></td>
<td>Mild (MMSE 20–26) (n = 27)</td>
<td>22 (76%)</td>
<td>5 (11%)</td>
</tr>
<tr>
<td>Median age of leaving school</td>
<td></td>
<td>14.0 (range = 5 IQR = 14.0–16.0)</td>
<td>14.0 (range = 10 IQR = 14.0–14.0)</td>
</tr>
<tr>
<td>Qualifications</td>
<td>Yes</td>
<td>7 (24%)</td>
<td>4 (9%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>22 (76%)</td>
<td>41 (91%)</td>
</tr>
</tbody>
</table>

Table 2. Co-ordinates of ROC curve for the MMSE as a test for identifying capacity to create an EPA

<table>
<thead>
<tr>
<th>MMSE cutoff</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>100</td>
<td>57.8</td>
</tr>
<tr>
<td>13</td>
<td>100</td>
<td>60.0</td>
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<td>14</td>
<td>96.6</td>
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<td>15</td>
<td>96.6</td>
<td>66.7</td>
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<tr>
<td>16</td>
<td>93.1</td>
<td>73.3</td>
</tr>
<tr>
<td>17</td>
<td>89.7</td>
<td>77.8</td>
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<tr>
<td>18</td>
<td>86.2</td>
<td>82.2</td>
</tr>
<tr>
<td>19</td>
<td>75.9</td>
<td>88.9</td>
</tr>
<tr>
<td>20</td>
<td>72.4</td>
<td>91.1</td>
</tr>
<tr>
<td>21</td>
<td>51.7</td>
<td>93.3</td>
</tr>
<tr>
<td>22</td>
<td>34.5</td>
<td>100</td>
</tr>
<tr>
<td>23</td>
<td>20.7</td>
<td>100</td>
</tr>
</tbody>
</table>

*Line in bold indicates cutoff value for optimal sensitivity and specificity*

where women often played a lesser role in the management of financial affairs, and so might be less likely to understand the implications of an EPA. However, this was not the case. Age of leaving school and presence/absence of qualifications also had no significant association with capacity. These factors seem to have little bearing on the patient’s understanding of financial matters. It may be more relevant to look at factors such as occupation, socio-economic status or social deprivation scores, as patients with a higher income may have more reason to be familiar with EPAs and their implications.

**Strengths and limitations of the study**

This study was the first to focus specifically on capacity to create an EPA, and used patients suffering from Alzheimer’s disease only, unlike previous capacity studies many of which used patient groups from nursing homes with a diverse range of co-morbidities [3, 7]. The high participation rate (92.5%) means the sample obtained is likely to have been representative. The blinding of the independent capacity raters to MMSE score helped to eliminate bias. Although the interview used to assess capacity had not been validated, there was a high level of agreement between raters, and the use of the semi-structured interview made the capacity assessment as close as possible to the methods used in clinical practice.

The main limitation of the study was that it used only one tool to measure cognitive function, which did not allow for a comprehensive cognitive assessment. Therefore the results would not be generalisable to patients with other forms of dementia, such as frontotemporal or Lewy body dementias, where loss of specific areas of cognitive function, such as executive function, are not reflected by the MMSE score. Future studies could use more detailed cognitive assessment tools such as the Alzheimer's Disease Assessment Scale-Cognitive (ADAS-Cog) [11] to determine which areas of cognitive function (such as verbal memory or frontal executive function) are the best predictors of capacity.

**Implications of the study**

The high levels of sensitivity and specificity obtained suggest that the MMSE could be used as a screening tool to help inform a clinical capacity assessment. However, given the complex nature of capacity, MMSE score should not be used in isolation, and individual assessment of the patient should always be undertaken where possible. However, this is not always possible.
For instance, when the patient has deceased or their mental state has deteriorated since the point of signing, a retrospective assessment will be needed. In these cases, where clinicians can be called upon to act as expert witnesses in legal disputes, the MMSE score could be used to aid a decision regarding the patient’s likely capacity status, with a recognised degree of certainty. The current law governing mental capacity is set to change with the implementation of the Mental Capacity Act 2005 [12], which will replace the EPA with a Lasting Power of Attorney (LPA). The LPA can empower the attorney to make decisions relating to personal welfare and medical matters as well as property and financial affairs. The results of this study are still relevant to patients creating LPAs, but it is possible that an even higher level of capacity would be required to create this more complex and extensive power, so a higher MMSE cut off score might be required to discriminate capacity status.

Acknowledgements

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Key points

- Capacity to create an enduring power of attorney should ideally be assessed clinically, but it is sometimes necessary to assess capacity retrospectively, such as in the event of legal challenges.
- This study aimed to determine if information readily available from patient notes such as Mini-Mental State Examination (MMSE) score and socio-demographic data, were good predictors of capacity to create an EPA.
- The study found that while socio-demographic factors had no association with capacity, the MMSE score was a good predictor of capacity.

Conflicts of Interest

There are no conflicts of interest.

Supplementary data

Supplementary data for this article are available online at http://ageing.oxfordjournals.org.

References


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EPA in patients with Alzheimer’s disease

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