Can Event Related Potentials using a Language Paradigm Help Diagnose Mild Cognitive Impairment?

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**BACKGROUND**

- 16.8% of those over 65 have Mild Cognitive Impairment (MCI) (Graham et al., 1997).
- Semantic memory can be affected in MCI (Joubert et al., 2008).
- Event-Related Potentials (ERPs) are derived from electroencephalogram (EEG) and provide a measure of cortical activity with a high level of temporal resolution.

**METHODS**

- 12 MCI patients from the Bruyère Memory Program and 16 HCs from the general population.
- Cognitive tests: MoCA, RBANS subtests, and Trail Making A & B.
- EEGs were recorded with NeuroScan NuAmps 4.3 and analyzed with Brain Analyzer 2.1.
- Participants indicated if words on the computer screen were repeated or non-repeated.
- N400 waves and Late Positive Complexes from the ERP were analyzed.

**RESULTS**

**Verbal Recognition Performance**

<table>
<thead>
<tr>
<th>Task Condition</th>
<th>MCI (n=12)</th>
<th>HC (n=16)</th>
<th>P</th>
<th>MCI (n=12)</th>
<th>HC (n=16)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Repeated Words</td>
<td>88.1 (11.6)</td>
<td>94.5 (1.7)</td>
<td>.080</td>
<td>1231.0 (219.5)</td>
<td>917.2 (144.7)</td>
<td>.04</td>
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<tr>
<td>Repeated Words</td>
<td>60.3 (12.8)</td>
<td>71.1 (12.9)</td>
<td>.013</td>
<td>1238.2 (219.7)</td>
<td>919.8 (144.8)</td>
<td>.01</td>
</tr>
</tbody>
</table>

**DISCUSSION**

- MCI group performed less well on traditional cognitive testing, was slower and made more mistakes than HC during the verbal recognition task.
- MCI exhibited reduced N400 amplitude and did not exhibit the expected LPC word repetition effects seen in HC.
- Further work will be required to clarify the role of ERPs as a diagnostic tool for semantic impairment in MCI patients.

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