Time Course of Object Naming in Primary Progressive Aphasia

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Introduction
Primary progressive aphasia (PPA) is a neurodegenerative disorder that affects language while sparing other cognitive systems during the initial stages (Mesulam, 2003). Anomia is common in all PPA patients, and the most severe form of anomia is seen in the semantic subtype of PPA (PPA-S). However, agrammatic (PPA-G) and logopenic (PPA-L) variants of PPA, who have relatively spared word comprehension, also have naming deficits thought to stem from faulty word retrieval rather than faulty semantic processing (Mesulam et al., 2009). This study examined the time course of lexical-semantic process of naming in patients with PPA and age-matched normal volunteers using a word-interference paradigm (Schrieffers, Meyer, & Levelt, 1990).

Method
Participants
- 17 age-matched healthy volunteers (age: 50-74)
- 21 patients with PPA
  - 8 PPA-G (age: 52-72, symptom onset: 1.5-5 years)
  - 13 PPA-L (age: 48-76, symptom onset: 2-9.5 years)

Table 1. Language testing data for all participant groups

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>PPA-G</th>
<th>PPA-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAB AQ</td>
<td>99.8 (0.6)</td>
<td>79.5 (3.6)**</td>
<td>95.2 (5.5)</td>
</tr>
<tr>
<td>BNT</td>
<td>98.2 (2.2)</td>
<td>81.9 (17.6)</td>
<td>83.2 (21)</td>
</tr>
<tr>
<td>NNB Noun</td>
<td>99.5 (1.1)</td>
<td>93.5 (5.8)</td>
<td>91.8 (8.1)</td>
</tr>
<tr>
<td>NNB-N/V ratio</td>
<td>1.0 (0)</td>
<td>1.2 (0.2)*</td>
<td>1 (0.1)</td>
</tr>
<tr>
<td>PPVT</td>
<td>99 (1.7)</td>
<td>95.1 (4.4)</td>
<td>96 (5.2)</td>
</tr>
<tr>
<td>NAVS SPPT</td>
<td>100 (0)</td>
<td>48.2 (36.4)*</td>
<td>91.8 (11.6)</td>
</tr>
<tr>
<td>NAVS SCT</td>
<td>100 (0)</td>
<td>79.2 (14)</td>
<td>93.1 (10)</td>
</tr>
</tbody>
</table>

Table 1. Language testing data for all participant groups

Results: Abnormal SI and Cortical Thining in PPA

- Patients with no SI (n=3, 1 PPA-G) vs Patients with SI (n=13, 5 PPA-G)

Results: Semantic Interference (SI)
- Six of eight patients showed SI.

Discussion
- Greater magnitude of SI in PPA compared to controls indicates excessive activation of semantic network or greater vulnerability to distractor interference compared to normal speakers, consistent with greater SI in stroke-induced aphasic patients (Hashimoto & Thompson, 2010).
- The SI effects at the longest SOA of -1000 ms seen in the PPA group, consistent with SI at -750 ms in Vandenberge et al. (2005), suggest even PPA subtypes with preserved word comprehension (i.e., PPA-G and PPA-L) demonstrate subtle, but definite, impairments in semantic processing. The extensive atrophy found in the lateral temporal cortex, the area associated with semantic processing deficits, attests to this conclusion.

References

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