Generative Naming in Amyotrophic Lateral Sclerosis

E. Cooper¹, J.B. Orange², M.J. Strong³, G.M. Grace⁴, A. Rowe⁵, T-Y. Lee⁶, & M. Murphy⁷

Background

- Amyotrophic lateral sclerosis (ALS) affects cognition and can present with frontal lobe dysfunction.
- Dementia also can occur with ALS and is similar to that of a frontotemporal dementia (FTD).
- Language is affected in individuals with ALS with cognitive impairment (CI) and in individuals with ALS-FTD.
- Generative naming is the most common language impairment in individuals with ALS with CI.
- Category specific naming impairments exist in some individuals with selected acquired brain damage. Common category specific impairments include living and non-living items.
- Deficits processing living items have been associated with lesions to left temporal-parietal and parietal-frontal areas.

Purpose

The purpose of this study was twofold:
1. Determine if individuals with ALS exhibit category specific impairments for living vs. non-living categories.
2. How do category fluency performances of individuals with ALS with bulbar onset vs. limb onset change over time.

Research Questions

1. Do participants with ALS vs. controls display category specific naming impairments for living vs. non-living items on category fluency tasks at each of four assessments?
2. How do category fluency performances of individuals with ALS change over time?
3. How do individuals with ALS with bulbar onset vs. limb onset perform on category fluency tasks over time?
4. What is the nature of the errors on category naming fluency tasks among participants with ALS vs. controls?

Method

Participants

- N = 16 participants with ALS and 12 controls - Time 1
- N = 10 participants with ALS and 7 controls - Time 2
- N = 6 participants with ALS and 6 controls - Time 3
- N = 4 participants with ALS and 3 controls - Time 4
- N = 2 participants with ALS and 1 control - Time 5

Procedure

- Data collected as part of a larger, longitudinal multi-disciplinary study investigating cognition and language using convenience sampling of individuals with ALS over time.
- Participants underwent cognitive, neuromotor, neuroimaging, pulmonary and language testing every 6 mos.
- Language testing included standardized (PPVT-III & ABD) and non-standardized procedures and discourse tasks completed in approximately 1.5 hour sessions.
- Primary outcome measure for current study included the responses in each of the 8 category fluency tasks.
- Category fluency tasks based on adapted version of Hodges, Salmon and Butters task used with individuals with Alzheimer’s disease.
- Four living categories (animals, birds, water creatures, and dogs) and 4 non-living categories (household items, vehicles, musical instruments, and tools).
- Number of items, number of errors and types of errors used as outcome measures.
- Perceptual evaluations of intelligibility and speech rate using visual analogue scales completed by 3 blinded listeners.

Data Analysis

- Repeated measures ANOVAs
- Regression analyses
- Calculations of means, standard deviations, standard errors and confidence intervals.

Results

RO1: Individuals with ALS vs. Controls

- NS difference between participants with ALS vs. controls on number of items for living or non-living categories.
- Large variation in performances within the ALS group.

RO2: Changes in category fluency over time

- NS difference in the rate of change over time between participants with ALS vs. controls.

RO3: Bulbar-onset vs. limb-onset over time

- NS difference between the bulbar-onset and limb-onset group on number of items generated or in rate of change over time.

RO4: Error patterns

- NS difference in percentage or types of errors between ALS vs. controls
- More participants with ALS produced semantically related errors vs. controls at Time 1
- ALS sub-group produced significantly more errors in the living categories vs. non-living.

Conclusions

- Semantic errors distinguish ALS vs. controls
- Selective language impairments in some ALS subgroups
- More errors in living than non-living in ALS sub-group

Selected References


Selected References

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