The profile of language impairment in primary progressive aphasia

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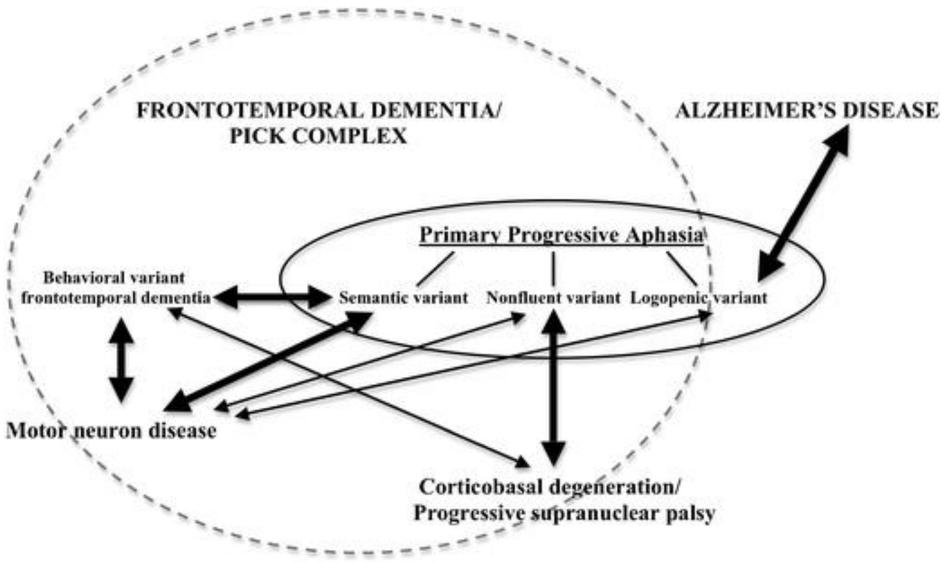
Introduction

Primary progressive aphasia is a neurodegenerative language disorder (Harciarek & Kertesz, 2011). It is characterized by predominant language deficits that may be accompanied by cognitive impairment later in the disease course (Harciarek, Sitek & Kertesz, 2014). There are three clinical variants of PPA: non-fluent variant PPA, logopenic variant PPA and semantic variant PPA.



From: Harciarek & Kertesz, 2011

Hypothesis

The study aimed at comparing the performance of patients with PPA to healthy controls on a variety of language tasks. Those tasks have not been previously validated in Polish for PPA cohort. We hypothesized that a mixed group of PPA patients would obtain lower scores on all language tasks and also on a global cognitive screening task that requires language involvement.

Participants and methods

	Healthy controls (N=25)	Patients with PPA (N=13)
Sex F/M	15/10	10/3
Age	62.20 (±6.62)	66.92 (±8.42)
Years of education	14.22 (±3.10)	12.77 (±2.31)

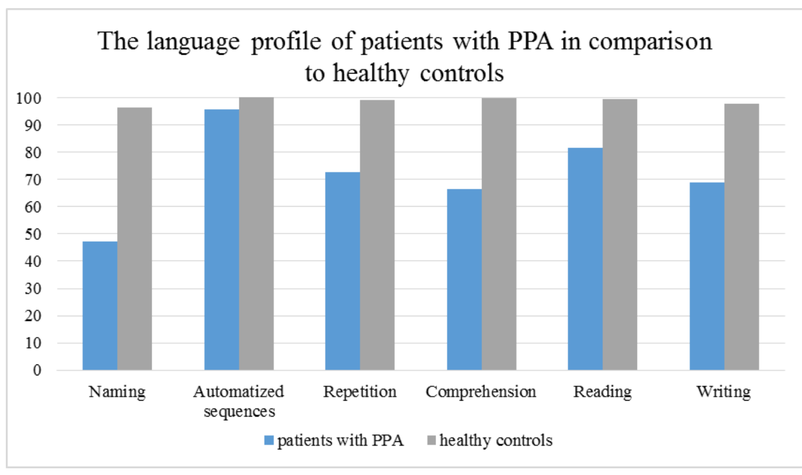
At the assumed level of significance α=0.05 no statistically significant differences were found between the groups for age (p=0.07) and number of years of education (p=0.15).
Among PPA patients there were 5 with non-fluent and 8 with logopenic variant. The patients were diagnosed according to the consensus criteria established by Gorno-Tempini et al. in 2011.
Global cognitive function was assessed with the use of Addenbrooke's Cognitive Examination- III (ACE-III). Language assessment, apart from spontaneous speech included automatized sequence task (months), tests of confrontation naming (Boston Naming Test, Sydney Language Battery-Sydbat), word comprehension and semantic association (Sydbat), sentence comprehension (Commands from Boston Diagnostic Aphasia Examination-BDAE, Token test), word repetition (devised by Szumska), sentence repetition (low-frequency and high frequency phrases from BDAE), word reading (from BDAE, difficult words from the repetition set devised by Szumska), sentence reading (from BDAE) and writing (from BDAE: primer word vocabulary, regular and irregular words to dictation, written confrontation naming, difficult words from the repetition set devised by Szumska).

Results

Test	Healthy controls (N=25)	Patients with PPA (N=13)	Intergroup differences
ACE-III / 100	96[1]	41	U=11.50***
BNT / 30	29	6.50	U=2.00***
Sydney Language Battery			
Naming / 30	29	13.50	U=2.00***
Word Comprehension / 30	30	24	U=7.00***
Semantic Association / 30	30	21	U=15.50***
Verbal fluency			
Letter „K"	19	2	U=3.00***
Letter „P"	19.40 (±6.40)	5.36 (±5.78)	t=-6.23***
Animals	20.96 (±6.34)	6.62 (±7.41)	t=-6.25***
Fruit and vegetables	22.44 (±5.79)	8.82 (±6.16)	t=-6.38***
Token Test / 163	163	154	U=16.50**
BDAE			
Commands / 15	15	12	U=2500***
Automatized sequences months / 12	12	12	U=87.50
Automatized sequences in sec	4.67	19	U=9.50***
Low-frequency repetition / 8	8	5	U=31.50***
High-frequency repetition / 8	8	5	U=39.50***
Word reading / 30	30	29	U=43.00***
Sentence reading / 10	10	9	U=53.50;**
Primer word vocabulary / 15	15	13.50	U=65.50**
Writing to dictation / 10	10	6	U=38.00***
Written confrontation naming / 10	10	5.50	U=15.50***
Difficult word task by Szumska			
Repetition / 10	10	8.50	U=37.50**
Writing to dictation / 10	10	4	U=33.00***
Reading / 10	10	10	U=91.00
Copying / 10	10	9	U=42.50*

[1]depending on the data distribution median or mean +/-SD values are presented in the table

*p<0.05 **p<0.01 ***p<0.001



Due to differences in the span of raw result and the data's lack of normalization, the result are presented as percentages of avarege accuracy.

Conclusions

Patients with PPA achieved significantly lower scores on tests assessing naming, comprehension, repetition, writing and two reading tasks from BDAE. Only accuracy of automatized sequences and word reading from the set devised by Szumska did not differentiate the two groups. The possible explanation for such an outcome are probable difficulties in cooperation between components of mental lexicon in PPA (Sanches, Routier, Colliot, & Teichmann, 2018). The sample size in the clinical group was too small to allow comparison of performance between patients with non-fluent and logopenic variant.

References:
Harciarek, M., & Kertesz, A. (2011). Primary Progressive Aphasias and Their Contribution to the Contemporary Knowledge About the Brain-Language Relationship. *Neuropsychology Review*, *21*(3), 271–287. https://doi.org/10.1007/s11065-011-9175-9
Harciarek M, Sitek EJ, Kertesz A.The patterns of progression in primary progressive aphasia - implications for assessment and management. Aphasiology 2014; 28 (8-9): 964-980.
Sanches, C., Routier, A., Colliot, O., & Teichmann, M. (2018). The structure of the mental lexicon: What primary progressive aphasias reveal. *Neuropsychologia*, *109*, 107–115. https://doi.org/10.1016/j.neuropsychologia.2017.12.018