

Automated analysis of functional written communication and a comparison to spoken communication in the three variants of primary progressive aphasia

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STATE OF THE ART

Despite the important role of written language, abnormalities in written functional communication have been sparsely investigated in Primary Progressive Aphasia (PPA).

METHODOLOGY

We analyzed written and spoken descriptions from a cohort with 20 control participants, 28 patients with nonfluent variant PPA (nfvPPA), 30 logopenic (lvPPA), and 17 semantic (svPPA). We developed a toolbox within the MGH FTD Unit, Quantitext, to automatically quantify total units (U) and content units (CU) of language samples using a language parser and a pre-defined corpus. We then calculated the ratio between both measurements: CU/U Ratio.

RESULTS

Patients with lvPPA and svPPA wrote fewer CU than controls ($p=0.003$); only a trend was observed in patients with nfvPPA ($p=0.14$). All PPA subtypes wrote fewer U than controls ($p<0.001$). The CU/U Ratio was higher in nfvPPA and svPPA than controls ($p=0.019$), but no different for lvPPA ($p=0.962$). Compared to spoken language, patients with lvPPA ($p<0.001$) and svPPA ($p=0.044$) wrote fewer CUs; but again, only a trend in nfvPPA ($p=0.09$). We observed a linear correlation between written and spoken modalities for CU and U in nfvPPA ($r=0.5$ and $r=0.64$ respectively), but not lvPPA or svPPA.

CONCLUSION

We observed a significant decrease in written content in patients with lvPPA and svPPA. Parallel changes between written and spoken language were noted in patients with nfvPPA. This was not the case for lvPPA or svPPA, where there was significant variability with either modality preferentially affected in some individuals. These findings may suggest opportunities for speech-language therapy for PPA.

Conflicts of interest

No conflict of interest.