p-226

Saturday

Brain changes underlying progression of speech motor programming impairment

Ramon Landin-Romero, Ting-Chih Chuang, Cheng Tao Liang, Penelope Monroe, Yuichi Higashiyama, Cristian Leyton, Olivier Piguet, Kirrie Ballard

State of the art: Apraxia of speech, a disorder that impairs speech production despite intact peripheral neuromotor function, is present in patients diagnosed with non-semantic variants of primary progressive aphasia (PPA). Automatic acoustic measures of speech motor programming hold promise as quick and automated methods to improve diagnostic accuracy and disease monitoring in non-fluent variants of PPA.
Methodology: We examined the strength of the pairwise variability index (PVI) and overall word duration as markers of progressive motor programming deficits in PPA patients with apraxia of speech (non-fluent variant=39; logopenic variant=40) matched to 40 healthy controls. Cases were followed-up longitudinally (1–6 years, median 2 years). Assessments included a speech task and MRI. Analyses investigated trajectories of speech production and associations with cortical atrophy and white matter changes.
Results: At baseline, word duration differentiated between patients. Longitudinally, we observed deterioration in PVI and word duration specific non-fluent PPA only. The PVI showed particularly strong associations with progressive atrophy in speech motor programming brain regions and underlying white matter tracts. Of novelty, our results uncovered a key role of the right frontal gyrus in underpinning speech motor programming changes in non-fluent PPA, highlighting the importance of right-brain regions in responding to progressive neurological changes in the speech motor network.
Conclusion: Our findings validate the PVI as a robust marker of apraxia of speech in contrast to more generic measures of speaking rate. Sensitive/specific neuroimaging biomarkers of progression of speech impairments will inform theories of the pathomechanisms underpinning impaired speech motor control.

Conflicts of interest

NA