

Brain and behavioural characteristics of acquired neurogenic stuttering in adults

Acquired neurogenic stuttering (ANS) is a speech disorder that manifests itself in adults as a result of neurological impairment including stroke, traumatic brain injury, brain lesions, medication exposure and neurodegenerative disorders such as Parkinson's Disease. ANS often presents in adults with no history of childhood developmental stuttering. Research has demonstrated, however, that there may be significant overlap in the behavioural symptomology of dysfluencies found in neurogenic and developmental stuttering (1). Moreover, a number of studies completed in our lab has shown remarkable overlap in neural networks involved in both developmental and acquired stuttering. For instance, not only was stroke lesion localization a good predictor of whether stroke patients would develop neurogenic stuttering or not, but these lesion localizations corresponded remarkably well with structural cortical differences observed in adults and children with developmental stuttering (2).

While stroke patients constitute the largest group of adult patients who are at risk of developing ANS, it is not the only group and acquired stuttering has been observed in other patient groups as well (1,3). Some early indications suggest that behavioural characteristics associated with acquired stuttering may differ among various patient populations (4). This raises the possibility that such characteristics could be useful indicators for differential diagnosis and point to improved intervention tailored towards individual patients. The objective of the current study is to review systematically the existing literature as it applies to different patient groups in order to map both differences and similarities among these groups in reported behavioural features associated with stuttering.

The Fluency Lab at the University of Toronto has developed an extensive database of published papers on the subject of ANS. This database summarizes key elements of the papers including among others epidemiology, proposed causal factors, behavioural features and treatment for patients with ANS. As part of the present study, data analysis that is currently underway focuses on disease group and parameters of gender, age,

handedness, cognitive capacity, speech and language, exposure to treatment and stuttering characteristics. Robust neural imaging data is being interpreted to identify commonalities in the neural-underpinnings of acquired dysfluencies.

In the proposed poster presentation, we will provide detailed analyses of the findings, including a discussion of the extent to which reported brain lesions can be linked to specific patient characteristics as well as dysfluent speech patterns. This project will augment and extend previously published research on the subject and will result in an improved understanding of the causes and risk factors for development of ANS in adults following brain injury, as well as provide recommendations for differential assessment and intervention.

References:

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- (2) Theys, C., De Nil, L., Thijs, V., van Wieringen, A., Sunaert, S. A crucial role for the cortico-striato-cortical loop in the pathogenesis of stroke-related neurogenic stuttering (2013), *Human Brain Mapping*, 34 (9), pp. 2103-2112.
- (3) Theys, C., van Wieringen, A., De Nil, L.F. A clinician survey of speech and non-speech characteristics of neurogenic stuttering (2008). *Journal of Fluency Disorders*, 33 (1), pp. 1-23.
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