

Effects of Tissue Volume In the Head of the Caudate Nucleus on Motor Speech Control

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Neurological disorders of the basal ganglia like Parkinson's disease characteristically result in changes in speech. Functional imaging studies using PET and fMRI during speech have specifically identified changes in activity related to speaking rate in the head of the caudate nucleus. Functional and morphological changes in the caudate nucleus have also been implicated in stuttering. In the present study, we made volumetric measurements of the left and right caudate head and examined possible relationships with speech. Volumetric measurements were made.....[fill in details]...

The results revealed symmetrical tissue volumes in left and right side structures, with approximately 50% of the caudate tissue represented on each side. The percent of total caudate volume represented on each side was correlated with measures of speech stability for the production of the syllables /pa/, /ta/, and /ka/. Individual differences in period-to-period variability in vocal frequency on several measures of this phenomenon (jitter) were positively correlated with left caudate volume (range: $r = + 0.564$ to $r = + 0.451$) and negatively correlated with right caudate volume. These results add further support for the concept that morphology plays a role in functional networks.