Attention and language in children from a community with very high incidence of developmental language disorder

Professor of Haskins Laboratories, and University of Connecticut, USA

Searching for genetic bases of language disorders is complicated by diversity of environment and genetics. I will discuss ongoing efforts to gain insights into the neurophysiological and genetic bases of Developmental Language Disorder (DLD) in a Russian-speaking population with an elevated prevalence of DLD (greater than 30%). Due to the relative geographic isolation of this population, children have unusually similar environment and genetic heritage. We have been using neurophysiological measures to gain greater understanding of the nature of language impairments in this population, and as a means to develop more constraining phenotypes for genomic analysis. I will discuss event-related potential (ERP) studies suggesting that children with DLD show intact preattentive phonological discrimination (using the mismatch negativity, or MMN component); reduced amplitudes of the auditory P2 and P3b components in an attentional oddball task; deficits in lexical processing (indexed by the N400 component) potentially mediated by phonological deficits but largely unrelated to deficits in grammatical development; and unusual patterns in a component related to morpho-syntactic processing (P600). A molecular genetic GWAS study identified a novel candidate DLD gene associated with measures of the development of complex syntax. Coupled with the GWAS results, our findings support viewing DLD as a complex common neurodevelopmental disorder linked to variation in nonlinguistic domains, which is multivariate, dimensional and etiologically heterogeneous even when overall heterogeneity is reduced at both environmental and genetic levels.