White-Matter Deficit Seen in Stuttering Children

BY AMY ROTHMAN SCHONFELD
Contributing Writer

ATLANTA — Children who stutter have been found to have deficiencies in white-matter organization in a tract that interconnects the frontal speech/motor planning region and the posterior speech comprehension region, suggesting that inefficient connectivity among speech-relevant regions of the left hemisphere may be a possible neuroanatomical basis for stuttering, Soo-Eun Chang, Ph.D., reported in a poster at the annual meeting of the Society for Neuroscience.

Adults who stutter show the same tract abnormalities as do children, but also show asymmetry in gray-matter volume, suggesting that the gray-matter findings in adults reflect neuroplastic changes secondary to a lifetime of stuttering.

This shows "that the adult studies are compromised because there are two things going on: the original deficit, and then the neuroplasticity that is laid on top of that. This gives us a clear picture of" the actual deficit, Christy L. Ludlow, Ph.D., section chief of the National Institute of Neurological Disorders and Stroke and a coauthor of the study, said in an interview.

In their study, 22 monolingual, right-handed boys aged 9-12 years underwent high-resolution, diffusion-weighted imaging MRI studies. The group was categorized into three subgroups: normal fluent controls (seven), children who showed persistent stuttering (eight), and children who previously stuttered but had recovered and had been fluent for at least 2 years prior to scanning (seven).

Children 'show less volume in both sides of the brain in speech areas.'

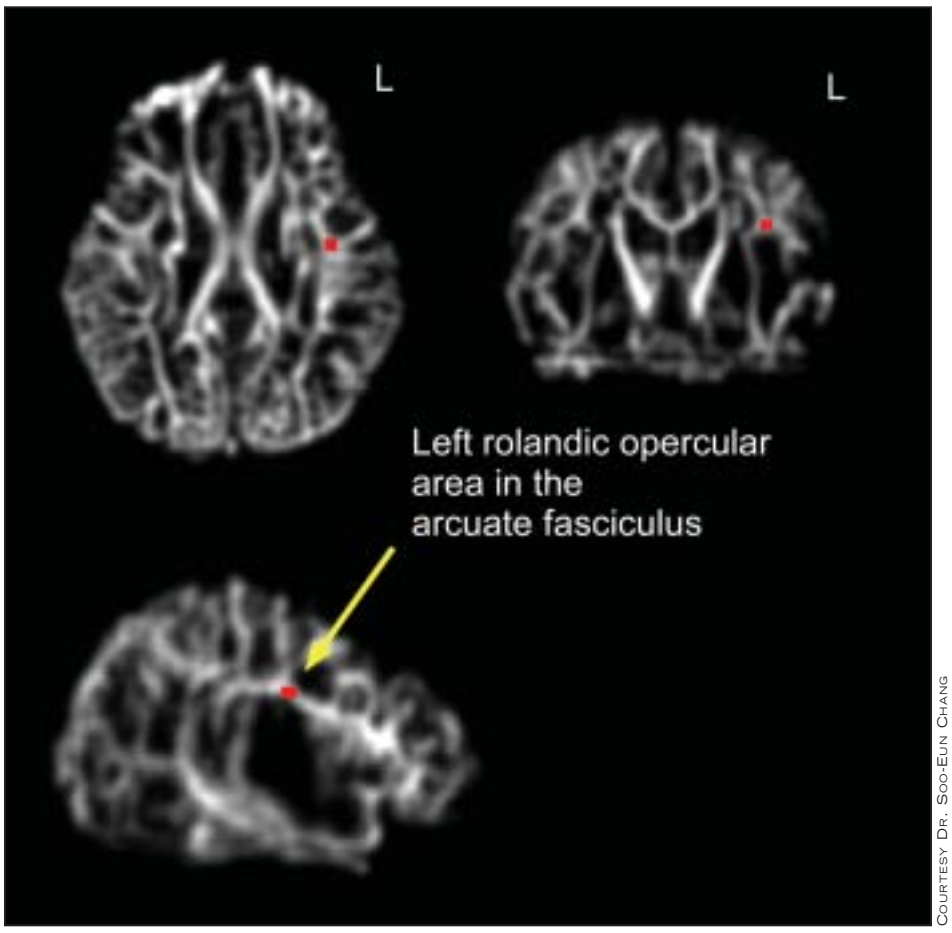
DR. LUDLOW

When compared with normal controls, children who stutter had reduced white-matter integrity only in the left arcuate fasciculus (a tract that underlies the oral-facial motor regions).

Studies by other investigators have shown that stuttering adults manifest increased gray-matter volume in the right hemisphere, whereas fluent adults show greater left hemisphere volume. No such gray-matter asymmetry could be found in children. "In fact, they show less volume in both sides of the brain in speech areas," which suggests that the initial deficit is different from what people see in adults, Dr. Ludlow said.

Interestingly, the left rolandic operculum abnormality was not related to ongoing stuttering, because no difference was found in this region between children who recovered and children who continued to stutter. This may indicate that the abnormality indicates a risk for stuttering, not whether there is a chance of recovery, the investigators noted.

"This is a novel finding because there haven't been any studies to date looking at the brains of children who stutter. . . . Our research suggests that some of the brain-imaging differences found in stuttering adults may be the result of a lifetime of coping with stuttering," Dr. Chang said. ■



COURTESY DR. SOO-EUN CHANG

MRI demonstrates significantly less white-matter integrity in the rolandic operculum in children with stuttering (both persistent and recovered).

Depression History a Possible Marker For Auras Following Epilepsy Surgery

SAN DIEGO — A presurgical history of depression appears to predict the persistence of auras after an anterotemporal lobectomy in which patients became free of disabling seizures, Dr. Andres M. Kanner reported during a poster session at the annual meetings of the American Epilepsy Society and the Canadian League Against Epilepsy.

While the cause of the association remains unclear, one hypothesis is that the aura "may be an expression of epileptogenic activity in the insula, because sometimes the insula can be a culprit in the generation of the aura in patients with temporal lobe epilepsy," said Dr. Kanner, associate director of epilepsy and clinical neurophysiology at Rush University Medical Center, Chicago. "It opens up a lot of questions that I don't have answers for."

He and his associates studied 58 men and 39 women (mean age of 31 years) who underwent an anterotemporal lobectomy at the Rush Epilepsy Center. Of the 97 patients, 60 had mesial temporal sclerosis, 18 had lesional temporal lobe epilepsy, and 19 had idiopathic temporal lobe epilepsy.

All patients had undergone presurgical psychiatric evaluation and had a mean postsurgical follow-up time of 7 years.

Dr. Kanner reported that of the 97 patients, 37 (38%) were free of any disabling seizures and auras since having their surgery, while 43 patients (44%) were free of disabling seizures but had auras. Nearly half of the patients (47) had a lifetime history of depression.

Logistic regression analysis revealed the absence of a lifetime history of depression as the only variable that predicted a seizure-free outcome without auras.

"There is a bidirectional relationship between depression and epilepsy that has been pretty well recognized," Dr. Kanner said. "If you have a history of epilepsy you are more likely to be at risk for depression, and if you have a history of depression you have a four- to seven-times greater risk of developing epilepsy."

—Doug Brunk