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The WCC Note™

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MRI ALZHEIMER'S

Brain MRI Temporoparietal Measurements in Prodromal Alzheimer's Disease

The National Institute for Aging estimates that up to 4.5 million Americans suffer from Alzheimer's disease.[1] To assess the early imaging appearance of the disease, researchers in a multicenter prospective trial led by Boston University followed the brain MRI measurements of various anatomic brain locations over time and correlated them with mental status.[2] As reported in *Neurology*, 16 brain regions of interest underwent MRI scrutiny in 66 subjects. The people who developed Alzheimer's disease over the course of the study displayed greater atrophy rates in six brain areas, compared to those individuals who showed stable, mild cognitive impairment throughout the study. These areas included the hippocampus, entorhinal cortex, temporal lobe, middle temporal gyrus, fusiform gyrus, and inferior temporal gyrus. Those subjects who advanced to Alzheimer's disease over the time frame demonstrated differentially greater rates of atrophy, compared to normal cognitive controls in five of these areas and in the inferior parietal lobe. Correlation occurred between the rate of mental status change and rates of atrophy in these areas. **Conclusion: Brain MRI exams in prodromal Alzheimer's disease show differential rates of atrophy in the temporoparietal regions that correlate with cognitive decline, and carry potential for use as markers in early Alzheimer's disease.**

MRI OCD

Obsessive-Compulsive Disorder Patients and their Close Relatives Displayed Functional MRI Signs

Obsessive-compulsive disorder (OCD) is an anxiety disorder described by the National Institute of Mental Health (NIMH) as recurrent, unwanted thoughts and/or repetitive behaviors.[3] The number of affected American adults age 18 or over approaches 2.2 million, representing roughly 1 percent of people in this age range per year.[4] Symptoms frequently commence in childhood or adolescence, with a mean age of 19. The condition displays a familial link, though studies to investigate the inheritance pattern, thought to be complex and involving multiple genes, have been ongoing in the U.S.[5] In light of this complicated genetic puzzle, researchers at the University of Cambridge (England) sought to identify alternative disease markers using functional brain MRI. The study examined 14 patients with OCD, 12 of their unaffected first-degree relatives, and 15 unaffected matched controls. The participants underwent visual tasks to elicit different components of behavioral flexibility. A recent report in *Science*[6] examines their findings, reporting abnormally decreased activation in several cortical regions, including the lateral orbitofrontal cortex, in OCD patients and their unaffected close relatives. The authors conclude that such brain-based markers may provide powerful assistance in solving the genetic basis of the disorder. **Conclusion: Functional brain MRI demonstrated markers for obsessive compulsive disorder.**

MRI SPINE

First Spinal Cord Genetic Atlas Released

The National Spinal Cord Injury Statistical Center (NSCISC) estimates that as of 2007, approxi-

SPINE

mately 255,702 people in the United States were living with spinal cord injuries. The current widely available imaging methods for such individuals can display their macroscopic cord findings. Such findings reflect the cord's anatomy and histology, the foundation of which ultimately occurs at the molecular level. The more refined imaging can become, the further it can delve into the microscopic cellular and subcellular milieu. As reported in *Nature News*, an ambitious project to map the expression patterns of 18,500 genes in the mouse spinal cord has released data on the first 2,000 of these genes.[7] Ultimately, the Allen Institute for Brain Science plans to release the *Allen Spinal Cord Atlas*, created from 20-micrometer-thick sections at millimeter intervals. The journal explains that pictures will be "resolvable down to one micrometer per pixel of screen – individual nerve cells are upwards of 10 micrometers in diameter." **Conclusion: A new atlas of mouse spinal cord genetic expression holds promise as a reference for normal anatomy, with detail never heretofore accomplished.**

SOURCES:

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NEXT ISSUE: MORE CLINICAL TRIAL IMAGING NEWS AND STUDIES

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