WorldCare Clinical
A PreScan Imaging Company

The WCC Note™

Presented by Stephen J. Pomeranz, M.D.

www.wcclinical.com / +1 617-250-5143 A Weekly Guide To Harmonizing Clinical Trial Imaging

Volume 2, Number 17 – June 25, 2008

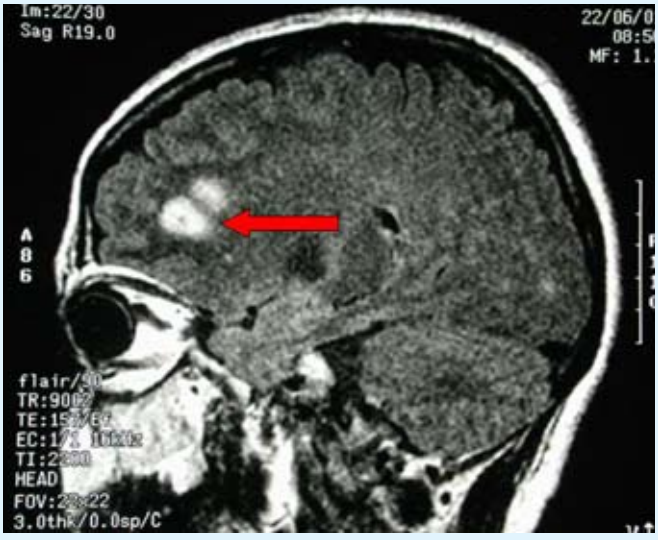
MRI MULTIPLE SCLEROSIS

MRI and Antibody Levels Can Predict Response to MS Treatment

Italian researchers performed a study on 147 patients with relapsing-remitting multiple sclerosis (MS), following them during their first two years of treatment. MRIs were performed at baseline and at three, four, five, and six months after initiation of interferon-beta treatment. These MRIs were evaluated for disease activity, defined as new T2 lesions or gadolinium-enhancing T1 lesions. In addition, anti-interferon antibody (NAb) levels were measured for six months after initiation of treatment. Clinical neurologic assessments were performed every three months for two years, as well as during suspected relapses. They found that the presence of disease activity on MRI and of NAb positivity, when combined, could predict clinical disease activity over the following 18 months with a negative predictive value of 94% and positive predictive value of 50%.[1] **Conclusion: After initiation of Interferon therapy, patients with no new activity on MRI and negative NAb serum tests have less than a 10% chance of developing clinical activity over the next 18 months. In contrast, those with active MRI and positive NAb have a 50% chance of further clinical activity.**

Multiple Sclerosis and MRI: A Review

- Multiple sclerosis is a demyelinating disease, causing damage to myelin, the coating of neurons in the brain
  - MS is an autoimmune disorder that attacks oligodendrocytes, the cells that create myelin
  - The cause is not entirely understood
  - In the Western hemisphere, it is most often seen in young women
- Multiple sclerosis can have a wide variety of neurologic symptoms
  - Symptoms may occur as intermittent attacks (relapsing-remitting form) or as a cumulative process (progressive form)
  - It often presents with visual changes due to optic neuritis
  - Motor and sensory deficits are also common



MRI showing typical MS plaque (arrow).

- MRI is the gold standard for imaging of multiple sclerosis
  - The typical finding is areas of white-matter demyelination in the periventricular area -- these appear as “bright spots” and are best seen on FLAIR images
  - MS tends to involve the corpus callosum and cerebral peduncles

- Optic neuritis can be seen on MRI as inflammation and enhancement of the optic nerves
- The spinal cord is commonly involved
- Contrast-enhanced imaging and diffusion-weighted imaging have been shown to be effective in distinguishing "active" MS plaques from chronic plaques that are not symptomatic
- MRI is often used to show the progression of disease or the response to treatment

BLI

New Bioluminescence Imaging Technique Can Help Determine Effectiveness of Chemotherapy

Researchers from the University of Texas Southwestern Medical Center in Dallas used a substance called luciferin, which emits light when it contacts cells that contain a specific gene carried by fireflies, which allows them to flash. In mice with human breast cancer tumors, the tumor cells were transfected with the firefly gene, then the mice were administered luciferin. Bioluminscence imaging was then used to assess the amount of light emitted from the tumors both before and after administration of a vascular-disrupting drug. Because luceiferin is delivered through the bloodstream, it was postulated that the amount of light emitted would correspond with the vascularity of the tumor. The researchers found that light emissions severely decreased after administration of vascular-disrupting drugs, and that growing tumors emitted increasing amounts of light.[2, 3] **Conclusion: Dr. Ralph Mason, senior author, said "BLI may be an effective and cheaper method to assess drug development and effectiveness… It potentially allows us to do more efficient pre-clinical experiments."**

SOURCES:

1. Durelli L, Barbero P, Bergui M, *et al.* "MRI Activity and Neutralising Antibody as Predictors of Response to Interferon {Beta} Treatment in Multiple Sclerosis." *J. Neurol. Neurosurg. Psychiatry* 2008; 79:646-651.
2. UT Southwestern Medical Center, June 2, 2008. "Fireflies' Glow Helps Researchers Track Cancer Drug's Effectiveness." ScienceDaily.
3. http://www.sciencedaily.com/releases/2008/05/080529091058.htm (retrieved online June 16, 2008).

NEXT ISSUE: MORE BREAKING NEWS AND STUDIES IN CLINICAL TRIAL IMAGING

WorldCare Clinical
A ProScan Imaging Company

THE WCC NOTE™: Volume 2, Number 17 – June 25, 2008

- *Contributing Editors:* Resham R. Mendi, M.D. (newsletter@wcclinical.com) and Stephen J. Pomeranz, M.D. (newsletter@wcclinical.com)
- *Managing Editor:* Rod Willis (newsletter@wcclinical.com)
- *Designer:* Tom Anneken