Researchers Uncover Another Reason Lithium Works for Bipolar Disorder

May 24, 2010

Lithium—one of the most commonly prescribed medications to control mania in people with bipolar disorder—works by altering the brain's metabolism of an omega-3 fatty acid called docosahexaenoic acid (DHA). This new discovery, to be published in the May issue of the *Journal of Lipid Research*, adds further proof to the theory that lithium works by reducing brain inflammation—thus protecting brain cells.

Inflammation is an important bodily response to harm, such as infections and cancerous cells. However, too much inflammation can be harmful. In other parts of the body, chronic inflammation can lead to arthritis and colitis. In the brain, inflammation is tied to Alzheimer's disease. Researchers have proposed that inflammation might also cause manic episodes in people with bipolar disorder—by damaging neurons—but the exact mechanism by which this occurs is still not fully understood. Previous research indicated that lithium lowers inflammation by reducing arachidonic acid, an inflammatory enzyme, but researchers suspected that the drug had other methods of working.

To explore the link between lithium and inflammation, Mireille Basselin, PhD—from the National Institute on Aging, at the National Institutes of Health (NIH) in Bethesda, Maryland—and her colleagues used a mass spectrometer to examine the brain chemistry of two groups of rats with brain inflammation. One group had been given lithium, while the other had not.

Basselin's team found that the rats on lithium had an increase of a metabolite called 17-OH-DHA in their brains in reaction to stress. This metabolite is formed from DHA, a fatty acid found in fish, algae and certain nuts, all of which have anti-inflammatory properties.

Thus, lithium appears to have a doubly protective effect on inflammation, both by reducing arachidonic acid and increasing 17-OH-DHA. These findings, according to the authors, could indicate other uses for the drug as well.