

Evolutionary Psychiatry

Tuesday, July 27, 2010

Lithium and Inflammation

Lithium is an interesting sort of mineral salt. It sits on the [periodic table](#) right above sodium, and can fool our kidneys into thinking they are the same molecule. Scientists first figured out lithium could help stabilize mood in the late 1800s (when it was also used to treat gout). And, turns out, El Paso, Texas has high levels of lithium in the water, but low rates of violence and mental hospital admissions compared to other cities (1). Lithium was the original "up" ingredient in 7-UP soda (pretty sure lithium is not in there anymore!). The [first research paper on lithium](#) didn't appear until 1949, when Australian psychiatrist John Cade made his mark on psychiatric history. However, Greek physicians thousands of years earlier were treating mental disorders with mineral water now thought to be high in lithium.

Before John Cade, mania was treated with electroshock therapy or lobotomy, so lithium was a terrific option - in fact it was the first successful pharmaceutical treatment for mental illness ([thorazine](#) wasn't used for several more years). It has huge downsides - toxic to the thyroid and kidneys (and heart in high amounts), fatal in overdose, and a lot of the time it simply doesn't work. But when lithium does work, it is a wonderful thing. Suicidal depression and mood swings relieved within days. To this day, lithium is one of the few medications proven to decrease the risk of suicide (3).

Despite the fame and long term, widespread use, no one knew what the heck lithium actually did. In medical school, I was taught that it had some effect on the regulation of second messenger systems within the neurons (4). Meaning, like every other psychotropic medication, it buffs up the communication in the brain, presumably to help it work all the more smoothly. (We psychiatrists have almost no lab tests and no imaging studies to help us - we just have to sit with someone and figure out what might be going on. A handicap which lends itself to the search for holistic, evolutionary solutions - but everyone knows my bias!)

The good Dr. Hale sent me a link to [this article](#) in Psychiatric News, which sheds more light on lithium's possible mechanisms of action. The article references [this paper](#) in The Journal of Lipid Research, and the story herein involves more unfortunate rats.

We learn first of all that bipolar disorder is a major mental illness worldwide, and is characterized by mood shifts from severe depression to mania. Examination of the post-mortem frontal cortex of those with bipolar disorder shows an increase in

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About Me



Emily Deans

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I'm a psychiatrist in
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searching for evolutionary solutions to the general and mental health problems of the 21st century.
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Of Like Minds

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neuroinflammatory markers (I'm sure you're not surprised), and an increase in the enzymes that regulate the expression of arachidonic acid. (Arachidonic acid is the highly-unsaturated fatty acid (HUFA) made from the omega 6 polyunsaturated fatty acids (omega 6 PUFAs), otherwise known as essential nutrients but Standard American Diet Villain Extraordinaire).

In this study, rats were given lithium-laced food or lithium-free food for 6 weeks, and then their little brains were examined to see what happened (sorry, they did not use non-invasive methods. The rats were anesthetized, however, before the final insult.)

To summarize the results - lithium decreases arachidonic acid in the brain and increases the concentration of an antiinflammatory metabolite of DHA (yes! Fish oil!). 17-OH DHA inhibits all sorts of other inflammatory proteins in the brain, like TNF-alpha. (For the biochemistry nuts - LiCl seems to intervene at the level of cPLA2 and sPLA2 and COX). Famous inflammatory modulator aspirin has been postulated to help lithium work better in bipolar disorder (5)

Interestingly enough, lithium has been shown to be the only effective drug (at least to slow the progression down) in another inflammatory, progressive, and invariably fatal neurotoxic disease, ALS (6), and is being studied in HIV dementia and Alzheimer's disease.

Posted by [Emily Deans](#) at 7:53 PM



4 comments:



[ewparadise](#) February 28, 2011 at 11:52 AM

About 20 years ago, I met a woman when I was in treatment who had been prescribed lithium to treat bipolar disorder or some such (she had PTSD, was a trying to recover drug addict, etc., etc.). After going on the drug, she gained 30 lbs and developed a flat affect (so much so that she reminded me of a photograph--she looked like a human figure, but was only two-dimensional). It "cured" her of her suicidal tendencies, but took away an essential quality of her humanity. My doctor now wants to prescribe lithium to me to help me overcome suicidal tendencies and severe depression, but after seeing that woman, I am scared of the drug and have refused to take it. I have a couple kids and for their sake, want to do everything to keep from committing suicide, but for me Lithium is the last step before committing myself to an asylum. What are your thoughts?

[Reply](#)



[Emily Deans, M.D.](#) February 28, 2011 at 12:12 PM

I can't give personal medical advice. If a medicine makes someone numb and zombie-like, it is not the correct medicine for that person. There are plenty of lively people on lithium. Hopefully you can discuss this very frankly with your doctor and have your personal questions attended to.

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Personal Blogs of Paleo-



alternefit July 13, 2011 at 11:23 PM

As I mentioned in another post comment, I was diagnosed with bipolar years ago when I lived in MN. I no longer eat in the manner I did then, and this has completely turned me around! I no longer suffer the mood swings and anxiety that so often accompany bipolar disorder. I remember when the doctors wanted to give me lithium, I was terrified and horrified. Instead of doing that, I chose a holistic doctor to help me...and he did...but it was the change in lifestyle that really put me on a fast-track toward health! I also remember that there was a nurse in the care facility I worked for that said to me, "Oh, you should take the lithium because that just means your brain doesn't create enough!" I remember thinking to myself, "Uh, what?! I don't think this is a lithium deficiency going on...last time I checked, I don't recall anyone having too little lithium production in their bodies!" I believe bipolar and other mood disorders can absolutely be linked to lifestyle...and I feel I am proof of that! Thank you for what you are doing, Dr. Deans!

Reply



isohappy February 1, 2013 at 5:21 PM

Lithium orotate has been a Godsend to me. I take 10 mg a day, along with antidepressants. Antidepressants have been helpful in the past but I may be experiencing a "poop out" effect since I have been taking them so long.

On a cruise two months ago, I ran out of lithium and I could really tell the difference! I was getting very touchy, thin-skinned and miserable. Lithium keeps me at an even keel, for which I am very grateful. I have heard before that lithium orotate is being used as a longevity drug. I think that being in a consistent good mood fosters relationships, which may be responsible for some of the antiaging effect, since it has been proven that a network of relationships and socializing with people slows the onset of senile dementia. Also, when you are in a good mood, you're more physically active.

Interestingly, in Chinese herbal medicine, certain minerals are used to stabilize mood. I wonder if there may be a trace of lithium in the minerals they use.

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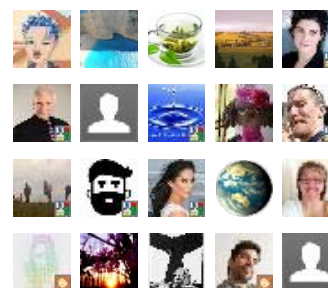
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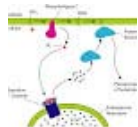
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