

BIOELECTRIC LITHIUM COMPOUNDS

PROBLEM

For the last fifty years or so the drug of choice for recurrent bipolar illness management and in particular mania, has been Lithium [1]. Lithium's physiologic role is unknown, and its mechanism is not yet understood [2]. This mystery is a suspicious smelling mystery. For one, Lithium in its prescribed forms is a simple molecule compared to more complex later generation medications which are typically much better understood for the same tools used to study Lithium so far. This would suggest that the process of study or attention is flawed. To that effect, Lithium is neither metabolized nor protein-bound [3]. What makes it work?

HYPOTHEIS

The pharmacodynamic effects of Lithium are second to the electro-neurodynamics of Lithium; that is bioelectricity is the key to understanding Lithium derived medications in the body.

Lithium chloride for example is an ionic compound. Lithium is a metal while chloride or carbonate as it is often attached to are a non-metals. Electrons are transferred from metal ion to non-metal ion in bonding [4]. After being dissolved in a solution the Lithium molecules can carry extra charge, absorbing electricity from around it. Because the body and in particular the nervous system is a hotbed of electrical activity, activity is lessened by the interception or absorption of electrons by the Lithium, which would have otherwise traveled down an axon and/or contributed to a direct or sympathetic action potential; so that the lessening of electrical activity is not a result of reducing mania by chemical action, but a chemical which reduces mania by lessening electrical action.

Funny story, I called a major local university about this and their biology and chemistry departments sent me to each other. Not only that, but many people who deal with electricity for a living don't have a solid grasp of it, and physicists are mostly on to things other than psychiatry. In this way, the mystery of psychiatric Lithium is a bit like an accident on the freeway where everyone assumes everyone else has dialed 911. Low hanging but forgotten fruit?

POTENTIAL DYNAMICS

In 1858 the trans-Atlantic cable failed due to a conductive metal sheath built around the cable as armor. This failure is due to that EMF travels as waves which extend beyond the insulated body of the conductive wire, resulting in interference from the sheath. I believe it's possible that Lithium which has been distributed across the body absorbs or interferes with electrical activity even within cells or axons from outside them. Aside from the lessening of mania, "symptoms of intoxication include coarse tremor, hyperreflexia, nystagmus, and ataxia [5]. Could this represent a breakdown in cellular ability to properly electrically signal across neural networks?

In the heart, "almost all patients treated with Lithium will develop T wave flattening. Sinus node dysfunction is the most common reported conduction defect followed by QT prolongation, intraventricular conduction defects, and U waves." [5] Could this be dampening of the cardiac electrical signal not unlike the signal fade with the trans-Atlantic cable?

TESTING

If the primary action is the subtraction of electrons, then all the testing you would need to do to show it is measuring the lessening of electrical activity in the brain through EEG which has already been done. Saying this is not enough to make the point is like saying black holes don't exist because we can't see them. It may also be possible to measure the Lithium compound charge after being excreted to see if it carries more energy after being excreted than when ingested.

REFERENCES

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