Editorial

Lithium as a Dietary Supplement

Mental disorders account for 40% of causes of disabilities in the developing world as well as in the United States [1]. It is also estimated that approximately 25% of adult Americans suffer from some form of mental illness, including major depression, bipolar disorder, schizophrenia, and obsessive-compulsive disorder [1]. These disorders may be treated with antidepressant medications or lithium. Although the use of lithium is on the decline to treat mood disorders [2], lithium remains to be a successful treatment of affective disorders (unipolar, bipolar, and schizoaffective illness) in young and older patient populations alike [3,4]. It often produces positive results and augments antidepressant-resistant unipolar major depressive disorder [5,6]. It is estimated that about 80% of patients with mania (i.e., bipolar) respond to lithium therapy in the acute phase [4]. Affective disorders are commonly associated with severe morbidity and mortality-related suicide [4,7]. Lithium therapy has been shown to reduce the risk of suicide in patients with mood disorders, in particular, those with unipolar and bipolar mood disorder patients [5,8]. A 12-hour plasma lithium concentration of 0.5-0.7 mmol/L has been established to be the most effective [8]. This therapeutic range may be established by a daily lithium dose of 900 mg [6]. Although this therapeutic range of lithium does not produce significant side effects [3,8], it is considered to be narrow, and thus, it is subject to result in some form of toxicity (75% of patients on long-term lithium therapy will experience some toxic effect) [8]. Lithium neurotoxicity can occur within the therapeutic levels, which may include neuroleptic malignant syndrome (altered mental status, autonomic dysregulation, fever, and muscular stiffness) [8]. Elderly patients may be more susceptible to the neurotoxicity, and thus, they should be given a lower lithium dose to avoid it [9]. Much of the toxicity of lithium may be attributed to drug overdose, dehydration, and pharmacokinetic interactions with other drugs (angiotensin receptor blockers, non-steroidal anti-inflammatory drugs, and diuretics) [8]. Lithium renal clearance can be reduced with age, and therefore, the dose of lithium should be lowered with advancing age in order to avoid toxicity [10]. Based on a Safety Data Sheet (SDS) available on the Internet [https://www.nwmissouri.edu/naturalsciences/sds/l/Lithium%20carbonate.pdf], lithium is available as lithium carbonate salt with a solubility in water of 8.4 g/L at 20 °C. A 1 g/L solution in water produces a pH of 9.0-11.0 at room temperature. Lithium carbonate is the most common form of lithium salts available for therapy. Lithium side effects following a high dose include a dulled personality, memory loss, reduced emotions, tremors, and weight gain [1]. It is interesting to note that 80% of bipolar patients have some vitamin B deficiencies [1]. Although the role of side effects remains unclear with lithium therapy adherence, it is estimated that over 40% of patients who are on lithium therapy are classified as non-adherent [2]. Lithium is available on the market as capsules, solutions, immediate-release, and extended-release.
Dietary supplements of lithium are available on the market. These include products- containing lithium in the form of a liquid ionic form (500 mcg/10 drops), tablets (10 mg of lithium orotate), and capsules (lithium orotate 5 mg; lithium aspartate 5-10 mg), among others. Although the dose of lithium in these supplements is much lower than that found in pharmaceuticals, overdosing with the supplements can produce mild tremor with severe nausea and vomiting that may require emergency medical attention [13]. Also, supplementing with dietary lithium products can cause drug/supplement interactions, and therefore, it must be communicated to health care providers. For instance, lithium interacts with the antibiotic metronidazole, and replacement antibiotic must be given instead when needed [14]. The use of dietary lithium products by the public is commonly cited for its potential known positive effects on depression and suicide prevention [15]. Moreover, lithium is believed to enhance cognitive ability and to reduce the incidence of dementia [15]. Long-term treatment with lithium in older adults who had amnestic mild cognitive impairment showed a definite improvement in cognitive functions as well as modifications of cerebrospinal fluid biomarkers associated with Alzheimer’s disease [16]. However, it should be noted that a significant lowering in kidney concentrating ability may be encountered in the long-term lithium-treated patients [17]. In the form of lithium orotate, lithium is readily available in its ionic form following its dissolution in water. According to an SDS [http://materie-prime.farmalabor.it/sds/01412_en.pdf] for lithium orotate, the salt is white crystalline powder with a neutral odor having a flashpoint greater than 300 °C. The salt is slightly soluble in water at room temperature. Incidentally, the orotate ion can cross the blood-brain barrier more readily and quickly than the carbonate ion, and thus administering lithium as orotate is a better and more efficient way for therapy [1]. The orotate form also allows a lower dose of lithium while reducing the possibility of side effects development [1].

In conclusion, the dietary supplement form of lithium (lithium orotate) appears to have some beneficial effects for maintaining a healthy mood provided the patient coordinates their use of this supplement with a primary health care provider.

References

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