

## **Orthomolecular Medicine Biochemistry or Bust: Do 'Restorative' Regimens Treat Disorders of Metabolism?**

In the early 1950s, Dr. Abram Hoffer and his team developed the little-known specialty which Dr. Linus Pauling, PhD, later named 'orthomolecular' medicine. Hoffer discovered that regimens of vitamins, minerals, amino acids and other supplements could help patients with disorders of metabolism.

Hoffer's interest in treating schizophrenia developed as he considered a disorder of adrenalin metabolism which he could have called hyperaminochromia, but Hoffer did not use that word. Instead, he proposed an adrenochrome hypothesis. Hoffer's colleague, Dr. Humphry Osmond, considered it an aminochrome hypothesis. At that time, Hoffer did not link orthomolecular medicine with clinical biochemistry, another little-known but quickly-developing medical specialty that concerns itself with 800 or so disorders of metabolism, many of which are treated conventionally by using therapeutic doses of vitamins, minerals and other nutritional supplements.

According to what Hoffer and Osmond and their orthomolecular colleagues learned when they researched and developed optimum regimens, including vitamin therapy, to treat seriously-ill mental patients whose symptoms included psychosis, hallucinations, disorders of perception, depression and anxiety, the human body has five ways to dispose of adrenalin. The built-in multiple metabolic capabilities are necessary because too much adrenalin can stop the heart. The activating effect of a surge of adrenalin gives human beings a survival opportunity, enabling them to either fight off predators (threats) or run away. However, since an overload of adrenalin can kill a person, it is important for the human body to allow surges of adrenalin only briefly, as and when necessary to fuel a fight or flight response.

According to Hoffer's aminochrome hypothesis, a small minority of people – 1 to 2% – are vulnerable to schizophrenia, i.e. psychosis. Hoffer proposed that those pa-

tients have a disorder of adrenalin metabolism. They produce two aminochrome by-products, inconvenient oxidative metabolites of adrenalin, from one of their five life-saving adrenalin-clearing metabolic pathways. Hoffer's research discovered that two of those aminochrome compounds were hallucinogens and depressogens—adrenochrome and adrenolutin. According to Hoffer's adrenochrome hypothesis, some patients produce those two aminochrome compounds rather than the usual by-product of that 5th adrenalin metabolism pathway – leucoadrenochrome, which has calming effects.

This very brief overview of Hoffer's important work does not properly describe the biochemistry involved with decades of Hoffer's important work, but this example does illustrate that Hoffer considered the life science of biochemistry a fundamental basis for orthomolecular medicine. Few clinicians have PhDs in biochemistry, and therefore to this day, many clinicians do not understand the basis for Hoffer's adrenochrome hypothesis or know about the history or the development of 'restorative' orthomolecular medicine. Even so, 'modern' psychiatrists typically prescribe cocktails of brain pills and claim that those medications can balance, help or heal brain chemistry when patients present with schizophrenia, psychosis, hallucinations, depression or anxiety.

Over time, it seems likely that successive generations of researchers will discover that many other disorders of metabolism are involved with mental diagnoses such as 'depression', and determine which orthomolecules can heal those disorders of metabolism, i.e., so patients can restore and maintain normal metabolism. Presumably future research will further explain how and why ortho-regimens work safely and effectively, as vitamins B<sub>3</sub> and C do according to Hoffer's adrenochrome hypothesis.

Hoffer reasoned that in patients with hyperaminochromia, an optimum dose of vitamin C reduces their oxidation of adrenalin and an optimum dose of vitamin B<sub>3</sub> reduces their formation of adrenalin. Therefore, Hoffer's two-vitamin treatment regimen for

schizophrenia, using an antioxidant and a methyl acceptor had two healing effects, useful for patients prone to hallucinations.

Other patients, e.g., those with pellagra, a nutritional deficiency, could not function normally after the depletion of essential nutrients such as tryptophan and niacin stopped their biochemistries from working properly. Left untreated, pellagra patients became depressed and anxious, then they developed serious symptoms. Thousands of pellagrins died before the 'restorative' benefits of supplementing with a balanced diet, then tryptophan and vitamin B<sub>3</sub> was discovered by Goldberger and other researchers in the early 1900s. Fascinating to read about their work, which Dr. Hoffer did as he considered the biochemical basis for psychosis and developed his orthomolecular approach, using optimum doses of vital amines and other supplements, i.e., orthomolecules, to help patients recover and live well.

Orthomolecular medicine could be considered a branch of clinical biochemistry because orthomolecular regimens offer important and restorative benefits as outlined above: (1) Orthomolecules can restore healthy levels of essential nutrients in starving patients; and (2) Orthomolecules can treat patients who have disorders of metabolism. As Hoffer proved in the early 1950s, optimum doses of two vitamins can optimize the metabolism of adrenalin if patients have a specific disorder of adrenalin metabolism, which could have been called hyperaminochromia but which Dr. Hoffer called schizophrenia (although in his later years, he wondered whether a different name for that diagnosis would be kinder and less stigmatizing; I suggested 'pellagra type 2').

Dr. Jonathan Prousky's article in this issue of JOM confirms that orthomolecules and regimens of orthomolecules are known to help patients recover and live well, even though the specific disorders of metabolism involved with 'depression' and most other common mental symptoms have yet to be identified. Prousky's article encourages clinicians to consider the psychoactive effects of orthomolecules and prescribe restorative

regimens, without waiting for decades until researchers discover more disorders of metabolism.

Psychiatric medications are routinely prescribed to vulnerable mental patients even though most 'modern' psychiatrists still do not know the biochemical, metabolic or other underlying reasons why some patients get depressed, overly anxious or hallucinate. The mechanisms of action of most of those brain pills remain unknown, but trusting patients get them anyway, based on simplistic and unproven claims that psychiatric medications can restore neurotransmitter imbalances, etc.

Orthomolecules prescribed by orthomolecular clinicians offer healing benefits but since orthomolecules are 'normal' to the human body, orthomolecular medicine can help to restore and maintain normal biochemistry, safely and effectively, without producing the problematic side effects, adverse effects and drug-induced neurological disorders associated with commonly-prescribed psychiatric medications.

Opponents of orthomolecular medicine do not seem to know about the fascinating field of clinical biochemistry. Those doubters, deniers and quack hunters dispute, disparage and deny the relevance of biochemistry but open-minded individuals trust that Hoffer had the right idea when he suggested leaving the door open to the future of orthomolecular medicine by maintaining its fundamental connection with the life science of biochemistry and encouraging orthomolecular clinicians and researchers to keep researching and considering whether specific disorders of metabolism are involved with mental health problems such as 'depression' and meanwhile encouraging orthomolecular clinicians (existing and new) to use orthomolecules because of their safe and effective 'psychoactive' effects; benefits which have helped hundreds of thousands of patients to recover and live well over the past 60 years.

Readers who are not biochemists do not have to believe naysayers or doubt the biochemical-benefit premise of Hoffer's important work. Instead we can read and learn about the biochemical basis for orthomo-

lecular medicine. Over his six-decades long career as a physician-psychiatrist-researcher-educator-author-editor, Hoffer wrote a series of books, hundreds of articles for medical journals and many editorials for the Journal of Orthomolecular Medicine. Hoffer's writing explains his theories, his research and the development of 'restorative' orthomolecular regimens so clearly that even patients as well as clinicians and researchers can learn about restorative orthomolecular medicine. Hoffer's scientific memoirs, *Adventures in Psychiatry*, encourages researchers to take his important work forward by discovering more disorders of metabolism

and determining the biochemical bases for the health-restoring benefits of orthomolecular regimens.

Many of Hoffer's books, articles and editorials still read fresh and clear today. They are still relevant and still inspiring. My book, *Remembering Abram Hoffer by Reviewing his Books about Psychiatry: Biochemistry, Research and Clinical Practice*, lists some of Hoffer's many excellent books, reviews selected titles and provides cover images of Hoffer's most important books which are still available as affordable used books from amazon.com or abebooks.com. My book is available free from [www.searpubl.ca](http://www.searpubl.ca).

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