

# What if nutrients could treat mental illness?

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Editor's Choice

We are at a tipping point in psychiatry. With few psychiatric drugs on the horizon and long-term studies suggesting medication may do more harm than good, it is time to revisit the very old idea that nutrition can have a positive effect on mental health. Knowledge of the importance of nutrition for health is said to go back at least 2700 years, to Hippocrates. But based on our twenty-first-century scientific information, how powerful is the nutritional approach?

For over a decade, researchers have been publishing treatment studies that show improvements in symptoms of irritability, anxiety and depression when people ingest various mineral and vitamin formulas as supplements to their diet. A randomised placebo-controlled trial (RCT) in the *British Journal of Psychiatry* this year (Rucklidge et al., 2014), documented that adults with attention deficit hyperactivity disorder (ADHD) consuming a broad spectrum of nutrients showed greater reduction in ADHD symptoms than those taking placebo, with medium-to-large effect sizes. For a subgroup who entered the trial with moderate-to-severe depression, there were twice as many going into remission in the micronutrient group compared with the placebo group. In addition, the benefits of micronutrients continued through the 1-year follow-up. We have also published results using multinutrients from experimental designs that showed on-off control of symptoms,

studies of people whose post-traumatic stress and anxiety following earthquakes in New Zealand were significantly reduced, and database analyses of adults and children whose symptoms of bipolar disorder substantially decreased (Rucklidge and Kaplan, 2013). There are now over 20 placebo-controlled RCTs showing the benefit of multinutrients in treating stress, anxiety, aggression in prisoners, low mood, autism and ADHD (Rucklidge and Kaplan, 2013).

Other research, especially from Australia and Europe, has supported the link between nutrition and mental disorders by showing that diets higher in vegetables and fruits are associated with lower depression and anxiety, whereas diets low in vegetables and fruits and higher in processed foods are related to higher rates of depression and anxiety (Jacka et al., 2012). Although most of these diet-mental health epidemiological studies have employed cross-sectional designs, some have been longitudinal and have demonstrated that the diets low in vegetables and fruits and high in processed foods have preceded clinical diagnoses of mood and anxiety disorders (Jacka et al., 2012).

Why might adding multiple nutrients in combination influence mental health? Most scientific methodology alters a single variable at a time so it is worth considering the justification for multinutrient supplementation. Every neurotransmitter goes through many metabolic steps to ensure its

synthesis, uptake and breakdown. Every step requires enzymes, and every enzyme is dependent upon multiple coenzymes (cofactors). A variety of minerals and vitamins are required as cofactors in most if not all of those steps. One possible mechanism underlying psychiatric symptoms is inborn metabolic dysfunction associated with slowed metabolic activity due to suboptimal availability of mineral and vitamin cofactors. Impaired brain metabolic activity connected with other disorders has been shown to be correctable through nutrient supplementation (Ames et al., 2002). Multinutrient supplementation could provide sufficient cofactors that even enzymes with drastically reduced activity become so supersaturated that near-normal function is restored. Alternative mechanisms have been hypothesised as explanations for the effect of nutrients on brain function, such as improved energy metabolism including increased mitochondrial

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production of adenosine triphosphate (Rucklidge and Kaplan, 2013).

It is possible that diminished nutrient content of our food supply might play a role in the success of these broad spectrum nutrient formulas (Rucklidge and Kaplan, 2013). Data indicate that the minerals and vitamins of fruits and vegetables have decreased significantly, partially as a result of the poor remineralisation of the soil. It is possible that some individuals are highly sensitive to these nutrient depletions, as biochemical needs are known to vary across people.

As micronutrients cannot be patented and regulations on micronutrient formulas are variable, companies have little to gain by funding clinical trials. The RCT mentioned above was mostly funded by private donations, and the research continues to be dependent on the generosity of private donors. If there were additional RCTs funded of both paediatric and adult psychiatric symptoms, or of children who are at risk of developing psychiatric disturbances, we could generate much more knowledge about the potential value of various combinations of minerals and vitamins for preventing and treating mental illness. The potential societal benefit of this inexpensive treatment is profound: for saving lives, restoring families, preventing job loss and saving our healthcare dollars.

Clearly, nutrient supplementation will not benefit everyone, but currently we do not even have sufficient information as to who might benefit. In the largest of our studies thus far, approximately 50% of both adults and children experienced a 50% reduction in bipolar symptoms after 3 months consuming a multinutrient formula, an improvement sustained at 6 months. Although that improvement seems modest, it is comparable (and occurs

with no side effects) to the improvements attainable through psychopharmacology. As current estimates are that 30–40% of Western populations will experience a significant mental disturbance at some point in their lifetime, our societies may be missing an opportunity to assist millions of people at little cost.

It would be relatively cheap to discover the magnitude of potential benefit from multinutrient treatment. As nutrients do not cause adverse events, people do not drop out of studies very often. The lack of turnover means that multinutrient formulas can be studied fairly quickly and efficiently. Everyone wants to reduce the burden of the epidemic of mental illness. The time seems ripe to invest public funds in assessing the extent to which multinutrient treatment and/or diet manipulation may improve mental health in our society.

Slow acceptance of nutritional interventions is not unusual (Berwick, 2003). Captain James Lancaster carried out a cohort study in 1601, which showed that lemon juice prevented scurvy. In a voyage from England to India, sailors on one ship took daily lemon juice and those on the other three did not. Halfway through the voyage, none of those on the ship taking lemon juice had died, whereas 40% of the sailors on the other three ships had perished. The experiment was repeated 146 years later in 1747 by James Lind, a physician. Despite the evidence, practices did not change. It took another 48 years for the British Navy to order citrus fruits be provided on navy ships; however, universal preventive policy was not enacted for another 70 years when the British Board of Trade adopted the innovation (Berwick, 2003). In other words, 264 years passed from the first trial to the change in national policy.

One situation that contributes to slow acceptance of new data is the

circumstance of new findings not fitting existing theoretical frameworks. With the establishment of the International Society of Nutritional Psychiatry Research (ISNPR), and the important studies on oxidative stress, inflammatory activity and mitochondrial dysfunction being carried out by ISNPR researchers, the theoretical framework for understanding the aetiology of mental illness is changing. The growing body of literature on the effect of nutrients on mental health is compelling enough and consistent enough for us to pay attention. It is time to revisit the role of diet and supplementary nutrients in the treatment of mental illness and to invest in this line of research.

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