

The Antiseptic

Estd. 1904

Indexed in
IndMED



A MONTHLY JOURNAL OF MEDICINE AND SURGERY

Email: admin@theantiseptic.in

www.theantiseptic.in

Vol. 119 • No. 5

MAY 2022

ISSN 0003-5998 • ₹ 100



COVID Fear and Paranoia

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PANDEMIC PREVENTION CENTER	
LAB RESULTS SARS-COV-2	Date: 03-03-2020
Severe acute respiratory syndrome coronavirus 2	
Name: JANE DOE	Test: COVID-19
EXAMINATION	POSITIVE
COVID-19 VIRUS	NEGATIVE
Body Temp-	36.5°C(97.7°F)
Respiratory	



Nutraceuticals in Psychiatry

SANJAY AGARWAL

Nutraceuticals¹ are a newly added concept to our day-to-day life. What are nutraceuticals, why did the concept arouse, why do we need them? To understand better let's dive in.

Mental disorder is a widespread subject including a large range of disorders including derangement in the thoughts, emotions, behavior, and relationships with others. The current treatment includes antipsychotics, antidepressants, sedatives, hypnotics, mood stabilizers, etc. Studies reveal a significant relationship between mood disorders and diet. On the other hand, this opens an avenue for treating the adverse effects of medications.

According to WHO the mental disorders are classified into psychotic and non-psychotic disorders. Psychotic disorders are classified into organic and nonorganic disorders. One of the most common classifications of mental disorders is an anxiety disorder. Anxiety, normal reaction of humans to stress, can be beneficial in some situations. Anxiety disorders are the most common disorders and affect 30 percent of adults. Another common disorder is obsessive-compulsive disorder-another common mental disorder in which the patient has long uncontrolled recurring thoughts and behavior which urges the patient to do actions repeatedly. Attention deficit hyperactivity

disorder is the most prevalent mental disorder in children which starts in childhood and continues in adulthood. It is associated with problems like inability to concentrate; hyperactivity and impulsive behavior's current treatment of ADHD² are medicinal therapy, behavioral therapy, parent education. Another most affecting disease in adult life that has depression according to the duration of the illness. Current treatment of depression include medication, psychotherapy, and brain stimulation therapy

Before jumping off to the topic of nutraceuticals it is essential to establish the correlation between food³ and the nervous system, rather the moods of an individual. Several studies have shown that food affects the moods of the individual e.g., fruits and vegetables are known to elevate the mood. Dietary flavonoids present in fruits, vegetables reduce the risk of Alzheimer's disease. Citrus-derived flavonoids Hesperidin is known to have an anticholinergic and antioxidative effect also act in case of depression by modulation of receptors in the Hippocampus. Another most important nutrient affecting the nervous system is Vitamins. Vitamin D acts in cases of OCD by acting on the pathway of serotonin and catecholamine synthesis; many more foods can be added to the list of drugs which act on the nervous system affecting the moods of a person.

Gut microbiota play an important role in the regulation of serotonin metabolism. Alteration in the good and bad bacteria in the gut is known to have mood and cognitive dysfunctions. Probiotic-

rich fermented food is known to maintain healthy gut flora. Several studies show that the consumption of probiotic help in patients suffering from anxiety and mood. Vegetarian diets are known to reduce inflammation in the gut.

Opposite to a healthy diet, there are some foods known to harm the nervous system. Diet rich in sugars and fatty acids have a negative impact on brain cells. Neutrophins protect brain cells from damage due to the oxidative process and promote the growth of new brain cells. A high incidence of ADHD is seen associated with consumption of food rich in high fatty acids and sugars.

The term nutraceuticals were coined by Stephen Defelice in 1989. Over the years the concepts about nutraceuticals have changed. In the modern lifestyle due to the use of chemicals, loss of nutritive properties of the soil, and sedentary lifestyle, the nutritive value of the foods we consume daily have reduced leading to deficiency of the nutritive components essential for bodily metabolism and functioning. Here the role of nutraceuticals comes into play. Nutraceuticals are substances that provide an additional health benefit which include prevention and treatment of disease. Nutraceuticals help in the antiaging process, prevent chronic disease, increase life expectancy, and improve bodily function.

Nutraceuticals may include ingredients like minerals, vitamins, amino acids, a medicinal herb, or a dietary ingredient that acts as a supplement. Most chronic and lifestyle diseases are due

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Specially Contributed to "The Antiseptic"
Vol. 119 No. 5 & P : 06 - 08

to deficiencies or causes related to nutrition. Nutraceuticals play an important role in premature chronic disease. Fortification of foods such as table salt, cooking oils which are fortified with iodine, vitamin A has been in the use as supplements to avoid deficiency of these nutritive agents.

Various psychiatric disorders have been associated with various biochemicals functioning in the body. The deficiency of nutrients such as omega-3 Fatty acids, minerals complex, has been proved to have a role in psychiatric disorders. The role of serotonin in depression is a well-researched topic in the current day. Some other cases like deficiency of DHA (Docosahexaenoic acid) in pregnant mothers have been found to play role in the prevalence of ADHD in the children. Evidence of vitamin B deficiency in bipolar disease is found in many cases. Thus, consumption of a diet rich in omega -3 fatty acids, minerals, vitamins has been found to have a reduced prevalence of psychiatric disorders.

Another factor that is of utmost importance to explain nutraceuticals is their safety. Nutraceuticals have been found to have no side effects except some gastrointestinal discomfort when taken in a small amount. Studies have shown an association of excessive use of folic acid with carcinogenic effects in the case of folic acid supplements, excess folate levels are associated with prostate cancer. Higher doses of omega-3 fatty acids are associated with impaired immune function, impaired lipid, and glucose function. Vitamin A supplementation is known to aggravate the risk of lung cancer, prostate cancer and increase the mortality risk in those patients. Excessive use of

minerals and vitamins increases the risk of hyperchromatism, hypervitaminosis in the case of vitamin A.

A wide range of nutraceuticals is available which are used in the management of psychiatric disorders. Let us discuss them in detail –

Omega-3 fatty acids⁴ –

Omega -3 fatty acids are essential polyunsaturated fatty acids found in the dietary sources mostly found in the Fish. This leads to anti-inflammatory and antithrombotic effects by cytokine production. In cases of bipolar disorders, Omega -3 fatty acids help by reducing the intensity of intracellular signal transmission which helps in mood stabilization. In most psychiatric disorders the levels of Omega -3 fatty acids are reported to be low.

In children suffering from writing disorders, dyspraxia, ADHD related symptoms, supplementation with Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) helps in the management of these cases.

Vitamins^{4,5} - The role of Vitamins in neuropsychiatric patients has been proved to be of utmost importance. The deficiency of vitamins such as folate, niacin, thiamine has been known to adversely affect the neuropsychiatric system. Various vitamins help in the formation of other nutraceuticals e.g., Folate and Vitamin B 12 are necessary for S- adenosyl-L-methionine (SAM) which act has anti-inflammatory and analgesic properties. It acts as a powerful antidepressant compared to Tricyclic antidepressants. Folate deficiency is associated with a higher prevalence of psychiatric disorders in the elderly. Homocysteine levels are associated with cognitive

function. High homocysteine level is associated with decreased cognitive function and dementia. Folate supplementation helps to reduce the levels of homocysteine. Vitamin B12 is a water-soluble vitamin synthesized in the body, mostly acquired from meat products leading to a tendency of deficiency in the vegetarian population. The main function of vitamin B12 is RBC production, neurological functioning. The deficiency of vitamin B12 shows symptoms such as irritability, memory loss, tingling, and many other symptoms. Cobalamin is vital for the formation of monoamine neurotransmitters in the brain. Thus, a strong correlation is found between vitamin B12 and mental disorders.

Vitamin D⁵ is the most important in brain function. Serotonin is synthesized in the brain from tryptophan through a vitamin D mediated cycle. It has been proved that inappropriate levels of Vitamin D, EPA, DHA are associated with disturbance in the serotonin function in the brain. A scientifically proven correlation has been on sleeping patterns and vitamin D levels in the body. A study conducted revealed that people on supplementation of vitamin D are known to have better sleep quality and duration. Vitamin D activity is involved hypothalamic-pituitary-adrenal axis modulation which is involved in epinephrine, nor-epinephrine, dopamine thus vitamin D deficiency has symptoms such as irritability, anxiety, depression, psychosis, and mental development deficit.

Mineral⁶ - Micronutrients are associated with the development of structure and function of the brain. Zinc is associated with cell development and cell proliferation. The deficiency of zinc is

associated with declined cognitive function and degeneration. Effects of zinc, magnesium are involved in attention, executive function, behavior, and emotional problems also have been observed in the case of children and adolescents; Children suffer from ADHD and other attention deficit disorders. Another aspect of zinc supplementation is that over-accumulation of zinc leads to neurotoxic damage to the postsynaptic neurons

Iron is necessary for oxygenation and energy production in cerebral parenchyma, synthesis of neurotransmitters, and myelin. Iron supplementation in pregnant women is associated with the development of the fetus as well the IQ of the newborn. Women suffering from depression are mostly mothers having iron deficiency anemia which establishes the correlation between iron deficiency and depression. Rapid fatigue, and apathy are the most common symptoms of iron deficiency anemia.

DHEA - Dehydroepiandrosterone (DHEA)⁷ is another steroid hormone produced by the adrenal gland on stimulation by ACTH which helps in the production of estrogen and testosterone. In the brain, it enhanced the function of glutamate which is an excitatory neurotransmitter, and reduces the function of GABA which is an inhibitory neurotransmitter. DHEA levels are deranged in patients suffering from post-traumatic disorder. Overconsumption of DHEA leads to weight gain, voice changes, hirsutism in females and gynecomastia, and enlargement of the prostate in the males due to increased levels of estrogen and progesterone. Studies show that DHEA reduces the activity in the area with negative emotions. DHEA acts in the brain by

having regulatory control over human emotions thus helping in the cases of anxiety, fear, etc. Patients with posttraumatic stress disorder have high levels of DHEA due to extreme stress situations. Thus DHEA is used in cases of anxiety, mood disorder, Post-traumatic stress disorder (PTSD) thus acting by controlling the emotions and reducing memory accuracy for emotional stimuli.

Choline - Choline^{8,9} is an important nutrient found in sources like liver, fish, eggs, etc. as well as is produced in the body. Choline is the precursor of acetylcholine which is a neurotransmitter for the transmission of nerve impulses. Choline metabolites are essential for the maintenance of cell membrane integrity and signaling during the development of neuron cells. Choline helps in the functioning of cognitive function and memory. Choline is also helpful in early brain development, cell membrane signaling, lipid transport, and metabolism. In cases of Alzheimer's, the lesions of Alzheimer's disease are associated with choline acetyltransferase activity in the hippocampus. Studies have shown improvement in verbal memory in the dementia system.

Tryptophan and HTP- Tryptophan help in enhancing the neurotransmission of serotonergic transmission in the brain. A very small amount of tryptophan from the diet is used for the formation of 5 HT in the brain. Other amino acids act as a competitor for tryptophan to pass the blood-brain barrier which acts as a limitation to the use of orally consumed.

Thus, a well-defined role of nutraceuticals has been established and proved. Nutraceuticals when combined with other therapies have been proved beneficial.

Although supplementation has been advised in psychiatric illness overdose should be avoided which may lead to addiction, toxicity, etc. In the future, the avenues of a combination of nutraceuticals may open, and the inclusion of food with nutraceuticals improves the quality of food. Finally, nutraceuticals are just supplemented, for the proper functioning of the mind and body. Nutraceuticals should be advised along with a balanced diet, healthy lifestyle, rest, and psychosocial interventions.

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Long-term use of proton pump inhibitors is associated with increased risk of development of CKD.

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