Nutraceuticals to Prevent Brain Disorders

In recent years, interest in the use of nutraceuticals has risen substantially, largely because of their safety, adequate efficacy, and potency [1]. Nutraceuticals is a broad term that describes products, which other than nutrition are also used as medicine. The ‘Nutritional Psychiatry’ is a new field of research focused on the role of diet and nutrition in mental health [2].

Good nutrition and healthy lifestyles are important not only to prevent mental disorders but equally during treatment of brain disorder to improve patient’s response to treatment. Most brain disorders can be prevented by adopting healthy dietary habits and lifestyle modification (i.e. physical activity, exercise, meditation, diet, and restriction of caffeine, alcohol, and nicotine [2,3]). Amongst the ‘nutraceuticals and functional foods’ recommended for the prevention of mental illnesses include, but are not limited to, nutrient-dense foods (vegetables, fruits, and fish), Mediterranean diet, Olea europaea, and Nigella sativa [4]. A traditional Mediterranean diet, for instance, appears to have prophylactic benefits against anxiety, depression, and dementia [5]. Mediterranean diet includes higher intakes of fruits and vegetables, cereals with limited processing, fiber, fish, seafood, and only modest amounts of dairy and lean meats. Specific items within traditional dietary patterns (soy foods, honey, turmeric, blueberries, and pomegranate) have been individually associated with protection against depression and, experimentally, these components have also demonstrated antidepressant properties. The isolated polyphenols and different phytochemicals within these foods have likewise been reported to provide anti depressive properties in experimental models. In addition, specific nutrients, for example, magnesium, zinc, vitamin C, folic acid, and vitamin B12, have additionally been associated with resiliency against depression or improvement in depressive symptoms [6].

It has been reported that Olea europaea (olive) oil, a major component of the Mediterranean diet also has neuro protective effects [1]. Nigella sativa, commonly known as Black cumin or Black seed, has been traditionally utilized for culinary and therapeutic purposes [1]. Several studies showed that Nigella sativa has neuro-protective effects [7] as well as protects against memory impairments [8]. Thymoquinone, the main active component of Nigella sativa have also shown neuro protective effects [9].

Nigella sativa and Oleauro Pae produce their beneficial effects through the modulation of neurotransmitters in the brain. These neurotransmitters in turn alleviate depression, anxiety, and help in memory enhancement [1]. On the other hand, diet, physical activity, exercise and smoking may influence mental health through various distinctive pathways, including via alteration of neurotrophins critical to depression [10]. Thus nutraceuticals and functional foods have the potential to stimulate the central nervous system and protect the brain against various damages [8]. The philosophy behind the use of nutraceuticals is to focus on prevention of disease, as said by Hippocrates “let food be your medicine” [11].

Nutraceuticals for the Treatment of Brain Disorders

Healthy dietary habits and good nutrition can help patients deal with the effects of mental disorders and their treatment. Most prescription drugs, such as antidepressants, antipsychotics, anxiolytics, and psychostimulants produce side effects [12]. This usually causes noncompliance in patients. An alternate for psychiatrists to overcome this noncompliance is to utilize safe alternative or complementary nutritional therapies [13]. Promoting an increased consumption of nutrient-dense foods may be a helpful strategy in the prevention and treatment of mental disorders [10,14].
Moreover, taking healthy nutrition such as supplements containing amino acids have also found to reduce symptoms of depression and mental illnesses. Dietary supplements containing tyrosine and phenylalanine cause alertness and arousals. Omega-3 fatty acids in fish oil have been found to elicit antidepressant effect and are also used as an adjunctive therapy for mood disorders. Fish oil supplementation may also offer a safe strategy for attenuating post-traumatic stress disorder [15]. Folate and vitamin B12 can also be used to decrease the symptoms of depression. These foods facilitate the production of neurotransmitters in the brain. The neurotransmitters in turn alleviate depression and other mental illnesses [13].

It has been reported that Olea europaea oil also has anxiolytic, antidepressant, and memory enhancing effects [1,16]. It has been shown that Nigella sativa has anxiolytic [17], antidepressant [18], as well as nootropic effects [1]. Thymoquinone have also shown improvement of stress-induced impairment of memory [19]. Nigella sativa might be a potential source for developing new drugs for treating anxiety and stabilizing mood and improving cognition in adolescents [1,20].

On the other hand, a ‘processed food’ pattern (sweetened desserts, fried food, processed meat, and refined carbohydrates) is positively related to the risk for later depression [4]. Unhealthy maternal and early postnatal dietary patterns (processed and refined foods, high-sugar beverages, and high-sodium snacks) elevate the risk of behavioral and emotional problems in children [21]. The increasing availability of highly palatable diet and sedentary life style is of great concern in the epidemic of obesity and depression worldwide [22-23].

Conclusion

The emerging field of Nutritional Psychiatry offers much promise for identifying and addressing the large disease burden associated with mental disorders that account for the leading disability burden globally. Evidence suggests that majority of nutraceuticals possess multiple pharmacological properties to help treat brain disorders. However, clinical studies on the use of these nutraceutical compounds in preventing and treating brain disorders are lacking. Evidence-based research on nutraceuticals being marketed is needed to develop effective strategies for treatment of mental disorders.

References

