

COVID-19 related stress in epileptic patients vs. “antioxidants and exercise”

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Epilepsy is a neurological disorder, characterized by spontaneous recurrent seizures, that affects 65 million population globally and accounts for approximately 1% of the total world population [1]. It has been reported that epilepsy causes memory impairment such as attention deficit, learning disabilities, visuo-spatial skills deficiency [2]. The prevalence of depression in epilepsy ranges between 20-60% and anxiety between 15-20% [3].

Currently, the Coronavirus disease 2019 (COVID-19) spreading globally, characterized by high fever, cough, and difficulty in breathing. It was initially spread in Wuhan, China at the end of 2019 [4]. COVID-19 has affected the quality of life around the globe. There are various stressors associated with the coronavirus that could aggravate seizures in patients suffering from epilepsy. The stressors include restrictions in social gatherings, anxiety, and stress created by COVID-19 and associated changes in the lifestyle schedule, and economic instability due to the lockdown [5]. Stress, depression, and anxiety have been known as precipitating factors that aggravate seizures in

epileptic patients [6]. It was reported that stress causes the generation of oxidants in the brain leading to seizures-induced brain damage in epileptic conditions. Furthermore, memory impairment is the most debilitating comorbidity associated with epilepsy along with depression and stress that may worsen cognitive decline [7].

Stress is very much common in epileptic patients as they fear getting a seizure at any time. COVID-19 caused an overall stressful situation for every individual in society and for those who are prone to it. It has been reported that stress weakens the immune system of the body thus during a COVID-19 stressful environment, epileptic patients are at higher risk of getting the virus. Huang et al. reported that stress due to COVID-19 in epileptic patients exacerbated seizures [8]. Therefore, there is a great need to care for epileptic patients in these difficult times so that their seizure frequency could be restricted due to all these stressors. This can be done by proper counseling to maintain the proper mental health to reduce stress. They should manage stressors through meditation while staying at home, reducing the social media that created panic-like conditions by giving superfluous information about COVID-19. Similarly, light exercise is considered to be very beneficial in epileptic patients by decreasing stress and modulating the stress hormones, so they should be advised to critically follow the guidelines of exercise [9].

Antioxidant-Rich Diet vs. Stress

There are multiple ways through which stress can be ameliorated in epileptic patients such as through exercise, a healthy diet, and counseling.

Consumptions of fruits are very beneficial in reducing oxidants produced by chronic stress. As we know that stress trigger seizures in epileptic patients thus there should be regular consumption of fruits that are rich in antioxidants. Vitamin C, E, polyphenols, and melatonin are proven effective

in combating oxidative stress and alleviating convulsions [10]. Oranges, Kiwi fruits, and grapefruits are rich in vitamin C, while hazelnuts wheat germ oil, almonds, and sunflower oil are rich in vitamin E. Further, vitamin C has proven to be very effective in preventing damage to the hippocampus during seizures in an epileptic patient [11]. Therefore, vitamin C-containing fruits should be given to epileptic patients in this pandemic to boost their immunity and decrease oxidants. Polyphenols-containing products are peppermint, cloves, and chestnuts [12]. Similarly, melatonin-containing products include fenugreek seeds, St. John's Wort, and mustard seed [13]. In the current pandemic, these products should be used by epileptic patients to reduce stress related oxidative damage and aggravation of epileptic seizures. Oxidative stress reduces the immunity of the body [14] therefore vitamins and antioxidants play a key role in protecting the oxidative stress-induced damage to the brain. Furthermore, epileptic seizures also produce reactive oxidative species that damage the brain therefore utilizing antioxidants containing food may protect against these damages.

Exercise vs. Stress

Exercise has many beneficial effects on epileptic patients [15]. During COVID-19 pandemic, epileptic patients are in a state of depression and anxiety. This depression lowered the immune system and may make these patients vulnerable to getting the infection. Therefore, light exercise may prevent depression by enhancing mood-stabilizing hormones such as serotonin levels in the hippocampus and also normalizing dopamine levels in the brain. During stressful condition, cortisol is released which negatively impact memory thus leading to memory impairment. Exercise decreases the cortisol level [16] and also enhance memory performance by preventing memory loss due to raised cortisol level in the brain [17]. Furthermore, cortisol also disrupts the antioxidant

defense in the brain. Thus, antioxidants combined with light exercise may improve the quality of life of epileptic patients in this pandemic situation.

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