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The Combined Therapeutic Role of Spirulina in Neuropsychiatric Health and Psychotropic Medication-Induced Metabolic Syndrome

Zahra Nazari Taloki [1,2,*], Maryam Nyiasti [3]

[1] Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
[2] Department of Clinical Pharmacy, School of Pharmacy, Babol University of Medical Sciences, Babol, Iran
[3] Student Research Committee, Babol University of Medical Sciences, Babol, Iran

[*] ***Corresponding Author:*** Department of Clinical Pharmacy, School of Pharmacy, Babol University of Medical Sciences, Babol, Iran. Email: zahra_nazari_taloki@yahoo.com

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Dear Editor,

The occurrence of metabolic syndrome among individuals with neuropsychiatric disorders is significantly high, indicating a notable comorbidity that adversely affects overall health outcomes. Current research generally indicates that metabolic syndrome impacts roughly 20% to 40% of patients suffering from severe mental illnesses such as schizophrenia, bipolar disorder, and major depressive disorder (1). This increased prevalence is primarily linked to psychiatric treatments — particularly atypical antipsychotics and selective serotonin reuptake inhibitors (SSRIs) — as well as lifestyle factors and the underlying pathophysiology of these conditions. These medication-related side effects not only elevate the risk of cardiovascular diseases but also frequently contribute to poor adherence and discontinuation of treatment (2).

Consequently, there is growing interest in discovering safe and well-tolerated adjunct therapies to mitigate these complications. In this regard, Spirulina stands out due to its broad therapeutic benefits. Beyond its positive effects on neuropsychiatric symptoms, Spirulina's notable impact on metabolic syndrome suggests it may help reduce or prevent medication-induced adverse effects in this population. Spirulina, a cyanobacterium, is abundant in bioactive substances including phycocyanin, polyphenols, β-carotene, γ-linolenic acid, and antioxidant enzymes like superoxide dismutase (SOD) and catalase. These components exhibit potent anti-inflammatory and antioxidant properties by inhibiting the NF-κB and COX-2 signaling pathways and lowering inflammatory cytokines such as TNF-α and IL-6 (3).

This is especially important given the roles of neuroinflammation and oxidative stress in the development and progression of psychiatric disorders and their treatment-related complications. Recent studies also indicate that Spirulina offers mitochondrial protection by enhancing ATP production and minimizing oxidative damage to mitochondria — factors closely associated with fatigue, cognitive impairment, and mood disturbances observed during prolonged psychotropic medication use (4-6). Additionally, Spirulina's prebiotic effects have attracted attention for their role in modulating the gut-brain axis. Its ability to beneficially modify gut microbiota correlates with improved mood, decreased systemic inflammation, and better metabolic health (7-9).

Clinical evidence further supports Spirulina's effectiveness in improving metabolic syndrome components such as hyperlipidemia, hyperglycemia, and hypertension — all commonly seen in patients undergoing long-term psychopharmacological treatment (10). These outcomes align with broader treatment goals that aim to enhance mental health while protecting against metabolic and inflammatory side effects induced by medications. Given its multiple mechanisms of action — including anti-inflammatory, antioxidant, metabolic regulation, and gut-brain axis modulation — Spirulina emerges as a promising nutraceutical candidate for psychiatric patients vulnerable to chronic adverse effects.

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We advocate for future clinical trials to rigorously evaluate Spirulina's role as an adjunctive therapy in standard psychiatric care, particularly for individuals with coexisting metabolic syndrome or those receiving long-term antidepressant or antipsychotic medications. We commend your journal for promoting this complementary therapeutic approach and believe that further clinical investigation into Spirulina could significantly broaden integrative treatment options in mental healthcare.

Footnotes

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