

LETTERS TO THE EDITOR

The relationship between stress and vitiligo during COVID-19 pandemic

Sir,

Vitiligo is the most common acquired depigmentary disorder characterized by the development of pale white spots that can occur on any part of skin or mucous membrane. This condition affects almost 0.5% of the world's population and is more common in black people.¹ Although exact pathogenesis is not well understood, two important factors, that is, increased oxidative stress and autoimmunity, are implicated in its development. Melanocyte apoptosis and the production of cytotoxic T cells due to oxidative stress are suggested to play a role in the destruction of melanocytes.² Sunburn or some chemicals trigger the production of free radicals. In susceptible individuals, it activates the immune system and triggers specific cytotoxic responses in melanocytes. Higher catecholamines, neuropeptides, and cortisol levels in vitiligo indicate their role in the pathogenesis. Stress can increase the levels of these chemicals. HMBG1 and keratinocytes play a potential role in melanin production. They are also effective in the persistence and expression of melanogenesis-related molecules. External stressors such as UVB cause oxidative stress, which in turn stimulates the release of HMGB1.² HMGB1 increases the secretion of chemokines from keratinocytes and increases the maturation of dendritic cells in vitiligo.³ Oxidative stress reduces glutathione peroxidase. Decreased serum levels of glutathione peroxidase are associated with the inflammatory response of vitiligo. IL-15-induced oxidative stress in keratinocytes activates CD8 + TEM cells and expresses cytotoxic proteins in vitiligo.⁴ Cellular stress increases DAMPs, which leads to the migration of dendritic cells and macrophages and the delivery of antigens to tissues.⁵ With the development of vitiligo, oxidative stress increases, but antioxidants do not increase accordingly. Decreased antioxidant capacity due to stimulation of keratinocyte proliferation promotes vitiligo.⁶ Significant number of vitiligo patients have diverse psychological problems. Hormonal response to psychological stress such as cortisol has a role in the development of vitiligo. Physical or environmental stress is involved in the onset and disease progression. Psychological stresses can also contribute to the onset and progression of vitiligo. Vitiligo itself can also increase the psychological distress of patients. Stress is higher in patients with vitiligo who have lesions in their exposed areas. Patients with vitiligo patients have impaired quality of life. Patients suffering from vitiligo and other skin disorder at the same time may also have more psychological stress. All these factors underline the role of psychological and oxidative stress in the pathogenesis.

Coronavirus disease (COVID-19) pandemic has caused significant psychological problems including increased stress level, depression, post-traumatic stress disorder, and insomnia among varied groups of people including medical professionals, those in other essential services, students, elderly, housewives, and also general population.

COVID-19 caused by the severe acute respiratory syndrome virus (SARS-CoV-2) is a complex disease associated with interactions of virus several host cells including cells of the immune system. COVID-19 is also associated with oxidative stress. Altered immune response and inflammatory cytokine in patients with COVID-19 are associated with oxidative stress. Although large epidemiological studies are not available, psychological stress and oxidative stress seem to share a common link between COVID-19 and vitiligo. Hence, it seems prudent to hypothesize that COVID-19-induced stress (both psychological and oxidative stress) may trigger the development of vitiligo in susceptible patients. We strongly feel that patients with known risk factors for vitiligo should be carefully followed and counseled for stress management during COVID-19 pandemic. We also suggest that further studies analyzing the relationship between the pathogenesis of COVID-19 and vitiligo are necessary.

DISCLAIMER

We confirm that the manuscript has been read and approved by all the authors, that the requirements for authorship as stated earlier in this document have been met, and that each author believes that the manuscript represents honest work.

AUTHOR CONTRIBUTIONS

GRR, AG, AK, ZZ, ML, and MG contributed conceptualization of the idea. All authors (GRR, AG, AK, ZZ, ML, AP, and MG) contributed to literature search, draft preparation, and editing the manuscript. All authors have approved the manuscript.



ETHICAL APPROVAL

Not applicable as the research did not involve humans/animals.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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