Emotional Health and Immunity during COVID-19 pandemic

By-
Dr. Hem Chandra Jha
Asst. Professor,
BSBE, IIT Indore, India
Date- 16th May 2021

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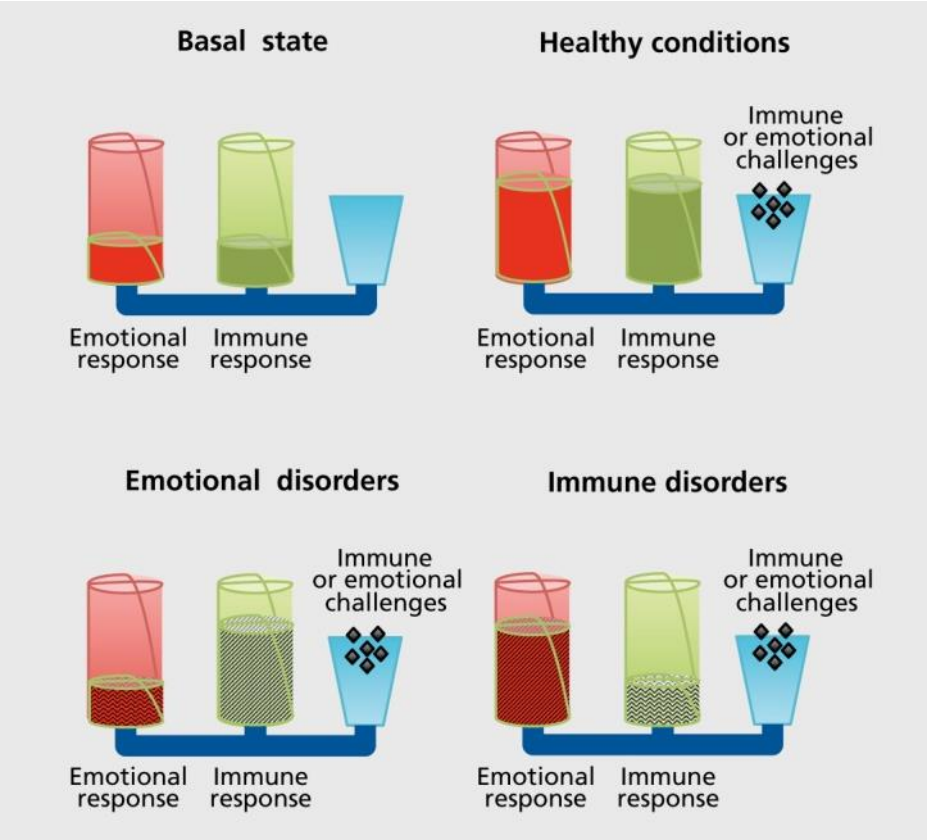
❖ Emotional health and Immunity during COVID-19

- ❖ **Given the context of current COVID-19 pandemic, what are the major stressors we are facing?**
- ❖ **Should we really panic? What does the evidence suggest regarding the seriousness of these COVID-related stressors?**
- ❖ **What are the adverse effects of stress on immunity?**
- ❖ **How to combat stress and anxiety? How to manage these negative emotions for better immunity?**



D'Acquisto F. Affective immunology: where emotions and the immune response converge. *Dialogues Clin Neurosci*. 2017

❖ Stressors

- **Stress can be caused by any event, experience, or environmental stimulus that disturbs or interferes with normal physiological equilibrium or homeostasis.**

- **Stressors can make individuals more prone to physical and psychological problems, including heart disease and anxiety.**

- **Stressors can be classified into four categories –**

1. Crises or Catastrophes
Eg:- Pandemics, floods, wars

2. Major life events
Eg:-Death of a loved one

3. Daily hassles/microstressors
Eg:- Exams, conflicts, decision making

4. Ambient stressors
Eg:- Pollution, noise, crowding, traffic

Pastorino, E. & Doyle-Portillo, S. (2009). What is Psychology?. 2nd Ed. Belmont, CA: Thompson Higher Education.

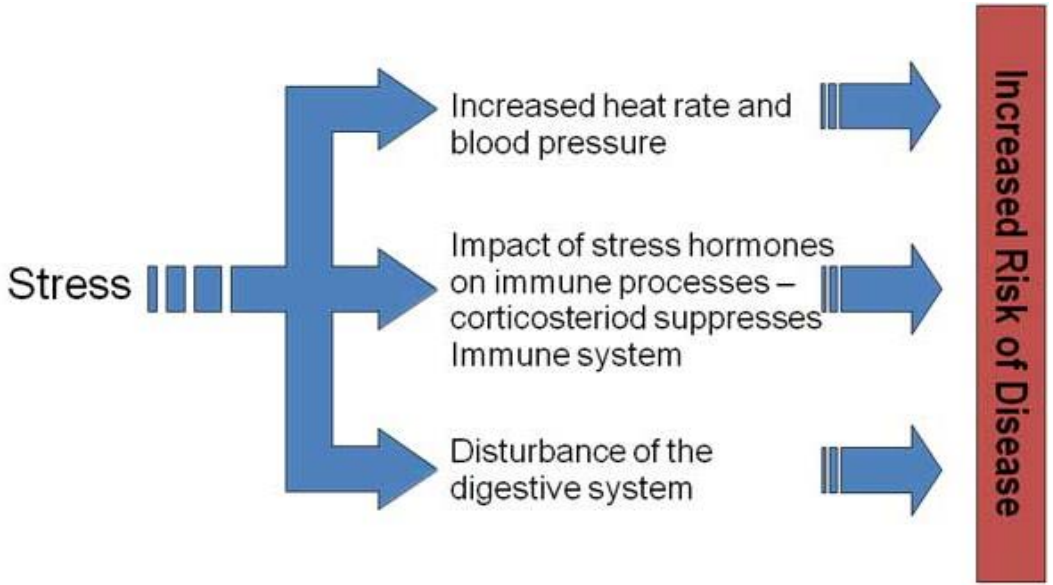
❖ Response to Stress

- **Due to stress, the immune system's ability to fight off antigens is reduced. This can make one more susceptible to infections.**

- **The stress hormone corticosteroid can suppress the effectiveness of the immune system. Eg:- Lower the number of lymphocytes.**

- **Stress responses can cause –**

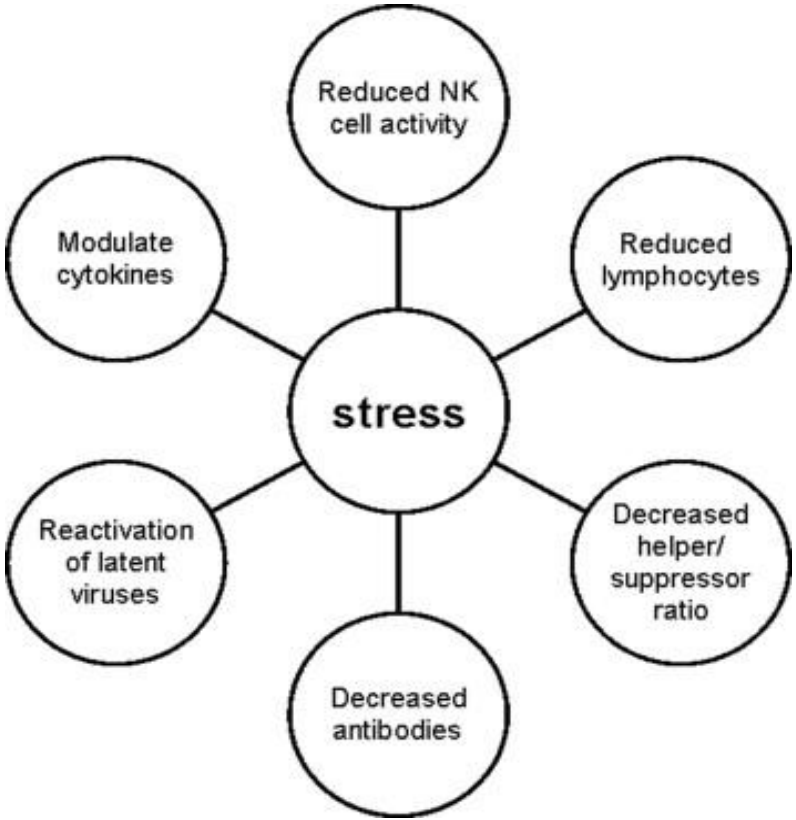
- **Inhibition of digestion**
- **Increased heart rate, blood pressure**
- **Increased blood cholesterol levels**
- **Prolonged stress decreases lymphocyte count in body**



McLeod, S. A. (2010). *Stress, illness and the immune system*. Simply Psychology

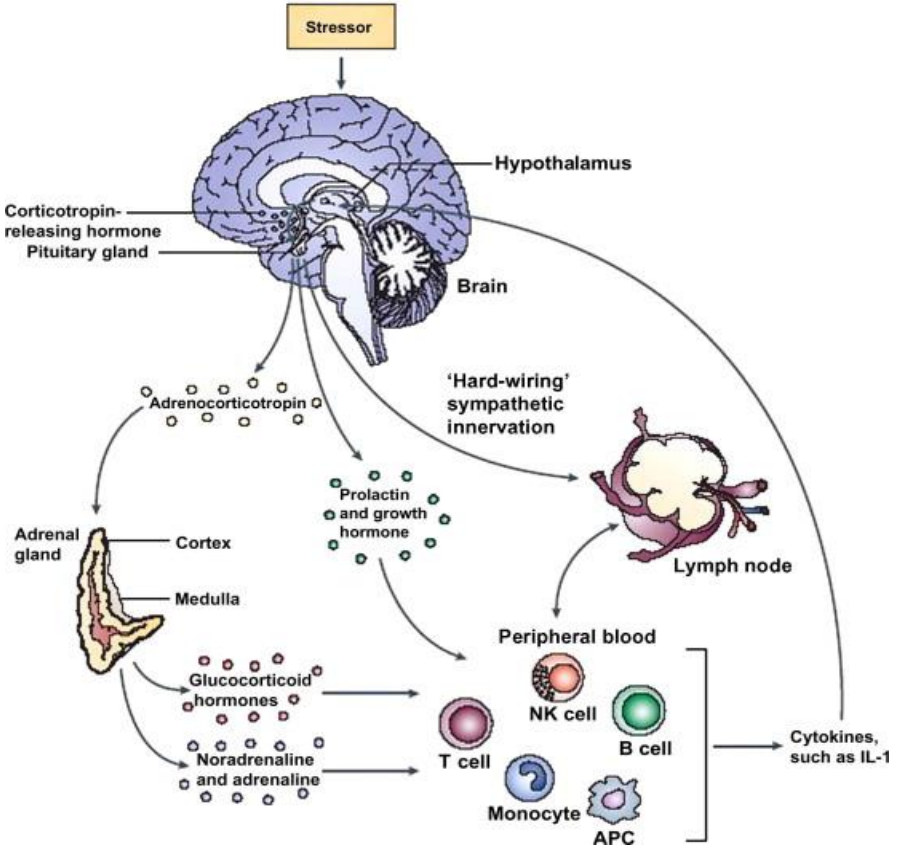
❖ Alter effects of Stress and Anxiety

- **Stress affects various aspects of the immune system. Stress can reduce NK cell activity, reduce the number of lymphocytes, decrease the ratio of helper to suppressor T cells, decrease antibody production, reactivate latent viruses and modulate cytokine production.**



J. Marketon, R. Glaser, “Stress hormones and immune function”, Cellular Immunology, 2008

❖ Stress associated immune modulation



- **Social isolation stress can lead to hyperactivity of the hypothalamic–pituitary–adrenal (HPA) axis through an increase in corticotropin production and release.**
- **The abnormal levels of glucocorticoid can modulate immune system (and have been related to depressive-like behavior)**

J. Marketon, R. Glaser, "Stress hormones and immune function", Cellular Immunology, 2008

❖ Stress and Immune response

- **Long-term/Chronic stress causes**

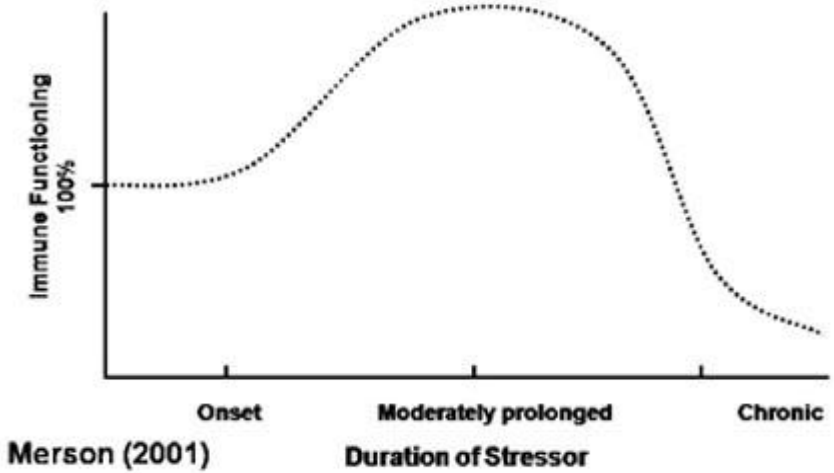
- **Both natural and specific immunity are negatively affected, including Th1 (e.g., T cell proliferative responses) and Th2 parameters.**

- **Decreased lymphocyte levels**

- **Weaker lymphocyte-T cell responses**

- **Chronic stress may affect IgG stability or the number of IgG producing cells following vaccination**

- **Less vigorous T cell response following vaccination**



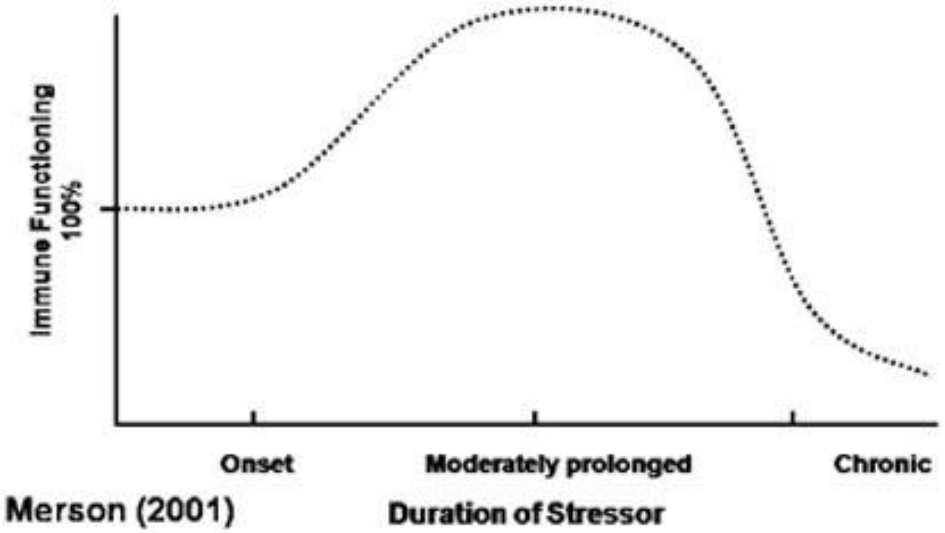
J. Marketon, R. Glaser, “Stress hormones and immune function”, Cellular Immunology, 2008

❖ Stress and Immune response

- **Short term suppression of the immune system is not dangerous. However, chronic suppression increases vulnerability to infection and disease.**

Short-term/Acute psychological stress can cause -

- **Increase in natural killer (NK) cells**
- **Downregulation of Toll-like receptor pathways**
- **Decrease in a Th1-type cytokine, IFNγ**
- **Increase in the Th2-type cytokines IL-6, which stimulates natural and humoral immune functions, and IL-10, which inhibits Th1 cytokine production.**
- **CRP levels don't change.**



D'Acquisto F. Affective immunology: where emotions and the immune response converge. *Dialogues Clin Neurosci*. 2017

❖ Other stressors during COVID-19

- **Stress can be caused by any event, experience, or environmental stimulus that disturbs or interferes with normal physiological equilibrium or homeostasis.**

Some examples of stress inducers for students during COVID-19 pandemic –

- **Social isolation**
- **Lack of in-person interaction with peers**
- **Limitations of online teaching and assessment**
- **Non-conducive environment at some homes**
- **Health concerns regarding friends and family**
- **Future uncertainty**

Effects of COVID-19 pandemic on immune status

- **Social isolation stress can lead to neuroinflammation, with higher levels of toll-like receptors, IL-6 and TNF-α in the hippocampus, increased plasma levels of TNF-α, IL-4, IL-10, and ACTH, as seen in isolated rats.**

- **Social isolation and loneliness may be linked to systemic inflammation (i.e., high levels of C-reactive protein and IL-6) in the general population. Isolation during quarantine, via changes in neuroendocrine-immune circuits, can trigger damage to mental health.**

- **Some studies demonstrate that a worse socioeconomic status is directly related to higher levels of inflammatory markers such as IL-6 and C-reactive protein. Thus, it is possible that neuroimmune interactions may also be involved in the impacts of financial stress during COVID-19 on mental health.**

Raony, Ícaro et al. “Psycho-Neuroendocrine-Immune Interactions in COVID-19: Potential Impacts on Mental Health.” *Frontiers in immunology* May. 2020

❖ Coping with stress, anxiety or distress

- **One of the most effective ways by which we can manage stress and anxiety is to focus on the actions that are in our control.**

Some suggestions for stress management during COVID-19 pandemic (by CDC) –

- **Physical exercise**
- **Mindfulness meditation exercises**
- **Maintain your day-to-day activities and a routine, as much as possible**
- **Stay connected with friends and family**

Prolonged stress and anxiety are detrimental for our immunity and health.

Looking after our well-being in times like this can help to reduce stress, and is crucial in enabling us to still take calm and effective action in the midst of this global crisis.

❖ Coping with stress, anxiety or distress

- **One of the most effective ways by which we can manage stress and anxiety is to focus on the actions that are in our control.**

Some suggestions for stress management during COVID-19 pandemic –

❖ **Physical exercise –**

•Physical activity may help flush bacteria out of the lungs and airways.

•Exercise causes antibodies or WBCs to circulate more rapidly, so they could detect illnesses earlier.

•Exercise training has an anti-inflammatory influence.

Moderate physical exercise daily is beneficial for people with comorbidities also.

❖ Coping with stress, anxiety or distress

- **One of the most effective ways by which we can manage stress and anxiety is to focus on the actions that are in our control.**

Some suggestions for stress management during COVID-19 pandemic (by CDC) –

❖ **Mindfulness meditation exercises can -**

•Cause improved immune function, reduced blood pressure and enhanced cognitive function.

•A boost in natural antibodies

•Reduced pro-inflammatory gene expression

•It is a powerful solution to combat the biggest stress hormone - Cortisol

❖ Coping with stress, anxiety or distress

- **One of the most effective ways by which we can manage stress and anxiety is to focus on the actions that are in our control.**

Some suggestions for stress management during COVID-19 pandemic (by CDC) –

- **Take deep breaths, stretch**
- **Try to eat healthy, well-balanced meals**
- **Make time to unwind - Try to do some activities you enjoy**
- **Limit media to reduce anxiety**

- **Helping Others Cope**

Taking care of yourself can better equip you to take care of others. During times of social distancing, it is especially important to stay connected with your friends and family. Helping others cope with stress through phone calls or video chats can help you and your loved ones feel less lonely or isolated.

THANK YOU