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MEDITATION - AN AUXILIARY TOOL TO BOOST IMMUNITY IN TIMES OF NOVEL CORONAVIRUS

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ABSTRACT

Living through a pandemic can be scary. Corona virus has been defined as the worldwide spread of a new disease by the World Health Organisation. This global pandemic has resulted in much worry, concern and fear. Many countries are in lockdown, schools have been shut down, elderly and physically vulnerable people are in danger, people are stuck inside and the economic impacts are devastating. All these factors are adding to the anxiety and distress. Psychological stress can damper the ability to remain resilient in the face of challenges. The research data can be used to provide evidence-driven strategies so that adverse psychological impacts could be reduced. In this paper, an effort has been made to suggest the complementary strategy for facing the current psychological crisis. The research studies that can establish a relationship between meditation as an intervention and mental and emotional health have been included. This paper reviews several scientific studies that demonstrate that meditation helps boost the immune system.

KEYWORDS: Corona virus, Mindfulness-based interventions, Immune function, Telomeres, Inflammatory cytokines.

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INTRODUCTION

The Coronavirus disease has affected as many as 213 countries and territories across the world. The number of confirmed cases has jumped to approximately 140 million (as on 17.04.2021) while near about three million people have died from the infectious disease.

WHO proclaimed it as a public health emergency of international concern on 30 January 2020 and later as a pandemic on 11 March 2020. After that, fear and anxiety prevailed among the general population. The large-scale disruptive events result in mental and emotional health issues, such as post-traumatic stress disorder, behavioural and psychological disorders, depression, stress, and anxiety etc (Makwana, 2019). During the current coronavirus pandemic, there is an urgent need for resilience at every societal level (Christiaan H. Vinkers, 2020). The news about the increasing numbers of coronavirus pandemic patients leaves an imprint of fear and anxiety in the minds of people. The mandatory measures of social distancing, quarantine and lockdowns are adding up to the prevailing stress. Inability to travel, interact and shop freely is creating boredom. Many employees are being laid off and promotions and increments are on hold. The uncertainties are rising. Some persons are in more danger than others, depending upon the living conditions, standard of living, nature of employment, ageing factors and immunity response of the body. Many people are suffering from stress related reactions, such as lack of concentration, irritability, anxiety, insomnia, and conflicts in relationships. Senior adults are at high risk due to their chronic underlying diseases and weak immune system (Meng et al., 2020). Thus, the senior adults need to be paid more attention toward their mental health due to the complex psychological environment. The Coronavirus Anxiety Scale (CAS) has also been created to identify patients that are affected by the fear and anxieties of COVID-19 crisis. Coronavirus anxiety has been termed as “corona phobia”.

For the affected people, the National Health Commission of China had issued guidelines to be implemented by trained mental health professionals. Online platforms have been opened by medical institutions to provide online counselling services for the general population, patients and their caretakers. The urgent need for addressing the mental health needs of health workers, patients and their quarantined family members has been emphasized (Xiang et al., 2020). Despite all resources and precautions used to combat the spreading of the virus, strategies are needed to handle the mental health issues globally (Torales et al., 2020). There are

potential gaps in psychological health services that have emerged during this crisis. The medical professionals working in hospitals should receive training for providing mental health care. COVID 19 patients suffer from depression even during discharge from the hospital. The medical responders and health care workers have been found in great stress and become emotionally affected and traumatised. Thus, the psychological effects of this virus are causing harm to the society of every field, everywhere globally and there is an urgent need to bring the people out of this stigma. There is a need to provide interventions pre- and post-disaster period to control the adverse mental health effects and minimize psychological impact of this disease.

Meditation stimulates immune system brain-function regions such as the right anterior insula, prefrontal cortex, and right hippocampus. These parts make the immune system function more effective if stimulated. Secondly, meditation has been proved to enhance resilience against difficult circumstances. Stress produces results in enhancement of size and reactivity of amygdala and depletion in size of hippocampal and frontal cortex. The resilience to stress is positively associated with meditation interventions and may prove to be a marker for brain plasticity.

This paper studies how meditation as an intervention can act as an immunity booster in this pandemic.

USEFULNESS OF MEDITATION IN IMMUNE FUNCTION FOR BATTLING CORONAVIRUS

In the battle against the novel Coronavirus, medical experts are working hard to find a cure for COVID-19. With no definitive cure in sight, a healthy immune function is a must to have (Jayawardena et al., 2020). Improvements in lifestyle such as incorporating physical exercise and healthy diet in routine and use of complementary medicines and therapies are being increasingly considered as an important factor to combat COVID-19. Complementary and alternative healthcare and medical practices are not considered to be part of conventional medicine (Tabish, 2008). The interconnection of meditation with the immunity system can be studied under the following heads:

IMMUNE CELLS

Natural killer cells protect from viral infections by killing stressed or abnormal cells. Relaxation and guided imagery showed an increase in natural killer cell function (R. Zachariae, 1990). The amount of these cells is related to the

different types of cancer, infections, and autoimmune disorders (Herberman, 1994). Also, B-lymphocytes initiate antibody production. These antibodies attack invading viruses, toxins, and bacteria (LeBien TW, 2008). As per the clinical reports, the number of lymphocytes decreased remarkably in ICU COVID-19 patients (Yonggang Zhou & Yingjie Qi, 2020). Some healthy individuals who practice TM meditation techniques were studied for the relation between these immune components and meditation (Kamei et al., 2001). This research resulted in reduced stress signalled with an increase in alpha wave and NK cell activity. Apart from this, another research shows the effect of regular practice of transcendental meditation on the number of NK cells and B lymphocytes (Infante JR, 2014). The results revealed that meditators had increased count of B-lymphocytes and Natural killer cells as compared to the control group. Thus, meditation could strengthen immune function, increasing the ability to combat infection and disease.

IMMUNE RESPONSE

The Thelper type 1 (Th1) cell response may be activated as a result of enhanced levels of inflammatory cytokines found in patients detected with coronavirus (Ye et al., 2020). An adaptive immune response is required to eradicate the virus and to hinder further succession of the disease (Shi et al., 2020). Thus, it is important to boost immune response at this stage. Meditation may modulate cellular immune response. In a study, the subject was able to affect not only her skin test response but also the response of her lymphocytes with the help of meditation (G. R. Smith, 1985). In another research study, a strenuous physical stress in subjects practising meditation resulted in modified cellular immune response (Solberg et al., 1995). A close relationship exists between the neuroendocrine and the immune system. Meditation may influence the release of immunologically active substances.

Antibodies are the molecules secreted by immune cells that help immune cells fight toxic substances. HIV infected individuals have severely impaired antibody response (F. P. Kroon, 2000). There exists a strong correlation between psychological stress and antibody responses to immunizations (S. Cohen, 2001).

A study was performed with healthy employees of an organization to explore the correlation between mindfulness meditation and brain and immune function (Davidson et al., 2003). This resulted in remarkable improvements in left-sided

anterior activation and growth in antibody titers to influenza vaccine in the mediation group compared with the non meditators group.

IMMUNE CELL COUNT

The immune cell count acts as a prognostic marker for many autoimmune disorders. COVID-19 patients have reduced T cell counts (Diao et al., 2020). HIV-1 infected patients have decreased CD4+ T lymphocyte counts that can be buffered by mindfulness meditation training (Creswell et al., 2009). In another study, researchers have shown that T-cytotoxic suppressor lymphocytes can be increased in HIV-infected men by meditation (Antoni et al., 2000). The cognitive-behavioural stress management intervention also resulted in changes in T-lymphocyte counts in HIV+ gay men. Those assigned to CBSM possessed more T-cytotoxic/suppressor lymphocytes 6 to 12 months later. Mindfulness-based cognitive therapy has also found to have an effect on CD4 cell count (Gonzalez-Garcia et al., 2014). The efficacy of Mindfulness-based Stress Reduction was studied among HIV+ patients in Iran. Significant improvements in mean Medical Symptom Checklist and Symptom Checklist-90-Revised were observed for the MBSR condition (Seyed Ahmad Seyed Alinaghi & Black, 2012).

INFLAMMATORY CYTOKINES

Cytokines are the immune cells that have the capability to modulate the immune response to infections and injuries. These are of two types: pro-inflammatory and anti-inflammatory cytokines. Pro-inflammatory cytokines may act as shield against injury or infection.

One of the most hazardous effects of COVID-19 is cytokine storm. The main factors in the production of the cytokine storm are interferons, interleukins, chemokines and TNF-alpha (Coperchini et al., 2020). The COVID-19 infected patients are found to have higher concentration of pro-inflammatory cytokines. The patients with higher concentration of CXCL10, CCL2, and TNF α required ICU admission (Huang et al., 2020). The diabetic patients diagnosed with COVID-19 had more C- Reactive Protein and IL-6 (Guo et al., 2020). The overwhelming pulmonary infections are mainly the result of the cytokine storm.

Mindfulness interventions have been shown to decrease pro inflammatory cytokines. A study has shown improvements in IL-6 by mindfulness meditation using a posterior cingulate cortex (PCC) (J. David Creswell et al., 2016). A randomized trial for evaluation of a brief meditation intervention to reduce

depression, stress, and inflammatory activity in younger breast cancer women showed that lower levels of IL-6 were found in mindful intervention group participants (Bower et al., 2015). For cancer patients and their caretakers, a mindfulness-based stress reduction program for cancer proves to be effective in stress, anxiety, and cortisol levels (Lengacher et al., 2012). Measures of salivary cortisol and IL-6 were much found to be decreased after the intervention. When efficacy of Mindfulness-Based Stress Reduction intervention was compared with Health Enhancement Program (HEP) in reducing experimentally-induced inflammation, it was found that the meditation was successful in achieving smaller post-stress inflammatory response as compared to the Health Enhancement Program (Rosenkranz et al., 2013). Lonely older adults are more vulnerable to pro-inflammatory genes. Another study in older adults resulted in down regulating loneliness-related pro-inflammatory gene expression with the help of MBSR program (Creswell et al., 2012). Many older adults complain about sleep problems leading to various health issues. Such people in Los Angeles community were randomized into two standardized treatment conditions, Mindful Awareness Practices and sleep hygiene education (Black et al., 2014). Findings proved that meditation reduced levels of pro-inflammatory transcription markers in older adults. Influenza is the most serious of the viral Acute respiratory infections (ARIs), but training in meditation can reduce susceptibility to ARI illness (Barrett et al., 2012; Bruce Barrett & Rebecca West, 2012). This study also included coronavirus among others. Compared with the control group, duration, incidence, and global severity of ARI illness were 43%, 33%, and 60% lower in the mindfulness group.

TELOMERES AND TELOMERASE ACTIVITY

Telomeres are positioned on the chromosomes of human DNA. When a telomere becomes too short, these caps protect from cellular deterioration and cellular division but deficiency of telomerase results in telomere length reduction. This causes aging and various age-related diseases. The short length of telomeres is associated with increased death rate (Wang et al., 2018). The persons suffering from COVID-19 are at higher risk of dying if telomere is short in their leukocytes (Aviv, 2020).

The telomerase activity in immune cells is also influenced positively by meditation. During a residential Insight meditation retreat, changes in telomere length, telomerase activity, and telomere-related gene expression were observed with the practice of intensive meditation practice (Conklin et al., 2018). An increase

in TL was found in the retreat group. In another study, an increase in telomere length was found in the Loving-Kindness Meditation practitioners than the control group (Hoge et al., 2013). Likewise, telomerase activity is also affected with the regular practice of meditation. At the end of a meditation retreat, the telomerase activity was found to be greater in retreat members as compared to the controls (Tonya L. Jacobs et al., 2011). Telomerase activity was also observed in dementia caregivers. Telomerase activity in their peripheral blood mononuclear cells was measured after practicing Kirtan Kriya (Lavretsky et al., 2013). This activity had improved 43% in the intervention group as compared to 3.7% in the relaxation group. The MBSR program was also implemented with breast cancer survivors (Lengacher et al., 2014). The telomerase activity was significantly improved in meditators in comparison to the control group.

Thus, meditation has been shown to be effective in delaying the progression of various diseases, enhancing immune function and treating psychological disorders. Meditation has resulted in stable CD8⁺ T-cell numbers, improvements in telomerase activity, NK cell count, and B-lymphocyte counts (Thibodeaux & J. Rossano, 2018). The beneficial effects of different meditation techniques adapted from the Raja Yoga system have been studied on immunity. Studies have revealed that meditation moderates the levels and functions of several immune cells and mediators (Raja Amarnath G, 2017). The variations of Raja Yoga meditation like Heartfulness meditation are simple, easy to practice and foster better adherence to derive maximum benefits.

CONCLUSION

In the current COVID-19 crisis, the governments are focussing upon social distancing, hygiene, use of masks, quarantine etc. But the mental health issues and psychological needs have been neglected. The meditation interventions can help the victims adapt to the changes and develop resilience so as to normalize their mental health. The research in the areas of clinical application of meditation interventions has increased substantially in the last decade. Though meditation has a longstanding history, it is only since the late 20th century these techniques have been incorporated clinically. The research has shown that meditation training has benefited many individuals and patients suffering from diverse medical conditions. The evidence of positive effects of meditation on psychological health has also been provided. The cognitive parameters have also shown to be improved. In such an era of social distancing, digital technologies can be employed to provide

accessible online and mobile mental health. A digital mental health revolution is needed to provide mental health services to the needy during social distancing measures. This revolution can include mobile interventions such as apps, text messaging and tele services. Tele psychiatry assumes special significance in current situations with restrictions on travel and public gathering. The meditation practitioners should come forward to provide online meditation services at a global level.

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