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Review Article

COVID-19 and neuropsychiatric disorders: Common links and extended networks

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Abstract

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), a single-stranded RNA virus has been plaguing the world through spreading coronavirus disease 2019 (COVID-19). In addition to physiological complications, COVID-19 led neurological and psychological problems that have been documented since the outbreak of COVID-19 in December, 2019 in Wuhan, China. The present article demonstrates the neuropsychiatric complications associated with COVID-19. The current review would be of immense importance to those linked with COVID-19 mitigation, caregiving, health professionals, researchers, academicians as well as the COVID-19 sufferers.

Introduction

Coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has posed a grave threat to humanity since December, 2019. Firstly observed in Wuhan, China, COVID-19 has turned into a global threat. According to World Health Organization (WHO), "globally, as of 3:34pm CEST, 7 April 2021, there have been 132,046,206 confirmed cases of COVID-19, including 2,867,242 deaths. The number of new deaths also increased by 11% compared to last week, with over 71 000 new deaths reported. As of 5 April 2021, a total of 604,032,357 vaccine doses has been administered" [1]. However, the vaccine against SARS-CoV-2 is in its greenhorn to serve the world and we have to wait for any other alternative capable of withstanding the progression of COVID-19 pathogenesis [2]. In addition to multiple physiological anomalies, the mental health of the COVID-19 sufferers also faces deplorable condition [3]. In other words, neuro-psychiatric abnormality coincides with the physiological abnormalities of the COVID-19 patients [4]. Though treatment strategies had been targeted towards amelioration of physiological states of the COVID-19 patients, psychological support, research and development and guidelines as well as associated regulations had received little attention. Thus, the present articles had been aimed at delving out the neuro-psychiatric disturbances of the COVID-19 patients followed by their tentative remedies. Care had been taken to grasp information from the most recently available data. At the same time, constructive criticism of the already utilized practice and necessary suggestions has been put forward.

COVID-19 and neuropsychiatric disorders: common links and extended pathophysiological networks

Virus mediated respiratory tract infection leads towards multi-organ and multi-system complications including the Central Nervous System (CNS) [5]. SARS-CoV-2 utilizes the olfactory nerve and bulb to enter the CNS where they replicate in the neurons and cause inflammation and demyelination. The virus spreads throughout the brain and Cerebrospinal Fluid (CSF) within a week [5]. Olfactory and gustatory problems (ageusia, anosmia and hyposmia) have been observed in about 50% of the COVID-19 patients [7]. Besides, the SARS-CoV-2 uses the angiotensin-converting enzyme 2 (ACE2) receptor of the oro-nasal mucosa to enter the CNS and initiate a cytokine storm that culminates into neuroinflammation and immune-mediated inflammation that becomes manifested as convulsions and delirium [8]. Thus, CNS modulating effects of

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SARS-CoV-2 involving neuropsychiatric abnormalities remains a grave concern of COVID-19 [9,10].

Those already suffering from neurological and psychological complications become much vulnerable towards SARS-CoV-2 infection and the heightened risk warrants extensive caregiving and appropriate medico-therapy [11]. Alarmingly, the aged populace and those suffering from neurodegenerative diseases like Alzheimer's disease (AD) pose extra threat upon the already existing neuro-psychiatric disorders [11].

Neuropsychiatric symptoms associated with COVID-19 can be clustered into three groups [12]

A. Olfactory symptoms: anosmia and hypogeusia.

B. General constitutional-like neuropsychiatric symptoms: dizziness, headache and limb force reduction.

C. Specific neuropsychiatric symptoms: photophobia, mental state change, hallucination, vision and speech problem, seizure, stroke and balance disturbance.

Acute neuropsychiatric problems associated with COVID-19

Delirium: Delirium is the most notable acute neuropsychiatric disorder among the aged COVID-19 patients especially those suffering from dementia [13]. Delirium has been observed in about 15% of the COVID-19 sufferers [6]. Behavioral alteration and poor cognitive performance associate with delirium in the COVID-19 sufferers [14].

Anxiety: Anxiety and mood disorder run parallel with COVID-19. Symptomatic studies link anxiety as acute complication of COVID-19 [15,16].

Besides, depression, fatigue, headache and post-traumatic stress disorder (PTSD) are among the acute and chronic consequences of COVID-19 led neuropsychiatric disorders [15-17].

Mitigation strategies

1. To restrict the entry of SARS-CoV-2 through nasal route, to ensure the usage of the mask.
2. To reduce the attachment with the virus, wearing hand gloves and protect the whole body with appropriate clothes/materials.
3. To wash hands repeatedly with sanitizer.
4. To maintain social distance.
5. Provide psychological supports to the COVID-positive and their care givers.
6. Implementation of quarantine/isolation for the affected people.
7. Extension of immunization program for all.
8. Seeking help from the Almighty Creator and remain to engage in religious activities so that psychological status boosts up.

Conclusion

As COVID-19 has been paralyzing the global healthcare, psychological, economical, educational, societal and political situation harshly, immediate measures against this pandemic are inevitable. However, human endeavor since the present time, seems meager with respect to the global crisis. Thus, following the mitigations strategies and providing psycho-social support to the already affected COVID-19 patients seem apt. At the same time, the search for effective vaccine and medico-therapy against SARS-CoV-2 remains promising.

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