



WHAT ARE THE NEUROPSYCHIATRY RAMIFICATIONS, IN THE WAKE OF COVID-19?

Medical Science

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ABSTRACT

SARS CoV 2 heralded onset of many challenges globally. We are facing numerous medical issues on daily basis. SARS CoV 2 is relatively still a novel virus. Much of the research and efforts has been spent in combating immediate, apparent and life-threatening effects of the virus, yet few studies have pointed out that the effect of covid 19 is not just limited to respiratory system. Hence in this article we will review the neuropsychiatric consequences of SARS CoV 2. COVID 19 apart from psychological consequences may have some biological contribution as well for mental ailment. In this article we shall try to summarize the same.

KEYWORDS

Covid 19, mental health, neuropsychiatry

INTRODUCTION

Covid 19 without any doubts has been a huge burden globally. The damage and adverse events are still unfolding. What makes the situation graver is the fact that COVID 19 keeps resurfacing in waves leaving health care workers and rest of the population uncertain, apprehensive and fearful about the future. The amount of damage that has been caused is unparalleled in terms of loss of wages, loss of business, loss of close family members, economical loss, financial losses, is unaccountable. With such a huge extent of loss, mental stress, tension, anxiety, fear is bound to happen. One of the ways human kinds find solace during tough times is by comfort of near and dear ones. With covid 19 requirements of social distancing the matter became grimmer. This caused increased anxiety due to isolation, inability to visit loved ones.

Psychiatry illness are a definite consequence of COVID- 19 disease. The isolation, hospitalization, intense stigma, fear, mounting medical bills and of course SARS CoV-2 infection itself as well, all of these acts as precursor for mental ailments.

Previous history of Covid viruses and neuropsychiatry manifestations: Previous pandemics of influenza which had appeared in 18th and 19th century had been marked by number of raised cases of neuropsychiatric manifestations such as depression, mania, delirium, insomnia, raised rates of suicide.¹

As SARS-CoV-2 is still a very novel condition its long-term deleterious effect is yet to be known on the various systems. Many studies are reporting about neuropsychiatric manifestations of the SARS-CoV-2, the manifestations are both of acute and of long term in nature.

Acute neuropsychiatry manifestations

Cytokine storm syndrome is a surge in immune responses eventually might lead the immune system to exhaustion, and result in organ failure and fatal respiratory distress. Infection with severe acute respiratory syndrome-coronavirus-2 can result in uncontrolled production of cytokines and eventually the development of cytokine storm syndrome² due to which patient can suffer from encephalopathies and delirium. What is concerning is that these conditions may have long lasting effects on cognitions according to few studies especially in elderly patients.³

Chronic neuropsychiatry manifestations

Previous studies have demonstrated that long term neuropsychiatry manifestations post influenza outbreaks were significant. In one study survivors of SARS were clinically suffering from depressive disorder (39%), panic disorder (33%), post-traumatic stress disorder (54.5%) and obsessive-compulsive disorder in 16%, and a substantial increase of 3% of any psychiatric comorbidity compared to their pre-infection prevalence when evaluated thirty to fifty months after the infection.⁴ Yet other studies have showed that if the fetus is exposed to the virus within the womb, or if the child is exposed the virus during

developmental years, there are increased likelihood of child developing schizophrenia.^{5,6}

Recent retrospective cohort study was conducted on 2,36,379 Co-V 2 survivors by National Institute for Health Research (NIHR) Oxford Health Biomedical Research Centre shows that around 17.39% (17.04–17.74) suffer from anxiety disorder, and 1.40% (1.30–1.51) from psychotic disorder. Approximately as many as 33% of these survivors had incidence of a neurological or psychiatric illness, of which 12.8% of the patients were diagnosed for first time of such diagnosis.⁷

Apart from neuropsychiatry manifestations as psychiatrists what should concern us immensely is the emotional response to covid 19. This could lead to an increased and exaggerated stress response which could manifest as

- Stress or disorder related to trauma (adjustment disorder, post-traumatic stress disorder,)
- Or there could be aggravation of an existing mental illness or first episode may be triggered in those who are genetically vulnerable (stress-diathesis model)
- Or newer manifestation that does not meet previous criteria of formal psychiatry disorder.⁸

Pathophysiology

Central and peripheral nervous system are affected both structurally and functionally by many viral infections. Viral infections can lead to likes of encephalitis, toxic encephalopathy, demyelinating lesions. They can also cause immune reaction and invasion from macrophages, microglia, astrocytes in nervous system. Similarly, even covid virus has been found to cause damage to the nervous system by various ways i.e., direct viral load, secondly by hypoxic injury, immune reaction and few other mechanisms.⁹

Many studies have reported that SARS-CoV-2, affects nervous system especially those areas which are involved with respiration i.e., medullary structures like nucleus ambiguus, solitary tract nucleus).¹⁰

It is seen that in central nervous system the monocytes which are infected by virus release inflammatory cytokines, activate microglial cells, cause inflammation of nervous system and neuropsychiatry symptoms.¹¹ As these viruses persist in white cells for long period of time continuing to infect them,¹² they could serve as a potential source of neuroinflammation could be significantly longer than the initial infection and acute symptom presentation leading to chronic neuropsychiatry manifestation.

What needs to be done:

As reflected above the significant number of populations are suffering and will continue to suffer from psychiatry comorbidities as aftermath of SARS CoV-2. Even now the long-term effects of SARS CoV-2 will still take time to completely unfold. Hence it is of utmost importance to be vigilant and actively commit research in this area. It is also

important to diagnose patients who already are suffering from neuropsychiatry consequences of the SARS CoV-2, or due to stress related sequelae of covid 19.

After diagnosing the patients who are suffering from mental illnesses it is important to come up with suitable management strategy suiting the needs of the particular patient. Currently various treatment strategies can be employed like pharmacotherapy, psychotherapy, behavioral therapy, cognitive therapy or coaching about coping mechanism. To determine which treatment modality is best suited for the patient it is important evaluate patient thoroughly.

It is also important to come up with screening tools, to be administered on patients regularly to determine active neuropsychiatry cases. It is also important to determine the consequences of COVID-19 on weaker sections of the society like children, adolescents who might find it difficult to obtain timely mental health interventions.

Also, in the era of social distancing, work from home and online transactions it is important for us to employ newer efficient way of treating our patients. Telehealth is gaining popularity, and for all right reasons, if practiced with proper guidelines it can be very useful. Group therapy can also be a very useful tool, to overcome the shortage of mental health professionals. Other online modules for therapies such as cognitive therapy, behavior therapy, mindfulness and meditation which can be done are under the guidance of medical professional in comfort of their home will also be helpful.⁸

CONCLUSION

It should be acknowledged that this SARS CoV-2 pandemic might by all means be followed by a pandemic of mental and behavioral illnesses and it will be of utmost importance for us to be prepared for any such event. It is important for us to remember mental health is to be given as much gravity as any other aspect of health to ensure quality along with longevity of life, on the other side of this pandemic.

REFERENCES

- Honigsbaum, M., 2013. The art of medicine: "an inexpressible dread": Psychoses of influenza fin-de-siècle. *Lancet* 381, 988–989. [https://doi.org/10.1016/S0140-6736\(13\)60701-1](https://doi.org/10.1016/S0140-6736(13)60701-1)
- Hafezi B, Chan L, Knapp JP, Karimi N, Alizadeh K, Mehrani Y, Bridle BW, Karimi K. Cytokine Storm Syndrome in SARS-CoV-2 Infections: A Functional Role of Mast Cells. *Cells*. 2021 Jul 12;10(7):1761. doi: 10.3390/cells10071761. PMID: 34359931; PMCID: PMC8308097.
- Chung, H.-Y., Wickel, J., Brunkhorst, F.M., Geis, C., 2020. Sepsis-associated encephalopathy: from delirium to dementia? *J. Clin. Med.* 9, 703
- Lam, M.H.-B., 2009. Mental morbidities and chronic fatigue in severe acute respiratory syndrome survivors. *Arch. Intern. Med.* 169, 2142. <https://doi.org/10.1001/Archinternmed.2009.384>.
- Brown, A.S., Derkits, E.J., 2010. Prenatal infection and schizophrenia: a review of epidemiologic and translational studies. *Am. J. Psychiatry* 167, 261–280. <https://doi.org/10.1176/appi.ajp.2009.09030361>
- Khandaker, G.M., Zimbron, J., Dalman, C., Lewis, G., Jones, P.B., 2012. Childhood infection and adult schizophrenia: a meta-analysis of population-based studies. *Schizophr. Res.* 139, 161–168. <https://doi.org/10.1016/j.schres.2012.05.023>.
- Taquet M, Geddes JR, Husain M, Luciano S, Harrison PJ. 6-month neurological and psychiatric outcomes in 236 379 survivors of COVID-19: a retrospective cohort study using electronic health records. *Lancet Psychiatry*. 2021 May;8(5):416-427. doi: 10.1016/S2215-0366(21)00084-5. Epub 2021 Apr 6. PMID: 33836148; PMCID: PMC8023694.
- Esterwood E, Saeed SA. Past Epidemics, Natural Disasters, COVID19, and Mental Health: Learning from History as we Deal with the Present and Prepare for the Future. *Psychiatr Q*. 2020 Dec;91(4):1121-1133. doi:10.1007/s1126-020-09808-4. PMID: 32803472; PMCID: PMC7429118.
- Wu Y, Xu X, Chen Z, et al. Nervous system involvement after infection with COVID-19 and other coronaviruses. *Brain Behav Immun*. 2020;87:18-22. doi: 10.1016/j.bbi.2020.03.031
- Li, Y., Fu, L., Gonzales, D.M., Lavi, E., 2004. Coronavirus neurovirulence correlates with the ability of the virus to induce proinflammatory cytokine signals from astrocytes and microglia. *J. Virol.* 78 (7), 3398–3406
- Wohleb, E.S., McKim, D.B., Sheridan, J.F., Godbout, J.P., 2015. Monocyte trafficking to the brain with stress and inflammation: a novel axis of immune-to-brain communication that influences mood and behavior. *Front. Neurosci.* 9, 1–17. <https://doi.org/10.1016/j.schres.2012.05.023>.doi:10.3389/fnins.2014.00447.
- Arbour, N., Day, R., Newcombe, J., Talbot, P.J., 2000. Neuroinvasion by human respiratory coronaviruses. *J. Virol.* 74, 8913–8921. <https://doi.org/10.1128/jvi.74.19.8913-8921.2000>.