POST COVID DEPRESSION: A REVIEW OF LITERATURE

Mashal Jamil[1], Mashal Zaman[1], Anam Amin[1]*, Haroon Khan[1]**, Haleema Sadia[1]***, Jazza Jamil[1]**

[1]Rehman Medical College Peshawar, *[1]Northwest General Hospital, **[1]Northwest School of Medicine, ***[1]Khyber Teaching Hospital.

Abstract:
The most common symptoms of coronavirus disease are fever, cough, shortness of breath, muscle pain, headache, diarrhea, rhinorrhea, loss of smell and taste. In addition, there are more and more reports of mental health problems in people who have survived SARS-CoV-2 infection. The most frequently described mental disorders are major depressive disorder (MDD), post-traumatic stress disorder (PTSD), anxiety disorders, obsessive-compulsive disorders (OCD) and insomnia. MDD is hypothesized to be an active inflammatory process with elevated pro- and anti-inflammatory cytokines and oxidative stress. Depression is a leading cause of disability globally. Accordingly, depressive symptoms and clinically-significant depression in post-COVID-19 syndrome may have severe implications as it relates to quality-of-life outcomes. There is also a lack of comprehensive studies directly linking MDD and its biomarkers to COVID-19. Furthermore, it remains to be determined whether the high frequency of depression among individuals with post-COVID-19 syndrome is a long-term consequence of the viral infection or a result of the social and/or economic outcomes of the pandemic.

Keywords: *Corona virus; Depression; Post Covid; Major Depressive Episode.*

Corresponding author:
Mashal Jamil,
Rehman Medical College Peshawar,

QR code

INTRODUCTION:

The coronavirus disease (COVID-19) caused by the SARS-CoV-2 virus has been spreading worldwide for the last 2 years. [1] The most common symptoms of coronavirus disease are fever, cough, shortness of breath, muscle pain, headache, diarrhea, rhinorrhea, loss of smell and taste [2–4]. In addition, there are more and more reports of mental health problems in people who have survived SARS-CoV-2 infection. The most frequently described mental disorders are major depressive disorder (MDD), post-traumatic stress disorder (PTSD), anxiety disorders, obsessive-compulsive disorders (OCD) and insomnia [5–7]. These disorders occur mainly in the acute phase of infection and shortly after it [7–9]. While the symptoms of PTSD, anxiety disorders and insomnia gradually disappear, it has been shown that symptoms of MDD persist even in the third month of follow up [7].

REVIEW:

Depression, also called major depressive disorder (MDD) is the most common psychiatric disease in the world and one of the most common causes of disability measured in years lived with the disease (YLDs) [10]. According to WHO, over 264 million people currently struggle with MDD worldwide [11]. So far, the diagnosis of MDD is based mainly on clinical symptoms and scales [12-13], although for several years the field of psychiatry has been searching for useful biomarkers of MDD, which could allow to detect the disease, implement treatment faster and monitor its efficiency in a more objective way. [14-15]

Pathophysiology of MDD:

In recent years, the cause of MDD has been increasingly researched, and one of the leading hypotheses is an active inflammatory process with elevated pro- and anti-inflammatory cytokines and oxidative stress. [16] Increased levels of inflammatory factors are associated with excessive activation of the kynurenine pathway and, as a result, reduced levels of tryptophan and serotonin, as well as an excess of neurotoxic metabolites such as kynurenine, quinolinic acid or 3-hydroxykynurenine. Inflammatory factors and chronic stress are also reflected in the activity of the HPA axis and cause its hyperactivity. [16] All these accumulating changes cause neurotoxicity, neurodegeneration, inhibition of neurogenesis, disorders of synaptic plasticity and the structure of synaptic membranes, which all together result in the occurrence of MDD. [17]

High rates of neuropsychiatric symptoms (e.g., fatigue, depression) have been reported among individuals affected by COVID-19, suggesting an effect of COVID-19 on the central nervous system (CNS) (e.g., neurotropism of SARS-CoV-2, hyperinflammatory state and hypercoagulability following infection, especially in severe cases). [18-19] Depression is a leading cause of disability globally. [20] Accordingly, depressive symptoms and clinically-significant depression in post-COVID-19 syndrome may have severe implications as it relates to quality-of-life outcomes. [21]

CONCLUSION:

To conclude that in order to assess the risk of developing and diagnosing it, a more holistic post-COVID depression biosignature study should be performed. Unfortunately, there is still little research on this subject and it is often inconclusive. There is also a lack of comprehensive studies directly linking MDD and its biomarkers to COVID-19. Furthermore, it remains to be determined whether the high frequency of depression among individuals with post-COVID-19 syndrome is a long-term consequence of the viral infection or a result of the social and/or economic outcomes of the pandemic. Indeed, the COVID-19 pandemic has proven detrimental to measures of mental health within the general population. In future, in order to assess the true usefulness and relationship of the post-COVID depression biomarkers described in this study, there is a need for a prospective study linking their baseline level with the subsequent development of MDD.

REFERENCES:

1. WHO Coronavirus Disease (COVID-19) Dashboard. Dashboard with Vaccination Data. Available online: https://covid19.who.int/
2. Grant M.C., Geoghegan L., Arbyn M., Mohammed Z., McGuinness L., Clarke E.L., Wade R.G. The prevalence of symptoms in 24,410 adults infected by the novel coronavirus (SARS-CoV-2; COVID-19): A systematic review and meta-analysis of 148 studies from 9 countries. PLoS ONE. 2020;15:e0234765.
3. Vaira L.A., Salzano G., Deiana G., De Riu G. Anosmia and Ageusia: Common Findings in COVID-19
   Patients. Laryngoscope. 2020;130:1787.
   doi: 10.1002/lary.28692
4. Lai C.-C., Shih T.-P., Ko W.-C., Tang H.-J., Hsueh P.-R. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. Int. J. Antimicrob. Agents. 2020;55:105924.

5. Steardo L., Steardo L., Verkhratsky A. Psychiatric face of COVID-19. *Transl. Psychiatry.* 2020;10:261. doi: 10.1038/s41398-020-00949-5.

6. Kong X., Zheng K., Tang M., Kong F., Zhou J., Diao L., Wu S., Jiao P., Su T., Dong Y. Prevalence and Factors Associated with Depression and Anxiety of Hospitalized Patients with COVID-19. *medRxiv.* 2020

7. Mazza M.G., De Lorenzo R., Conte C., Poletti S., Vai B., Bollettini I., Melloni E.M.T., Furlan R., Ciceri F., Rovere-Querini P., et al. Anxiety and depression in COVID-19 survivors: Role of inflammatory and clinical predictors. *Brain Behav. Immun.* 2020;89:594–600.

8. De Lorenzo R., Conte C., Lanzani C., Benedetti F., Roveri L., Mazza M.G., Brioni E., Giacalone G., Canti V., Sofia V., et al. Residual clinical damage after COVID-19: A retrospective and prospective observational cohort study. *PLoS ONE.* 2020;15:e0239570.

9. Bo H.-X., Li W., Yang Y., Wang Y., Zhang Q., Cheung T., Wu X., Xiang Y.-T. Posttraumatic stress symptoms and attitude toward crisis mental health services among clinically stable patients with COVID-19 in China. *Psychol. Med.* 2020;51:1052–1053.

10. James S.L., Abate D., Abate K.H., Abay S.M., Abbafati C., Abbasi N., Abbastabar H., Abd-Allah F., Abdela J., Abdelalim A., et al. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: A systematic analysis for the Global Burden of Disease Study 2017. *Lancet.* 2018;392:1789–1858.

11. Depression. [(accessed on 31 August 2021)]. Available online: https://www.who.int/health-topics/depression#tab=tab_1

12. Nabbe P., Le Reste J., Guillou-Landreat M., Perez M.M., Argyriadou S., Clavería A., Fernandez-San-Martin M.I., Czachowski S., Lingner H., Lygidakis C., et al. Which DSM validated tools for diagnosing depression are usable in primary care research? A systematic literature review. *Eur. Psychiatry.* 2017;39:99–105.

13. Ng C.W.M., How C.H., Ng Y.P. Major depression in primary care: Making the diagnosis. *Singap. Med. J.* 2016;57:591–597. doi: 10.11622/smedj.2016174.

14. Gadad B., Jha M., Czysz A., Furman J.L., Mayes T.L., Emslie M.P., Trivedi M.H. Peripheral biomarkers of major depression and antidepressant treatment response: Current knowledge and future outlooks. *J. Affect. Disord.* 2017;233:3–14. doi: 10.1016/j.jad.2017.07.001.

15. Smith K.M., Renshaw P.F., Bilello J. The diagnosis of depression: Current and emerging methods. *Compr. Psychiatry.* 2012;54:1–6.

16. Gałecki P., Talarowska M. Inflammatory theory of depression. *Psychiatr. Polska.* 2018;52:437–447.

17. Lorkiewicz P, Waszkiewicz N. Biomarkers of Post-COVID Depression. J Clin Med. 2021 Sep 14;10(18):4142. doi: 10.3390/jcm10184142. PMID: 34575258; PMCID: PMC8470902.

18. Troyer E.A., Kohn J.N., Hong S. Are we facing a crashing wave of neuropsychiatric sequelae of COVID-19? Neuropsychiatric symptoms and potential immunologic mechanisms. *Brain Behav. Immun.* 2020;87:34–39.

19. Zubair A.S., McAlpine L.S., Gardin T., Farhadian S., Kuruvilla D.E., Spudich S. Neuropathogenesis and neurologic manifestations of the coronaviruses in the age of coronavirus disease 2019: a review. *JAMA Neurol.* 2020;77:1018–1027.

20. GBD 2016 Disease and Injury Incidence and Prevalence Collaborators Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet.* 2017;390:1211–1259

21. Renaud-Charest O, Lui LMW, Eskander S, Ceban F, Ho R, Di Vincenzo JD, Rosenblat JD, Lee Y, Subramaniapillai M, McIntyre RS. Onset and frequency of depression in post-COVID-19 syndrome: A systematic review. J Psychiatr Res. 2021 Dec;144:129-137.