Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Brain, Behavior, and Immunity 87 (2020) 4–5

Contents lists available at ScienceDirect

Brain, Behavior, and Immunity

journal homepage: www.elsevier.com/locate/ybrbi

Viewpoint

Using psychoneuroimmunity against COVID-19

Sung-Wan Kim[a], Kuan-Pin Su[b,c,d,*]

[a] Department of Psychiatry, Chonnam National University Medical School; Mindlink, Gwangju Bukgu Community Mental Health Center, Gwangju, Republic of Korea
[b] Department of Psychiatry & Mind-Body Interface Laboratory (MBI-Lab), China Medical University Hospital, Taichung, Taiwan
[c] College of Medicine, China Medical University, Taichung, Taiwan
[d] An-Nan Hospital, China Medical University, Tainan, Taiwan

ABSTRACT

The worldwide outbreak of coronavirus disease 2019 (COVID-19) raises concerns of widespread panic and anxiety in individuals subjected to the real or perceived threat of the virus. Compared to general populations, patients who are institutionalized in a closed unit are also very vulnerable to COVID-19 infection and complications. This crisis touched on difficult issues of not only psychiatric care and ethics, but also psychological impacts to psychiatric care givers. In this Viewpoint, we address both physical and biopsychosocial aspects of this infection, as well as the psychoneuroimmunity of preventive strategies of healthy lifestyle, regular exercise, balanced nutrition, quality sleep and a strong connection with people. Social distancing and wearing masks might help us from pathogen exposure, yet such these measures also prevent us from expressing compassion and friendliness. Therefore, all forms of psychological support should be routinely implemented not only to consider psychological resilience but also to enhance psychoneuroimmunity against COVID-19.

The World Health Organization has declared that the outbreak of coronavirus disease 2019 (COVID-19) is a worldwide pandemic, raising concerns of widespread panic and increasing anxiety in individuals subjected to the real or perceived threat of the virus. Our life style and pattern are changing drastically and the effect of the COVID-19 pandemic is infiltrating every aspect of daily routines. Unlike infections such as the flu and other agents, media coverage has highlighted COVID-19 as a unique threat, which further exaggerates the panic, stress, and the potential for hysteria.

Compared to general populations, COVID-19 is more serious and fatal for elderly people and those with underlying physical illnesses and serious mental illnesses. Patients who are institutionalized in a closed unit are also very vulnerable population. In China, National Health Center announced at 17 Feb 2020 that more than 300 patients with serious mental illness were infected with COVID-19 (http://www.nhc.gov.cn, 2020). In Korea, the first COVID-19 outbreak occurred at a local psychiatric ward. Out of 103 patients held in the psychiatric ward, 102 were tested positive of the deadly virus. Seven, all in their 50 s and 60 s, died within one week. The mortality rate was about 7%, much higher than that of 1% in the general Korean population (http://ncov.mohw.go.kr, 2020). This crisis touched on difficult issues of not only medical care and ethics, but also psychological impacts to psychiatric care givers.

Firstly, community-dwelling people with schizophrenia exhibit poor physical health literacy and unhealthy lifestyles (Kim et al., 2019). Patients with severe mental illness may neglect prevention of infection due to cognitive decline. The reduced regular activity and exercise due to a fear of infection as well as negative symptoms further compromise patients' physical health and immunity. More worse, the psychiatric inpatient unit is a perfect breeding ground for the virus. Therefore, patients with serious mental illnesses are very vulnerable, both environmentally and physically, to infectious diseases.

Secondly, patients free from COVID-19 infection are also psychologically impacted by the COVID-19 pandemic. The dramatic increases of public fears and decreases in social and economic activities may trigger psychosocial sequelae. Those who are quarantined may evidence depression, fear, guilt, and anger (Brooks et al., 2020). Finally, mental healthcare professionals are also at risk of mental health problems. During the time of pandemic viral infection, mental health providers could run out of energy and attention by concentrating on the treatment and prevention of COVID-19, rendering their patients more vulnerable. Such professionals aiding epidemically infected patients are at high risk of post-traumatic stress disorder (Lee et al., 2018). During pandemic upheavals, many people may require psychiatric care. For example, in Korea, about 9000 persons were infected by COVID-19 to late March 2020 (http://ncov.mohw.go.kr, 2020). Patients with mild COVID-19 symptoms are isolated in special general hospitals or quarantine facilities. The Korean Psychiatry Society is offering regular free counseling for them through telephone sponsored by Korean government. Crisis intervention is being conducted for patients with acute stress reactions and suicidality along with excessive guilty and depression. Moreover, mental health care services to the general

* Corresponding author at: Department of Psychiatry, China Medical University Hospital, No. 2, Yuh-Der Road, Taichung 404, Taiwan.
E-mail address: cobolsu@gmail.com (K.-P. Su).

https://doi.org/10.1016/j.bbi.2020.03.025
Received 23 March 2020; Received in revised form 25 March 2020; Accepted 25 March 2020
Available online 29 March 2020
0889-1591/

population for COVID-19 outbreak are provided by national hospitals and community mental health centers throughout the country (Park and Park, 2020). In Taiwan, the Taiwan Association Against Depression (TAAD: http://www.depression.org.tw/) and Taiwanese Society for Nutritional Psychiatry Research (TSNRP: www.tsnpr.org.tw/) has been launching several mental supportive programs since early February, as well as the very early official regulation about the borders, setting the price of masks, using government funds and military personnel to increase mask production, and integrating national health insurance database with the immigration and customs database to begin the creation of big data for analytics, which has been considered an example of how a society can respond quickly to reduce anxiety and panic response (Wang et al., 2020). In summary, infected patients, uninfected quarantined individuals, and medical professionals working in pandemic areas all require mental health supporting strategies. Epidemiological studies of potential long-term psychiatric sequelae in such groups are essential.

We should address both physical and biopsychosocial aspects of this infection. Psychiatric morbidity is an important concern, as the virus may affect the central nervous system and provoke systemic inflammation (Arabi et al., 2015). A recent paper reported that COVID-19 infection triggers the release of pro-inflammatory cytokines, including interleukin (IL)-1b and IL-6 (Conti et al., 2020). Furthermore, psychosocial stresses imposed by societal changes in response to this epidemic viral infection may increase psychiatric problems. Over 50% of patients infected by SARS and MERS experienced psychological distress (Mak et al. 2009; Kim et al., 2018). Although the psychological impact of COVID-19 remains unclear, infected patients may experience anxiety, depression, guilt, stigma, and anger. The emotional problems thus may reduce immunity and compromise recovery.

COVID-19 is highly contagious because most persons lack immunity against this novel virus. Current COVID-19 therapy involves only treatment of symptoms, supportive care and prevention of complication, but no targeted medication is yet available. Therefore, the best strategy remains prevention, namely the reduction of pathogen exposure and enhancing individual immunity. Studies have shown that a healthy lifestyle, regular exercise, balanced nutrition, quality sleep and a strong connection with their families and communities are all associated with a boost to the immune system. During this outbreak, social distancing or wearing masks might help us to prevent infection, yet don't let these measures prevent us from expressing compassion and friendliness. Indeed, all forms of psychological support should be routinely implemented not only to consider psychological resilience but also to enhance psychoneuro immunity against COVID-19.

Acknowledgements

The authors of this work were supported by the following grants: the Basic Science Research Program through the National Research Foundation of Korea (NRF-2017R1A2B4010830); the MOST 106-2314-B-039-027-MY3, 108-2320-B-039-048, 108-2813-C-039-133-B and 108-2314-B-039-016 from the Ministry of Science and Technology, Taiwan; NHRI-EX108-10528NI from the National Health Research Institutes, Taiwan; MYRG2018-00242-ICMS from University of Macau, China; CMRC-CMA-3 from Higher Education Sprout Project by the Ministry of Education (MOE), Taiwan; CMU108-SR-106 from the China Medical University, Taichung, Taiwan; and CRS-108-048, DMR-108-216 and DMR-109-102 from the China Medical University Hospital, Taichung, Taiwan.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bbi.2020.03.025.

References

Arabi, Y.M., Harthi, A., Hussein, J., Bouchama, A., Johani, S., Hajeer, A.H., Saeed, B.T., Wahbi, A., Saedy, A., AlDabbagh, T., Okaili, R., Sadat, M., Balkhy, H., 2015. Severe neurologic syndrome associated with Middle East respiratory syndrome corona virus (MERS-CoV). Infection 43, 495–501.

Brooks, S.K., Webster, R.K., Smith, L.E., Woodland, L., Wessely, S., Greenberg, N., Rubin, G.J., 2020. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. Lancet 395, 912–920.

Conti, P., Ronconi, G., Caraffa, A., Gallenga, C.E., Ross, R., Frydas, I., Kritas, S.K., 2020. Induction of pro-inflammatory cytokines (IL-1 and IL-6) and lung inflammation by COVID-19: anti-inflammatory strategies. J. Biol. Regul. Homeost. Agents 34 [Epub ahead of print].

Kim, H.C., Yoo, S.Y., Lee, B.H., Lee, S.H., Shin, H.S., 2018. Psychiatric findings in suspected and confirmed Middle East Respiratory Syndrome patients quarantined in hospital: a retrospective chart analysis. Psychiatry Investig. 15, 355–360.

Kim, S.W., Park, W.Y., Jhon, M., Kim, M., Lee, J.Y., Kim, S.Y., Kim, J.M., Shin, I.S., Yoon, J.S., 2019. Physical health literacy and health-related behaviors in patients with psychosis. Clin. Psychopharmacol. Neurosci. 17, 279–287.

Lee, S.M., Kang, W.S., Cho, A.R., Kim, T., Park, J.K., 2018. Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. Compr. Psychiatry 87, 123–127.

Mak, I.W., Chu, C.M., Pan, P.C., You, M.G., Chan, V.L., 2009. Long-term psychiatric morbidities among SARS survivors. Gen. Hosp. Psychiatry 31, 318–326.

Park, S.C., Park, Y.C., 2020. Mental health care measures in response to the 2019 novel coronavirus outbreak in Korea. Psychiatry Investig. 17, 85–86.

Wang, C. J., Ng, C. Y. & Brook, R. H. (2020). Response to COVID-19 in Taiwan: Big Data Analytics, New Technology, and Proactive Testing. JAMA.

http://ncov.mohw.go.kr/bdBoardList_Real.do?brdId=1&brdGubun=11&ncvContSeq=&contSeq=&board_id=&gubun= Accessed 21 March, 2020.

http://www.nhc.gov.cn/jkj/s3577/202002/f315a6bb2955474c8ca0b33b0c356a32.shtml Accessed 21 March, 2020.