



Human behavioural changes in pandemics

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SUMMARY: Severe Acute Respiratory Syndrome (SARS), Aging, Reactive Oxygen Species and Human Demeanor or behavior are interlinked in and through biological phenomenon. SARS is a disease consisting of two phases, including a prodromal influenza-like period characterized by myalgia, malaise, chills and fever, followed by the onset of respiratory and gastrointestinal symptoms. There are five main points of interest in the immune response in SARS that could be influenced by an aging immune system: (1) heightened basal inflammation (inflammaging) at the point of SARS-CoV-2 inoculation may predispose older adults to an already pro-inflammatory local environment; (2) innate immune cell dysfunction associated with aging may alter early immune responses; (3) delayed and/or diminished adaptive responses due to poor naive clonal diversity, weak or ineffective pre-existing immunity and poor T cell priming; (4) altered T cell effector function and antibody responses due to immunosenescence; and (5) the possibility of a reduced memory response and potential long-lasting effects on the immune system that may further promote immunosenescent phenotypes. All these effects affect aging and human behavioral changes as common biological phenomenon. We did conduct this study regarding human anxiety, and obsessive compulsive disorder in 350 COVID-19 victimized patients from which 320 patients completed this study. Male and female patients were included. Written consent was taken and research study was conducted at KIMS, Karachi Pakistan. At the end of the study, we concluded that over 320 participants there is high prevalence of anxiety in males as compared to female weather there no difference in values of OCD in both genders, sample presenting a pathological score for at least one disorder. Considering the alarming impact of COVID-19 infection on mental health, now suggest assessing psychopathology of COVID-19 survivors, to diagnose and treat emergent psychiatric conditions, monitoring their changes over time, with the aim of reducing the disease burden, which is expected to be very high in patients with psychiatric conditions. This will also allow investigating how the immune-inflammatory response translates into psychiatric illness improving our knowledge in the etiopathogenesis of these disorders.

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INTRODUCTION:

Inflammation in Covid-19 infection, aging process, Reactive Oxygen Species' effects do influence human behavior. These processes are interlinked in biological system of human existence¹. SARS is a disease consisting of two phases, including a prodromal influenza-like period characterized by myalgia, malaise, chills and fever, followed by the onset of respiratory and gastrointestinal symptoms². There are five main points of interest in the immune response in SARS that could be influenced by an aging immune

system: (1) heightened basal inflammation (inflammaging) at the point of SARS-CoV-2 inoculation may predispose older adults to an already pro-inflammatory local environment; (2) innate immune cell dysfunction associated with aging may alter early immune responses; (3) delayed and/or diminished adaptive responses due to poor naive clonal diversity, weak or ineffective pre-existing immunity and poor T cell priming; (4) altered T cell effector function and antibody responses due to immunosenescence; and (5) the possibility of a reduced

memory response and potential long-lasting effects on the immune system that may further promote immunosenescent phenotypes³. All these effects affect aging and human behavioral changes as common biological phenomenon⁴. Obsessive Compulsive Disorder (OCD) is characterized by the presence of obsessions (which are unwanted and unpleasant thoughts, images, or urges) and/or compulsions (repetitive behaviors or mental rituals aimed at reducing the distress provoked by obsessions). Cleanliness, contamination, and fear of contracting a disease, which are topics of concern for patients with OCD, have now become a central theme of news and social media. Thus, we would like to elaborate on some possible implications of the COVID-19 pandemic for both diagnosis and clinical decision making about OCD⁵. Patients may experience a worsening of OCD symptoms in different dimensions, including, but not limited to, contamination/cleaning, aggression, and hoarding dimensions. Patients who had never presented such symptoms may experience their onset in the context of this major environmental change. Higher levels of avoidant behavior are also expected. Moreover, OCD patients can experience a worsening of depression and anxiety symptoms during major life events, among which the current pandemic should be included¹⁰. Exposure and ritual prevention, a key behavioral technique in OCD treatment, should be carefully tailored during this period. Recommending unrestricted exposure to feared stimuli may prove imprudent. Psychological strategies for treating OCD should consider the well-being and safety of patients. Pharmacological strategies should be guided by the best evidence-based recommendations¹¹. Protection recommendations (e.g., hand washing) can reinforce the irrational beliefs of patients with OCD and poor insight. Therefore, engagement in exposure and ritual prevention activities may be lower, which could impact the long-term prognosis for OCD¹². We assumed that patients and their relatives would show similar increased levels of anxiety, and that anxiety levels would be higher than depressive levels. This hypothesis is based upon the unpredictable nature of the COVID-19 and the accompanying uncertainty regarding the course of the illness and its infectious potential, which are key factors for anxiety¹³. Among relatives, we hypothesized that children would show decreased anxiety and depression levels, compared to adult relatives. This hypothesis is based on the notion that although children have to deal with the same negative feeling of anxiety as adults, they do not share the same objective burdens as adults, such as caring for family function at this difficult time¹⁴⁻¹⁶. Primary goals of the innate immune system in response to a viral infection are (1) to initiate a local inflammatory

response to activate and recruit immune cells, (2) to directly eliminate virally infected cells and (3) to prime the adaptive immune response. As we age, the ability to achieve these three goals is either diminished or dysregulated¹⁷⁻⁸. Pathological features of COVID-19 are not unique to SARS and that diffused alveolar damage may also be caused by several other agents, such as bacteria, oxygen toxicity, trauma and drugs. Therefore, differentiation between cases of SARS and non-SARS pneumonia may not be definitively based on the features of pulmonary histopathology without confirmation by additional tests such as in situ hybridization, RT-PCR, and virus isolation¹⁹⁻²⁰.

Subjects and Methods

In this study non-probability sampling was used. Place of study was Karachi Institute of Medical Sciences (KIMS) Karachi Pakistan conducted for six months from March 2021 to August 2021. The Study was cross sectional study.

Study was carried out among Covid-19 infected patients.

A total of 320 patient completed this study. Non - Probability Convenient Sampling was applied Sample size $n = 320$ Where $n =$ sample size $z = z$ value corresponding to a given confidence level $= 1.96$ $p =$ % frequency of the outcome factor $= 58$ % $c =$ standard error/ effect size $n = 320$.

Encompassing 1) those patients which are positive for COVID 19. 2) isolate for COVID 19.

3) Should gone through the symptoms of anxiety and OCD. Eliminating 1) those patients which were admitted in hospital. 2) Any previous history of psychiatry disorders. 3) those which are not isolated for COVID19. Data is collected through a purposefully structured form for post isolated COVID19 patients. Patient who volunteered were asked to fill the questionnaire and demographic performa after informed consent was obtained from each one of them. The participants could choose multiple reasons as applicable to themselves. Data was collected regarding symptoms and severity of anxiety and obsession compulsive disorders (OCD) in COVID 19 patient after isolation. For data collection procedure regarding anxiety, we used Hamilton Anxiety Rating Scale (HAM-A)¹⁹ and for obsession compulsive disorders (OCD) we used Yale – Brown scale²⁰. Hamilton Anxiety Rating Scale (HAM-A). The HAM-A was one of the first rating scales developed to measure the severity of anxiety symptoms, and is still widely used today in both clinical and research settings. The scale consists of 14 items, each defined by a series of symptoms, and measures both psychic anxiety (mental agitation and psychological distress) and somatic anxiety The scale consists of 14 items, each defined by a series of symptoms, and measures both psychic anxiety (mental agitation and

psychological distress) and somatic anxiety (physical complaints related to anxiety). Although the HAM-A remain widely used as an outcome measure in clinical trials, it has been criticized for its sometimes-poor ability to discriminate between anxiolytic and antidepressant effects, and somatic anxiety versus somatic side effects. Each item is scored on a scale of 0(not present) to 4 (severe), with a total score range of 0-56, where greater than 17 indicates mild severity, 18-24 mild to moderate severity and 25-30 moderate to severe. The Yale-Brown Obsessive-Compulsive Scale is a standardized rating scale with both clinician administered and self-report versions available, measuring 10 items pertaining to obsessions and compulsions on a five-point Likert scale. Scores range from 0 (no symptoms) to 4 (severe symptoms), and a total score is calculated by summing items 1 to 10 and can range from 0 to 40. The data were entered and analyzed on SPSS V26.0. Frequency and percentages tables were presented.

RESULTS:

Demographic Characteristics

The study data was collected from 320 patients. Analysis of data collected about patients is

N=320 patients involved in the survey, Females N=113 (35.4%) whereas N=207 (64.6%) were males. Patient's qualifications, results demonstrated that (3.7%) patients had a primary education, (1.8%) patients had a middle education, (3.7%) patients had a matric level education, (8.6%) had an intermediate level education, (55.2%) had undergraduate educational qualification, (25.5%) patients had a post graduate qualification. Further age, (75.2%) had age between 20-30 years, (10.1%) had age between 30-40 years, (5.2%) had age between 40-50 years, (7.7%) had age between 50-60 years. Data on current employment status revealed that there were (62.3%) patients with current employment and (35.9%) patients were without employment. Patients' marital status, (70.9%) patients were single, (25.8%) patients were married, (6%) patients were divorced. Regarding monthly household income, (40.5%) had below 50,000, 79 (24.2%) had above 50,000, 109 (33.4%) had above 1,00,000. Family structure, (52.5%) had nuclear, (39.9%) had joint, (5.8%) had extended family structure.

Data on methods used for screening Covid-19, (89.0%) were through PCR and (9.2%) were through serology. Data on isolation, (96.0%) were isolated at home and (4%) were isolated at hospital. Further analysis shown in Table 2.1 of the survey data obtained in this project specifically for OCD

and anxiety in post COVID patients shows that gender has no effect on anxiety levels with almost equal ratios for males and females i.e., there are (64.6%) were males and females accounted for

(35.4%).

Discussion

Indeed, finding a healthy balance between addressing a threat versus suppressing thoughts about it can be difficult. In some cases, the decreases in anxiety from avoidance can tip the balance too far, strengthening beliefs regarding danger and the need to avoid. While previous studies have recently been published on OCD in clinical populations during the pandemic²¹, the presence of intrusive thoughts, or obsessions, in the general population has not been studied to our knowledge at this point. The previous study only included students enrolled in undergraduate or graduate studies at a state university with a limited sample size. However, young adults have been identified as an at-risk population for mental health issues specifically during this pandemic²². The previous study investigates psychopathology in a sample of COVID-19 survivors at one month follow-up after hospital treatment²³. They reported high rates of PTSD, depression, anxiety, insomnia, and OC symptomatology. The findings of the psychiatric morbidities ranged from 10% to 35% in the post-illness stage²⁴ With regard to the risk factor related to psychopathology, consistently with previous epidemiological studies have found that females, and patients with positive previous psychiatric diagnoses, suffered more in all psychopathological dimensions²⁵. Moreover, outpatients showed increased anxiety and sleep disturbances, while the duration of hospitalization inversely correlated with PTSD, depression, anxiety, and OC symptomatology. Also considering the worse severity of COVID-19 in hospitalized patients, this observation suggests that less healthcare support could have increased the social isolation and loneliness typical of COVID-19 pandemics, thus inducing more psychopathology after remission²⁶. Finally, younger patients showed higher levels of depression and sleep disturbances, in agreement with previous studies describing a worse psychological impact of COVID-19 pandemic in younger people²⁷. Neither oxygen saturation level at follows up nor baseline inflammatory markers associated with depression, anxiety, PTSD nor insomnia, suggesting that psychiatric symptomatology was not a manifestation of physical symptoms, with the exception of baseline SII that positively associated with measures of anxiety and depression at follow-up. The SII is an objective marker of the balance between host systemic inflammation and immune response status considering together neutrophil, platelet, and lymphocyte all of them involved in different pathway of immune/inflammatory response²⁸. Since the emergence of the COVID-19 pandemic and the significant changes that impacted because of it, people

around the world have been left dealing with its consequences—fear of becoming ill and dying, fear of losing loved ones, uncertainty about the future, and imposed social isolation—several elements which could lead to psychological consequences. In fact, all symptoms of anxiety or OCD are due to large scale derangements of chemicals present biological source (Human Body). These factors contribute in excessive ROS stress, aging and immunity disbalance.

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