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Covid-19 and Human Health

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Abstract

COVID-19 and its etiological agent, SARS-CoV-2, have been the main protagonists in the last two years, since December 2019, in all social media around the world. Besides the viral threat, particularly to debilitated people by diverse morbid conditions, mainly cardiorespiratory pathologies, this coronavirus and its related disease pose like a flag to all and different kind of socioeconomic and political directions, confusing people everywhere, displacing simple and rational measures to contain the virus spread and disease evolution. Fear and panic obliterated the peoples' common sense, exposing psychologically distressed populations to a gamma of misinformation, and consequentially misconducted behavior, sometimes aggravating even more their health conditions, becoming an easy host for virus infection/replication and disease evolution, which depending on many factors could culminate in death or chronic illness. Anyhow, our immune system is becoming more familiar to SARS-CoV-2, and gradually an equilibrium between the host and the novel virus has been established, which possibly means that future human generations and other vertebrate species would have acquired new viral genetic information in this dynamic flow of genes among eukaryotic, prokaryotic, and viral organisms.

Officially reported in December 2019, the novel Coronavirus Disease 2019 (COVID-19) and its etiological agent, the Severe Acute Respiratory Syndrome Coronavirus type 2 (SARS-CoV-2) [1] were utilized by the general media to generate, among human populations, a worldwide panic, fear and consequential acute stress. Besides virus susceptibility to infection, human cells are devoided of appropriate protection by the immune system as submitted to signaling of neuronal cells under stress conditions [2,3]. Both factors, cell viral infection susceptibility and immunosuppression, associated to comorbidities, mainly determined by nutritional habits, constitute an orchestrate mechanism leading SARS-CoV-2 infected subjects to evolve into a full COVID-19 condition [4-7]. SARS-CoV-2 related diseases are not solely a consequence of virus infection, otherwise mainly correlate to genetic, epigenetic, and environmental factors [8-10]. Usually, the majority of SARS-CoV-2 infected subjects experiences mild symptomatology or no signs of infection [11-13], but it is known that infection occurred by the detection of specific IgM and IgG production in response to the presentation of diverse virus antigens produced during virus replication, which also are obligatorily associated to the host T cell priming in its role to stimulate B lymphocytes to differentiate into plasma cells, as also the participation of other antigen presenting cells [14,15]. A tiny fraction of SARS-CoV-2 infected subjects, usually presenting cardiorespiratory comorbidities, progresses to an acute pulmonary inflammation in response to an abnormal cytokine storm, ultimately characterizing the COVID-19 [16]. As previously mentioned, panic and fear play a major role in the infection outcome, but also, the face mask utilization also contributes to undermine, directly and indirectly, the immune system. Masks do not retain 110 nm viral particles but do accumulate procaryote and eucaryote pathogens, promote the growth of these organisms in humidified masks, as also exponentially favor pathogens reproduction and reentrance into the respiratory and digestive tract, altering the host respiratory and intestinal microbiota, posing threat to masked persons [17,18]. Besides, acidity resulting from elevated concentration of carbon dioxide as imposed by the mask barrier, promotes the growth and dissemination of cancer cells in the body, and of other exogenous pathogens [19-24].

Review

Rapid development of vaccines, not only of the traditional ones based on the whole inactivated virion, but also genetic vaccines constituted of messenger RNA to be translated, in the inoculated persons' cells, into the SARS-CoV-2 spike aminoacidic sequence, as also DNA vaccines of modified simian adenovirus DNA harboring nucleotide sequences coding for SARS-CoV-2 spike aminoacidic sequence, have been produced, massively commercialized and inoculated in large number of people in populations all around the globe [25,26]. Previously to the releasing of these vaccines, many investigators essentially dealing in the fields of virology, microbiology, vaccinology, immunology and infectiology, warned about the serious risks of a fast immunogen development to a long RNA genome virus, prone to so many genetic variations or mutations, taking into account its introduction in the human population and the time required for the novel virus to adapt to its new human host [27-29]. So, during these 2 last years, time by time, new SARS-CoV-2 variants have emerged and the last one, the Omicron and its subvariant are substantially less lethal and more infectious, behaving as a natural "vaccine" [30,31]. Besides, the SARS-CoV-2 commercialized vaccines induce a short period of protection that rapidly vanish and, more seriously, side effects, including death in all ages [32-35]. Current protocols of SARS-CoV-2 immunization, independently of age, in successive doses' applications in a short time, will force the renewal of immune cells, mainly T and B lymphocytes, by the bone marrow, and recruitment of T cells from other body compartments. These feedback mechanisms to replace active lymphocytes, with a short lifespan, will provoke the exhaustion of stem

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cells committed to differentiated into B and T lymphocytes, as other cells collaborating in the immune response [36-38]. In a natural virus infection process, innate immune mechanisms protect the host, and just in few cases, the adaptative immune response is connected to the innate mechanism, and usually generate a robust and long-lasting immune protection [39], contrary to the artificial immunization that directly stimulate T and B lymphocytes [40,41]. Another issue, concerning genetic vaccines, directly or indirectly inoculating expressive amounts of messenger RNA, would enhance the probability of SARS-CoV-2 spike RNA sequences to migrate to the cell nucleus and integrate, after reverse transcription by cell LINE elements (endogenous reverse transcriptase), in the host cell DNA. Depending on its insertion loci, cell's gene function could be altered as the activation of protooncogenes, which would contribute to cancer development [42,43].

Vaccine commercialization has tried to prevent the development of other preventive and curative therapies, nevertheless, general population affordable drugs as chloroquine, hydroxychloroquine and ivermectin have been employed in therapeutic protocols, and an expressive number of clinical trials have demonstrated the efficacy of these drugs [44,45]. Besides, vitamins and minerals have assured the protective role in disease development as Vitamin D and C, Zinc, Selenium, etc [46-48]. Other therapeutic protocols include also monoclonal antibodies to neutralize SARS-CoV-2 virions [49].

Measures to mitigate virus spread, in human communities, target to reduce persons' respiratory virus transmission [50], anyway, few studies explore the potential transmission of SARS-CoV-2 in fecal material [51,52], as both respiratory and digestive tract mucosae display epithelial cell receptors, mainly the angiotensin converting enzyme 2 (ACE-2) utilized by SARS-CoV-2 to mediate interaction with the virus glycosylated S spike protein and infect host epithelial cells [53,54]. Comparing the mucosal area of respiratory and digestive tract, the potential amount of virus replication is much more significative in the digestive tract [55-57]. Even that, the primary site of virus infection and replication takes place in the upper respiratory tract [58,59], mucus carrying cell debris and virus particles are constantly swallowed favoring virus infection of intestinal epithelial cells and virus shedding in the feces [60,61]. Therefore, it could be assumed that sewage pipes in residences and buildings carry the main virus cargo that could be released in urban and rural areas previously to reach sewage treatment plants, as fecal organic fermentation by procaryotes produces large amount of gases that are spread in the environment containing also aerosolized and microorganic particles containing virions [62-64]. Fecal organic matter protects virus particle against environment factors as solar radiation, and weather conditions could facilitate and maintain fecal material containing virus desiccated for long periods in nature. During rainy seasons, these infectious organic matter will be rehydrated and suspended in the air, being easily inhaled, or swallowed by human beings and animals [65,66].

In conclusion, rational management of worldwide spread of pathogenic organisms should be carried out without mischievous political involvement and thoroughly discussed scientific data.