Mini Review

Obesity and Covid-19: The Clashing of Two Pandemics

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The lethality of the COVID-19 pandemic is due, in large part, to the declining health of the world's population. Cava et al. [1] described 2020 as a collision between two pandemics, obesity, a chronic non-communicable disease, and the highly infectious corona virus disease (COVID-19). The National Health and Nutrition Examination Survey (NHANES) for 2017-2018 estimated that 42.5% of US adults aged 20 and above were obese, with 9% severely obese, and another 31% overweight. Obesity is defined as an abnormal and excessive accumulation of fat that presents a risk to health [2]. The World Health Organization (WHO) defines obesity as individuals with a Body Mass Index (BMI) of 30kg/m^2 or greater. In 2019, the global adult obesity rate was reported by the Food and Agriculture Organization of the United Nations (FAO) to be approximately 13.2% [3]. However, with confinement and lockdowns over the past two years, it is likely to be much higher. For example, Breton et al. [4] reported that during lockdown in Spain between April and May 2020, a combination of higher food intake and a more sedentary lifestyle, was likely responsible for a weight gain of between 1 to 3kg by almost half of the population. An increasing body of evidence indicates that the outcome of COVID-19 is far worse for obese and overweight individuals with a significant number requiring intensive care [5-7]. Obese individuals have a 46% higher risk for COVID-19 infection and twice the risk of hospitalization [8]. The excess weight places these individuals at a much greater risk of disease severity with a 73% increased chance for admission to an ICU, and a 69% increased need for assisted mechanical ventilation. Impaired respiratory and pulmonary functions, together with such metabolic disorders as diabetes and cardiovascular disease, are features of obesity that further increase the risk for severe COVID-19 and its complications [9].

There are a number of mechanisms by which obesity promotes the severity of COVID-19 disease as well as further complications. For example, the frequent association of obesity with insulin and leptin resistance seriously impairs viral clearance. In addition, fat cells or adipocytes produce a receptor, an angiotensin converting enzyme 2 (ACE-2), which SARS-CoV-2 binds to in order to enter the cell. The expression of this receptor is increased in the adipose tissue and lungs of obese individuals which could explain their greater susceptibility to SARS-CoV-2 infection. Consequently, adipose tissue could become a reservoir for the virus [10]. Besides nutrition, physical activity plays an important role in both mental and physical health. The World Health Organization (WHO) reported that globally, 1 out of every 4 adults are not active enough and are at a high risk for sarcopenia (loss of muscle mass, strength. and function) and impaired cardiovascular fitness. Depression was reported to be at least 25% higher among the obese population, particularly the severely obese, and is a predisposing factor for mental illness [11].

The multiple lockdowns since the start of the pandemic can only further exacerbate this situation by limiting physical activity, particularly for those suffering from obesity. The COVID-19 pandemic has highlighted the urgency of developing a strategy for preventing and reducing obesity worldwide. Such populations not only suffer from multiple chronic diseases but are extremely susceptible to pandemics such as COVID-19. Decreasing obesity is

crucial for improving the health of the world's population, while at the same time, mitigating the astronomical health costs that will incur if nothing is done.

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Conflict of interest

None.

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