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SARS-CoV-2-host dynamics: Increased risk of adverse outcomes of COVID-19 in obesity

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ABSTRACT

Background and aim: The pandemic of COVID-19 has put forward the public health system across countries to prepare themselves for the unprecedented outbreak of the present time. Recognition of the associated risks of morbidity and mortality becomes not only imperative but also fundamental to determine the prevention strategies as well as targeting the high-risk populations for appropriate therapies.

Methods: We reviewed, collated and analysed the online database i.e. Pubmed, Google scholar, Researchgate to highlight the demographic and mechanistic link between obesity and associated risks of severity in COVID-19.

Results: We observed a changing dynamic in the reporting from the time of initial pandemic in China to currently reported research. While, initially body mass index (BMI) did not find a mention in the data, it is now clearly emerging that obesity is one of the profound risk factors for complications of COVID-19.

Conclusion: Our review will help clinicians and health policy makers in considering the importance of obesity in making the prevention and therapeutic strategies of COVID-19. An extra attention and precaution for patients with obesity in COVID-19 pandemic is recommended.

1. Background

On December 31, 2019 several cases of pneumonia with an unidentified origin emerged from Wuhan, China which were reported to World Health Organisation (WHO) [1].The cause of these cases was confirmed to be severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) after a week [2]. Considering its spread; the outbreak was declared a Public Health Emergency of International Concern on January 30, 2020 and later WHO announced a name for the new coronavirus disease as COVID-19 [3].

As of July 14, 2020 there have been 1,29,64,809cases and 45,70,288 deaths globally due to COVID-19 spanning across all countries with USA, Brazil and Europe reporting the maximum load [4].

While most people with COVID-19 develop no symptoms or have only mild illnesses, the evidence from China indicate that approximately 14% develop severe disease that requires hospitalisation and oxygen support, while 5% require admission to an Intensive Care Unit (ICU) [5].

Due to the mounting public health concerns about COVID 19 worldwide, scientists have been poring over data about the spectrum of clinical manifestations of COVID-19. Certain factors such as age and co-morbidities like hypertension, diabetes and cardiovascular disorders have mostly been found to be associated with severe illnesses requiring robust measures and support from health care system [6]. Such an association with obesity and high BMI has been insufficiently reported and considering it as the forerunner of many of these co-morbidities, it becomes inevitable to investigate an association of obesity with severe outcomes of COVID-19.

Nonetheless, the exact mortality rate varies greatly between regions and countries which can partly be due to the varying extent of testing and also possibly be due to differing trajectories based on population demographics and quality of health care availability.

Keeping in mind that there is lack of herd immunity and absence of an effective vaccine and antiviral therapy, countries are bound to take stringent measures to flatten the transmission curve in order to cope with the demands of health care systems. Thus, taking into account evidence and lessons from the ongoing situation of COVID-19 from different parts of the world, it becomes imperative to identify which patients are most at risk for hospitalisation. It can

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