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Letter to the Editor

Normal weight obesity and COVID-19 severity: A poorly recognized link



People with obesity (those with high body mass index (BMI)) and coronavirus disease 2019 (COVID-19) are at increased risk of requiring intensive care unit admission and mechanical ventilation, and death [1]. Although BMI is a commonly used measure of obesity in clinical settings, it cannot delineate fat-free mass from adipose tissue [2]. Thus, people with normal weight on the BMI scale can have elevated body fat percent, particularly in the visceral area, an entity called normal weight obesity (NWO) [2,3]. Indeed, emerging evidence shows that visceral adiposity, independent of BMI, is associated with high risk of critical illness in patients with COVID-19 [4,5]. Identifying NWO individuals, who are at high risk for metabolic dysregulation and cardiometabolic disorders [3,6], is often and easily overlooked in clinical practice, where screening for obesity is based solely on BMI [3].

Reports from the USA and the UK show that South Asians, blacks, and other ethnic minorities are more likely to contract COVID-19 and experience severe forms of illness compared with whites [7,8]. While these could be due to differences in socioeconomic, cultural, or lifestyle factors [8], the role of excess body fat cannot be ignored. South Asians and blacks generally have a higher body fat percent than whites for a given level of BMI [9,10]. Several potential mechanisms for poor COVID-19 outcomes in obese people, including endothelial dysfunction, insulin resistance, immune dysfunction, and chronic inflammation [11], are directly related to excess amounts of body fat [3]. Moreover, certain key cytokines involved in the pathogenesis and disease progression of COVID-19, such as interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF-alpha) [12], are also synthesized in adipose tissue [13]. These cytokines are usually elevated in individuals with increased body fat, irrespective of their BMI [3]. Thus, adipose tissue can act as a reservoir for the virus, leading to increased and prolonged viral shedding [11].

The use of the sagittal image of chest computed tomography (done routinely to diagnose COVID-19 pneumonia) to assess visceral adiposity [4,5], along with BMI, is a promising strategy to identify NWO individuals in clinical settings. Understanding the association between NWO and COVID-19 disease severity could inform better risk stratification and

management of COVID-19 patients, especially those of South Asian and African origins.

Funding

None.

Author contributions

TS conceived the idea, conducted the literature search, and draft the first version of the manuscript. NK reviewed and edited the manuscript. Both authors approved the submission of the manuscript.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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