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Short Communication

The intersection between COVID-19 and obesity in the context of an emerging country



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SUMMARY

Background & aims: The worldwide outbreak of the coronavirus disease 2019 (COVID-19) has already caused a substantial public health burden. Increasing number of studies linked obesity to more severe COVID-19 consequence and mortality, challenging health systems worldwide, especially in emerging countries like Brazil. Herein, we aimed to search the literature and present the current intersection between obesity and COVID-19 in the Brazilian population.

Methods: One hundred twenty-five articles were initially searched after duplicate removal, and nine were finally included in our analysis.

Results: Our findings emphasized the magnitude of COVID-19 infection in Brazil and the impact of obesity as a risk factor that aggravates the prognosis of outpatients or hospitalized patients. We also demonstrated social aspects of COVID-19 that could act enhancing the obesity condition in Latin American countries.

Conclusions: A more careful look at the available data could help to understand better the dynamic between obesity and COVID-19, focusing on the Brazilian population and could eventually guide management strategies and therapies for COVID-19 in the future.

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1. Introduction

The pandemic Coronavirus Disease-19, officially designated COVID-19, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has become a public health emergency of international concern [1]. As of 26 April 2021, more than 147 million people have been infected with SARS-CoV-2, and more than 3 million deaths worldwide were attributed to COVID-19 [2].

In Brazil, from 3 January 2020, there have been 14,340,787 cases of COVID-19 with 390,797 deaths reported to WHO, in the world's third-worst outbreak outside the United States and India [2]. The lethality rate (deaths/cases*100) in Brazil is 2.7%, and per Brazilian regions, the southeast exceeds the national rate, mainly due to the

high mortality rate in São Paulo state, the most populated state in Brazil [3] (Table 1). Compared with other Latin American countries, such as Colombia (2.57%), Argentina (2.15%), and Chile (2.21%), the lethality rate in Brazil is similar, but it is lower than Peru (3.39%), Ecuador (4.88%), and Bolivia (4.31%) [2].

According to these data, Brazil became the epicenter of the COVID-19 epidemic. Global health authorities are concerned about the impact of the COVID-19 pandemic in middle and low-income countries due to weaknesses in the health systems and the prevalence of morbidities [4]. Obesity and its repercussions constitute an important source of morbidity and impaired quality, especially in Brazil, since the prevalence of obesity and overweight is high in the country and has increased significantly [5].

The knowledge of obesity as a risk factor of Brazilian COVID-19 patients can assist in physicians' decision-making to implement early and most appropriate measures for poor prognosis patients. Thus, this short communication is intended to highlight the impact of COVID-19 in patients with obesity in the Brazilian population.

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Table 1
Cases, deaths, incidence, mortality, and lethality overview in Brazil and regions.

	Cases	Deaths	Incidence/100 thousand inhabitants	Mortality/100 thousand inhabitants	Lethality rate (%)
Brazil	14,369,423	391,936	6837.8	186.5	2.73
Midwest	1,510,231	37,097	9266.9	227.6	2.46
South	2,756,078	59,106	9194.3	197.2	2.14
North	1,474,490	37,126	8000.1	201.4	2.52
Northeast	3,311,694	81,233	5802.7	142.3	2.45
Southeast	5,316,930	177,374	6016.6	200.7	3.34

Source: State Health Departments Brazil, 2021 [3].

2. Methods

All the co-authors accessed the PubMed and Google Scholar databases to identify relevant English-language articles published up to 26 April 2021. The search terms included “human, coronavirus, COVID-19, SARS-CoV-2, obesity, complications, Brazil, Brazilian population, emerging countries”. One hundred and twenty-five articles were initially selected, and additional publications of relevance to the present article were identified by reviewing the references of the eligible articles.

3. Results and discussion

Brazil's challenges in the face of the COVID-19 are concomitant to many issues, including social, economic, political, and genetics (admixed population with high variability at genome level) aspects [6]. Also, Brazil has many risk groups described by WHO, like those older than 60 years and with prognostic comorbidity, which may occur when diseases predispose the patient to develop severe COVID-19 symptomatology [6].

There is emerging evidence that COVID-19 and its severity are associated with overweight and obesity [1,7]. According to the National Survey of Health (PNS) 2019, released by the Brazilian Institute of Geography and Statistics (IBGE), in partnership with the Ministry of Health, the percentage of obese adults in Brazil more than doubled in 17 years, reaching 26.8% in 2019 [5]. In the same period, the proportion of overweight adults changed to 61.7% and represented almost two-thirds of the Brazilian population [5]. Obesity is a risk factor for many chronic non-communicable diseases (NCD), and in 2018, more than 74% of all deaths in Brazil are attributed to NCDs, such as cardiovascular diseases and diabetes mellitus [5]. Also, the importance of obesity for infectious diseases has recently received increasing recognition as emerging data have indicated an association between obesity and poor outcome in pandemic coronavirus disease-2019 (COVID-19) [1,7].

After the initial selection of the one hundred and twenty-five articles, our advanced research identified nine studies referencing “obesity, COVID-19, and Brazilian population”. Of these, de Souza et al., 2021, on the analysis of mortality risk factors for hospitalized COVID-19 patients using the major Brazilian database, found that the rate of hospitalized COVID-19 patients with obesity was 11.76%, of whom 43.40% died [8]. Also, they showed a significant hazard ratio for BMI ≥ 40 kg/m² associated with higher mortality risk [8]. Nunes et al., 2020 measure the occurrence of multimorbidity to estimate the number of individuals in the Brazilian population 50 years or older at risk for severe COVID-19 [4]. They observed that among a list of 15 diseases considered risk conditions for severe COVID-19, cardiovascular diseases and obesity were the most frequent chronic conditions [4]. Carneiro et al., 2021 observed a positive correlation between the prevalence of overweight/obesity and the overall mortality due to COVID-19 in 26 state capitals and the Federal District of Brazil [9]. Takemoto et al., 2020 showed a

high incidence of peri-obstetric mortality due to COVID-19 in Brazil and uncovered obesity as a risk factor [10].

Incipient data is emerging regarding the effect of the COVID-19 pandemic on the prevalence and incidence of obesity [1]. The long-term effects of the COVID-19 pandemic could be separated in health consequences of SARS-CoV-2 infection and the effect of the COVID-19 pandemic on health-related behavior of non-infected people [1].

Interestingly, Halpern et al., 2020 identified social aspects of the COVID-19 pandemic that could influence the rates of obesity in Latin American countries [7]. According to the authors, during the pandemic, disruptions in food supply chains and panic buying may have limited access to fresh foods, leading to greater consumption of ultra-processed foods and other foods with long shelf lives [7]. A web survey found that the increase in ultra-processed food consumption during the pandemic was more pronounced in Latin American countries (Brazil, Argentina, Colombia, and Chile) than in Europe [7]. Another concern is the risk of increased weight gain during social isolation and quarantine in Latin American countries, where public spaces for physical activity without close physical contact are less frequent, especially in more impoverished areas [7].

4. Conclusion

Taken together, the information presented here reinforced that obesity emerges as an unfavorable condition for individuals infected with COVID-19 is associated with the worst prognostic and more prominent risk of mortality. The current pandemic situation enhanced the importance of obesity as a limiting agent for individuals' health status, especially in emerging countries like Brazil. Studies in large cohorts should be carried out to assess personalized treatment in patients with obesity infected by viruses such as COVID-19 and decrease the mortality rate since obesity comprises a substantial part of the world population.

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Declaration of competing interest

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