J Arch Mil Med. 2020 March; 8(1):e108825. doi: 10.5812/jamm.108825.

Published online 2020 September 6. **Review Article**

Obesity and COVID-19

Leila Moradi [1, *]

[1]Department of Epidemiology, School of Public Health, Hamadan University of Medical Sciences, Hamadan, Iran

[*]*Corresponding author*: Department of Epidemiology, School of Public Health, Hamadan University of Medical Sciences, Hamadan, Iran. Email: leilamoradi073@gmail.com

Received 2020 August 23; **Accepted** 2020 September 05.

Abstract

Context: The emerging disease COVID-19 has made a major problem for people around the world, and treatment systems are facing hardships. Obesity is a risk factor for health, and COVID-19 is a global disease. Obesity may be a risk factor for this disease. The relationship between obesity and the disease was examined in this study.
Evidence Acquisition: Three databases, PubMed, Scopus, and Embase, were examined. The search strategy and keyword combinations were ("COVID-19" OR "Coronavirus" OR "Wuhan virus" AND "Obesity" OR "Obese"). The results of related articles were used.
Results: Obesity, diabetes, hypertension, cardiovascular, and respiratory diseases are the risk factors for COVID-19, especially in severe cases, which can affect the length of hospital stay and mortality.
Conclusions: We know very little about this disease. Thus, much research is needed to conduct. Since obesity is a risk factor for this disease, exercise is proposed to prevent it.

Keywords: COVID-19, Obesity, Risk Factor

1. Context

At the end of December 2019, Wuhan, China, suddenly became famous in the world. Several cases of acute respiratory disease were identified simultaneously. This disease was different from the known respiratory disease. Soon later, epidemiological surveys determined the origin of this outbreak. The source of the disease was a live seafood market in Wuhan City. This zoonotic disease was called COVID-19. Some patients were also reported in Hong Kong, Taiwan, and Macau. Then, it was seen in other countries and all continents and became a pandemic (1-6). COVID-19 has mild, moderate, and severe signs and symptoms. Mild-to-moderate illness with symptoms of fever, dry cough, body aches, and shortness of breath occurs up to two weeks after exposure to the virus (6, 7).

Severe patients with acute respiratory symptoms are admitted to the ICU. Mostly, the elderly show chronic illnesses (8). Obesity, diabetes, and heart disease are the risk factors for severe COVID-19. Kidney disease, cancer, and hypertension also increase the chances of developing a severe disease (9-11).

2. Evidence Acquisition

In this study, the relationship between obesity and COVID-19 was investigated. Three databases, PubMed, Scopus, and Embase, were examined. The search strategy and keyword combinations were ("COVID-19" OR "Coronavirus" OR "Wuhan virus" AND "Obesity" OR "Obese").

The articles found in these databases were collected in EndNote X8, and duplicates were removed. The titles and abstracts of the articles were studied. After identifying the relevant articles, they were selected, their full-texts were found and studied carefully, and the results were inferred.

3. Results

After an initial search, 93 articles were found, including five duplicate articles. Thus, 88 titles and abstracts were studied, 11 related articles were identified, and 7 full-text articles were found. Due to the novelty of the topic, the full-texts of some articles were not published. After reading the articles, important information was obtained about the relationship between obesity and other risk factors and COVID-19.

The age range of patients with severe disease was above 45 years, with an average of 65 years (12, 13). In the comparison of patients in different geographical areas, it was concluded that individual characteristics such as obesity were more effective than residential characteristics. Obesity is also an effective risk factor. Obesity is related to the length of hospital stay of patients. Obesity can cause breathing problems for patients, and with COVID-19, patients may

need to be admitted to the ICU more often (14). Fatalities from this disease were higher in obese older men (8). Compared to blacks and whites, deaths from the disease were higher among blacks, which may be due to differences in their economic and social status (14).

ICU patients were more likely to be obese, and some had kidney disease (11, 12). In the study of deaths due to this disease, the risk factors were obesity, a history of multiple hospitalizations in the ICU, and age over 65 years. The relationship between the length of hospital stay and death from disease was not observed, and the average length of hospital stay was five days (8). The relationship between obesity and the need for mechanical ventilation at the time of hospitalization showed that most obese and overweight patients needed more mechanical ventilation (11). Obese patients had the highest frequency and length of hospitalization, several diseases, and respiratory failure (14). Compared to moderate and mild patients, severe patients had a higher prevalence of cardiovascular disease (12). Patients with COVID-19 who had diabetes and died required more mechanical ventilation than those who survived (14). Type 2 diabetes was associated with more severe disease and higher mortality (15).

4. Conclusions

Although the disease is new and unknown, but various studies have shown a link between chronic disease and severe cases and higher mortality. The only effective way is to prevent infection by maintaining social distancing. Elderly people with chronic diseases should be very careful. Due to quarantine conditions and more stay at home, all age groups should reduce their daily calorie intake from foods and prevent weight gain by doing proper physical activity.

Footnotes

Authors' Contribution: All the steps were done only by LM.

Conflict of Interests: I have no conflict of interest.

Funding/Support: This research has no funding or support.

References

1. Hui DS, Azhar EI, Madani TA, Ntoumi F, Kock R, Dar O, et al. The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health—The latest 2019 novel coronavirus outbreak in Wuhan, China. *International Journal of Infectious Diseases*. 2020;**91**:264–6.
2. She J, Jiang J, Ye L, Hu L, Bai C, Song Y. 2019 novel coronavirus of pneumonia in Wuhan, China: emerging attack and management strategies. *Clinical and translational medicine*. 2020;**9**(1):1–7.
3. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *The Lancet*. 2020;**395**(10223):470–3.
4. Wang W, Tang J, Wei F. Updated understanding of the outbreak of 2019 novel coronavirus (2019-nCoV) in Wuhan, China. *Journal of medical virology*. 2020;**92**(4):441–7.
5. Zumla A, Niederman MS. The explosive epidemic outbreak of novel coronavirus disease 2019 (COVID-19) and the persistent threat of respiratory tract infectious diseases to global health security. *Current Opinion in Pulmonary Medicine*. 2020.
6. Alberca RW, Oliveira LDM, Branco ACCC, Pereira NZ, Sato MN. Obesity as a risk factor for COVID-19: an overview. *Critical Reviews in Food Science and Nutrition*. 2020:1–15.
7. Muscogiuri G, Pugliese G, Barrea L, Savastano S, Colao A. Comentary: Obesity: The "Achilles heel" for COVID-19? *Metabolism-Clinical and Experimental*. 2020;**108**.
8. Pettit NN, MacKenzie EL, Ridgway J, Pursell K, Ash D, Patel B, et al. Obesity is associated with increased risk for mortality among hospitalized patients with COVID-19. *Obesity*. 2020.
9. Sattar N, McInnes IB, McMurray JJ. Obesity a risk factor for severe COVID-19 infection: multiple potential mechanisms. *Circulation*. 2020.
10. Lighter J, Phillips M, Hochman S, Sterling S, Johnson D, Francois F, et al. Obesity in patients younger than 60 years is a risk factor for Covid-19 hospital admission. *Clinical Infectious Diseases*. 2020.
11. Simonnet A, Chetboun M, Poissy J, Raverdy V, Noulette J, Duhamel A, et al. High prevalence of obesity in severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) requiring invasive mechanical ventilation. *Obesity*. 2020.
12. Wu J, Li W, Shi X, Chen Z, Jiang B, Liu J, et al. Early antiviral treatment contributes to alleviate the severity and improve the prognosis of patients with novel coronavirus disease (COVID-19). *Journal of internal medicine*. 2020.
13. Goyal P, Choi JJ, Pinheiro LC, Schenck EJ, Chen R, Jabri A, et al. Clinical characteristics of Covid-19 in New York city. *New England Journal of Medicine*. 2020.
14. Richardson S, Hirsch JS, Narasimhan M, Crawford JM, McGinn T, Davidson KW, et al. Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized with COVID-19 in the New York City area. *Jama*. 2020.
15. Pal R, Bhansali A. COVID-19, diabetes mellitus and ACE2: the conundrum. *diabetes research and clinical practice*. 2020;**162**.