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Covid-19 and Obesity: Case Report

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ABSTRACT

Background: COVID-19 is a viral disease that has high transmissibility and can cause acute respiratory distress and progress to the failure of several organs.

Case presentation: In this case report, we present the multifaceted scope of COVID-19, which affected a young adult patient, presenting grade II obesity as the only comorbidity. The case data indicate a relationship between comorbidity and the disease, including its prognosis and length of hospital stay. The COVID-19 infection behaved persistently. Obesity, as the only detected comorbidity, appeared to be a contributor to delayed recovery and discharge.

Conclusion: It is important to report cases about the new coronavirus so that the medical community can explore and deepen the experiences surrounding this disease. Future studies should point to concrete evidence regarding the relationship between obesity and COVID-19.

KEYWORDS: COVID-19; Obesity; Prognostic

INTRODUCTION

COVID-19 is a viral disease that has high transmissibility and can cause acute respiratory distress and progress to the failure of several organs [1]. Its lethality may vary according to the age group and associated clinical conditions [2]. Obesity, as an associated comorbidity, has been studied by researchers in relation to COVID-19, as there are similar pathophysiological evidences between obesity and COVID-19, such as decreased expiratory reserve, functional capacity, respiratory system compliance, diaphragmatic excursion and

the increase in inflammatory cytokines, which can contribute to the disease morbidity [3]. We present the case of a 51 years old man admitted to a public hospital of reference for severe cases of COVID-19 in the Northeast of Brazil, with a prognosis of severity and self-reported comorbidity of grade II obesity.

CASE PRESENTATION

A 51-years-old male patient had a dry cough on April 21, 2020; initiated treatment with Azithromycin 600 mg every 12 hours and Prednisone 20 mg for five days; on the third day of the disease, it remained saturated at 94% and had a fever (38ºC) yielding with 500 mg Dipyrone; on the fifth day of treatment the fever returned, he felt a dynamic and tired when making small efforts; sought an Emergency Care Unit, where he received a medical diagnosis of COVID-19 based on signs and symptoms; started using Oseltamivir phosphate 75 mg and performed the Swab test, positive 15 days after the first symptoms. From the eighth to the tenth day of the disease, saturation dropped from 94% to 88%. On the 10th day, he underwent a Computed Tomography scan that showed involvement of more than 75% of the lungs. On the following day (11th day of illness), he was admitted to a Reference Hospital for patients with severe COVID-19, where he was accompanied by a multidisciplinary team, being discharged on May 9,

The detection of COVID-19 was diagnosed by means of signs and symptoms presented and confirmed by the positive result of the SARS-CoV-2 ORF1ab gene by collection with nasopharyngeal Swab, collected on the fifth day of the presence of fever and cough. Computed Tomography showed multiple opacities with a predominant attenuation of "ground glass" distributed in the upper and lower fields of both lungs, especially in the basal peripheries, with thickening of the interlobular septa in between ("mosaic pavement"), consolidation areas and bands of pulmonary architectural distortion. These changes affect more than 75% of the total lung area under virtual analysis (Figure 1). Regarding clinical manifestations, the patient had BMI = 36.1 grade II obesity; there was an exacerbation of signs and symptoms in the first three days of hospitalization: fever - 38.0ºC, 38.2ºC and 38.3ºC; MBP 88.5 mmHg, 85 mmHg and 95 mmHg; PO^2 and CO^2 remained at 36%; FC-76 bpm, 92bpm, 86bpm; FR - 24mrm, 19mrm, 16mrm; Sat O2 - 95%, 94%, 95% with oxygen support per catheter at 1 L/min. Laboratory tests showed an inflammatory process more exacerbated during the first three days of hospitalization: Hemoglobin (HB) - 15.6g/Dl, 15.7g/Dl and 14.9g/Dl; Hematocrit (HT) - 45.6%, 45.0% and 45.0%; Leukocytes (Leuco) - 4,700 mm^3, 6,420 mm^3 and 6,940 mm^3; however, DHL - 865U/L, 499U/L, 562U/L; CRP - 35mg/dl, 95 mg/dl, 136 mg/dl; and Lymphocytopenia – 564 mm^3, 661 mm^3 and 690 mm^3, respectively. After the hospitalization period, there was an improvement in HB laboratory tests - 15.1g/Dl; HT - 47.6%; Leuco – 8,629 mm^3; DHL - 375U/L; CRP - 1.56 mg/dl and Lymphocytes – 1,555 mm^3.

DISCUSSION

During the COVID-19 pandemic, several factors were associated with the disease due to the pathophysiological ignorance of the viral infection, which sought to selectively deepen a new global disease, addressing the clinical findings of signs and symptoms, stratifying the severity of the disease and classifying the people asymptomatic and symptomatic, carriers of the mildest, most serious and very serious disease that require hospitalization and fatal cases [4,5]. The tests for the disease in suspected cases are very limited due to the small amount to test the entire population. The most appropriate test at the moment is the RT-PCR that detects the nucleic acid positive for SARS-COV-2 in the sputum, throat and secretions of the lower respiratory tract, using SWAB [6]. The Computed Tomography of patients with COVID-19 also presents typical characteristics that can be useful in the early screening of suspected cases while awaiting confirmatory exams, showing the extent of the lesion and the most severe cases of the disease. In a recent study with 101 cases of COVID-19 pneumonia performed at four health institutions in Hunan, China, ground glass opacities were observed in 87.1% (n = 87) of the cases and consolidation in 64.4% (n = 65); in addition, vascular impairment of the lungs was observed in 74.3% (n = 72) and traction bronchiectasis in 52.5% (n = 53) of the patients. The evidence showed peripheral distribution of the lesions, bilateral involvement with an inferior predominance and multifocal [7]. In this study it was observed the persistence of fever, cough, myalgia and physical tiredness with small efforts. These symptoms have been evidenced in several studies [8-10], but some symptoms such as anosmia and dysgeusia have been little reported [11]. The most severe pathophysiological mechanisms of COVID-19 were observed in the elderly and patients with comorbidities, such as cardiovascular diseases, diabetes, hypertension, chronic kidney disease and cancer [12]. Studies also show that patients with obesity and high BMI have some epidemiological link with the serious effects of the disease, probably due to the low-grade inflammatory state [13] that they are prone to previously by the release of cytokines - TNFα, IL-1, IL-6 - secreted by adipose tissue [14].

CONCLUSION

In this case report, the COVID-19 infection behaved persistently. Obesity, as the only detected comorbidity, appeared to be a contributor to delayed recovery and discharge. It was noticed that, both in obesity, as in COVID-19, inflammatory processes are common and evidenced by the same markers; these processes can exacerbate the infection caused by SARS-CoV-2. Due to the growing volume of research related to the pandemic, future studies should point to concrete evidence regarding the relationship between obesity and COVID-19

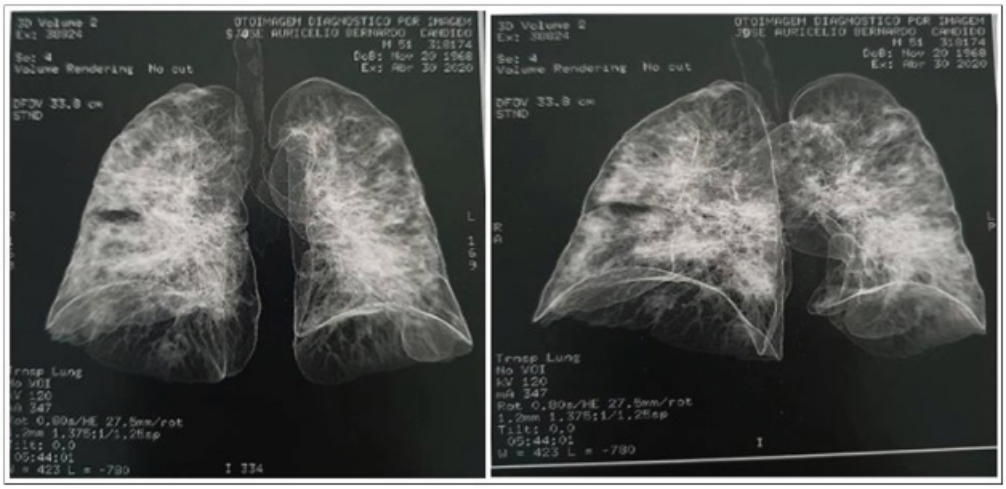

Figure 1: Computed Tomography image in frosted glass pattern. Fortaleza, Ceará, Brazil, 2020

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