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Clinical profile of patients with obesity and COVID-19 in an outpatient setting in northeastern Brazil: a retrospective cohort study

Perfil clínico de pacientes com obesidade e COVID-19 em ambiente ambulatorial no nordeste do Brasil: um estudo de coorte retrospectivo

Perfil clínico de los pacientes con obesidad y COVID-19 en el ámbito ambulatorio del noreste de Brasil: un estudio de cohorte retrospective

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Abstract

Objective: To analyze the clinical profile of obese patients with COVID-19 in ambulatory care during the first wave of the pandemic. Methods: A retrospective observational study conducted in an outpatient setting in Aracaju/SE, Brazil. The patients with COVID-19 received medical care in a referral center from April to August 2020 and were followed remotely. Clinical data was analyzed using Jamovi 1.2.27. Results: Of 1,134 patients with COVID-19, 288 (25.4%) were obese, 59.7% were women. Hypertension, diabetes, dyslipidemia, and chronic kidney disease were more frequent in the obese group. Dyspnea and diarrhea were more frequent in obese individuals, while odynophagia, nausea, and vomiting were more common in non-obese individuals. Attending physicians prescribed more antibiotics, ivermectin, corticosteroids, and heparin for obese patients. Hospital admission (6.6% vs. 3.1%; p=0.008) and use of oxygen therapy (5.1% vs. 2.1%; p=0.011) were more frequent in the obesity group. Obesity was independently

associated with hospital admission in multivariate analysis (OR: 2.561, 95% CI 1.352 - 4.853; p=0.004). The lethality rate was higher in obese individuals (2.1% vs. 0.7%; p=0.049). Conclusion: In this outpatient cohort of COVID-19 patients, there were more comorbidities among obese individuals. Despite the low frequency of unfavorable outcomes overall, obesity increased the risk of hospital admission and there were more deaths among patients with obesity.
Keywords: Ambulatory care; COVID-19; Obesity; Pandemic; Risk factors.

Resumo

Objetivo: Analisar o perfil clínico dos pacientes obesos com COVID-19 em assistência ambulatorial durante a primeira onda da pandemia. Métodos: Estudo observacional retrospectivo, realizado em ambiente ambulatorial de Aracaju/SE, Brasil. Os pacientes com COVID-19 receberam atendimento médico em centro de referência de abril a agosto de 2020 e foram seguidos remotamente. Os dados clínicos deles foram analisados pelo programa Jamovi 1.2.27. Resultados: De 1.134 pacientes com COVID-19, 288 (25,4%) eram obesos, 59,7% eram mulheres. Hipertensão, diabetes, dislipidemia, e doença renal crônica foram mais frequentes no grupo de obesos. Dispneia e diarreia foram mais frequentes em indivíduos obesos, enquanto odinofagia, náusea e vômito foram mais comuns em não obesos. Médicos assistentes receitaram mais antibióticos, ivermectina, corticosteroides e heparina para pacientes obesos. A admissão hospitalar (6,6% vs. 3,1%; p=0,008) e o uso de oxigenoterapia (5,1% vs. 2,1%; p=0,011) foram mais frequentes no grupo da obesidade. A obesidade foi associada independentemente à admissão hospitalar em análise multivariada (OR: 2.561, IC 95% 1.352 - 4.853; p=0.004). A taxa de letalidade foi maior em indivíduos obesos (2,1% vs. 0,7%; p=0,049). Conclusão: Nesta coorte ambulatorial de pacientes com COVID-19, houve mais comorbidades entre indivíduos com obesidade. Apesar da baixa freqüência de resultados desfavoráveis em geral, a obesidade aumentou o risco de internação hospitalar e houve mais mortes entre os pacientes com obesidade.
Palavras-chave: Assistência ambulatorial; COVID-19; Obesidade; Pandemia; Fator de risco.

Resumen

Objetivo: Analizar el perfil clínico de los pacientes obesos con COVID-19 en atención ambulatoria durante la primera ola de la pandemia. Métodos: Estudio observacional retrospectivo realizado en un entorno ambulatorio en Aracaju/SE, Brasil. Los pacientes con COVID-19 recibieron atención médica en un centro de referencia de abril a agosto de 2020 y fueron seguidos a distancia. Sus datos clínicos se analizaron con el programa Jamovi 1.2.27. Resultados: De 1.134 pacientes con COVID-19, 288 (25,4%) eran obesos y el 59,7% eran mujeres. La hipertensión, la diabetes, la dislipidemia y la enfermedad renal crónica eran más frecuentes en el grupo obeso. La disnea y la diarrea fueron más frecuentes en los individuos obesos, mientras que la odinofagia, las náuseas y los vómitos fueron más comunes en los individuos no obesos. Los médicos asistentes recetaron más antibióticos, ivermectina, corticoides y heparina a los pacientes obesos. El ingreso hospitalario (6,6% frente a 3,1%; p=0,008) y el uso de oxigenoterapia (5,1% frente a 2,1%; p=0,011) fueron más frecuentes en el grupo de obesidad. La obesidad se asoció de forma independiente con el ingreso hospitalario en el análisis multivariante (OR: 2,561; IC del 95%: 1,352 - 4,853; p=0,004). La tasa de letalidad fue mayor en los individuos obesos (2,1% frente al 0,7%; p=0,049). Conclusión: En esta cohorte de pacientes ambulatorios de COVID-19, hubo más comorbilidades entre los individuos con obesidad. A pesar de la baja frecuencia de resultados desfavorables en general, la obesidad aumentó el riesgo de ingreso hospitalario y hubo más muertes entre los pacientes con obesidad.
Palabras clave: Atención ambulatoria; COVID-19; Obesidad; Pandemia; Factor de riesgo.

1. Introduction

The COVID-19 pandemic has revealed obesity as a major risk factor for unfavorable outcomes, including in young patients without other comorbidities (Lighter et al. 2020; Kass et al. 2020; Zhou et al. 2020). Obesity not only is involved with other diseases that are also risk factors, such as diabetes and hypertension, but also appeared as an independent factor for worse COVID-19 outcomes (Zhou et al. 2020; Docherty et al. 2020; Finer et al. 2020; Stefan et al. 2020).

Several pathophysiological hypotheses have been raised, such as altered lung physiology leading to hypoventilation syndrome (Stefan et al. 2020; Akoumianakis & Filippatos 2020; Ryan et al. 2020), chronic inflammation state – including high levels of IL-6, acute-phase serum amyloid protein A, TNF-alpha, IL-1, IL-8, IL-10 and IFN-gamma (Zhou et al. 2020; Akoumianakis & Filippatos 2020; Ryan et al. 2020; Petrakis et al. 2020) –, leptin resistance or decreased T and B-cell activity (Zhou et al. 2020; Mattioli et al. 2020). Moreover, since ACE2 receptor is present in the adipose tissue, this might be a reservoir for SARS-CoV2 (Zhou et al. 2020; Akoumianakis & Filippatos 2020; Petrakis et al. 2020).

Clinical studies in hospital settings have indicated worse outcomes among patients with obesity admitted with COVID-19, including higher lethality (Hussain et al, 2020; Poly et al. 2021; Chu et al. 2020; Yang et al. 2020; Palaiodimos et

al. 2020; Williamson et al. 2020), but there are fewer data regarding out-of-hospital settings. Since this was a recent global disease outbreak with regional heterogeneity, is it important to characterize all the settings in different regions.

With this in mind, this study aimed to assess the clinical profile of ambulatory patients with obesity and COVID-19 followed remotely in an outpatient setting during the first wave of the pandemic in Northeastern Brazil.

2. Methodology

Study design, sample and setting

We conducted a conventional retrospective observational cohort study, which follows a population over time, collecting past information on exposure factors and seeking an association between exposure and outcome (Camargo et al. 2019; Fontelles et al. 2009), of 1936 consecutive cases of with flu symptoms assisted during the first COVID-19 outbreak, between April and August 2020, in an ambulatory care center at the Respiratory Diseases Center of a service linked to a public servant assistance agency in Aracaju, SE, Brazil. This center provided outpatient care, symptomatic subjects spontaneously sought this facility and were consecutively enrolled in a remote monitoring system organized by an emergency extension program of the Federal University of Sergipe. These patients were daily checked by supervised medical students through phone calls and were followed until the fourteenth day from the outbreak or an outcome.

The Respiratory Disease Center decided not to enroll asymptomatic patients in the remote follow up, and patients who denied this telehealth care were also excluded. Case management in this health center was independently determined by the attending physicians according to their local protocol. Clinical data was registered by the extension program team in a digital platform called “Monitora Corona”, and we revised these charts afterward.

We considered confirmed cases of COVID-19 those with suggestive symptoms during the face-to-face medical assessment associated with either a positive RT-PCR for SARS-CoV-2, a positive serology test or a typical chest CT (Dias et al. 2020), with peripheral, bilateral, rounded, or multifocal ground-glass opacities with or without consolidations (Rosa et al. 2020). At the time, local protocol advised RT-PCR until the seventh day of symptoms, and serology after that. Of the 1936 flu-like cases, 1134 were confirmed with COVID-19 and included in our analysis.

Variables and data analysis

The retrospective chart review (Camargo et al. 2019) included clinical characteristics, such as age, gender, prior self-reported comorbidities and current acute symptoms. Medications prescribed by assistant physicians according to local protocol for COVID-19 were also reviewed. Body mass index (BMI) was calculated according to self-reported weight and height, and obesity was defined as BMI $\geq$ 30 kg/m² (World Health Organization technical report series, 1995). This protocol was delineated by the medical staff from the health center during the first wave of the pandemic. At that time, even though there were no randomized trial results, concerns regarding the use of hydroxychloroquine had already emerged, so this drug was nearly not used by them. On the other hand, the protocol supported widespread use of ivermectin, antibiotics, corticosteroids in ambulatory patients and heparin. Outcomes were informed during phone calls in the remote follow up and included need for hospital admission, ICU admission, oxygen therapy, mechanical ventilation and death.

Ethics and funding

This study was approved by the Research Ethics Committee of the Tiradentes University (UNIT), under protocol no. 37304520.7.0000.5371, on April 12, 2021. The privacy of all participants was respected, and their identities were kept confidential. The researchers involved did not contact the patients, and the analysis was limited to the evaluation of documents in the medical records. Thus, there was no need for a free and informed consent statement.

The present study did not receive private funding, but was encouraged by the federal government through a CNPq scientific initiation scholarship.

Statistical analysis

The data were processed using Jamovi 1.2.27 (R Core Team, 2018). Two-tailed p values were used, and values < 0.05 were considered statistically significant. Categorical variables were presented as absolute and relative frequencies. Differences were evaluated by Pearson's chi-square test and Fisher's exact test, when appropriate. Continuous variables were presented as mean ± standard deviation values, and differences between subgroups were assessed through Student's T test, for normal distributions, or Mann-Whitney U test for non-normal distributions. For multivariate analysis, a logistic regression model was used, in which variables with $p < 0.1$ were included in univariate analysis. Multicollinearity problem was solved before inserting variables in the model. A backward variable selection method was used, and variables that remained in the model were tested for possible interactions.

3. Results

A total of 1936 patients with flu-like symptoms enrolled for remote monitoring, and 1134 of them were confirmed cases of COVID-19 included in our analysis. There were 62.3% of females, mean age was 44.6 ± 12.1 years and 288 (25.4%) patients had obesity. When subgroups were compared, patients with obesity were older and their symptoms lasted longer (Table 1).

Table 1 – Clinical characteristics of ambulatory patients with COVID-19 according to weight status.

Variable	Obesity N (%)	Non-obesity N (%)	p
Female	172 (59.7%)	527 (62.3%)	0.438
Age (years)	47.5 ± 10.3	43.6 ± 12.6	< 0.001
Health professionals	77 (26.7%)	201 (23.8%)	0.310
Mean duration of COVID-19 symptoms (days)	8.1	6.9	0.383

Source: Authors.

COVID-19 was confirmed by a positive RT-PCR in 85.4% of subjects with obesity, while 63.3% of those who had a chest CT presented typical findings of this infection.

Regarding comorbidities, hypertension, diabetes, chronic kidney disease and dyslipidemia were associated with obesity. There was no difference between groups considering smoking and chronic pulmonary disease (Table 2).

Table 2 – Comorbidities of ambulatory patients with COVID-19 according to weight status.

Variable	Obesity N (%)	Non-obesity N (%)	p
Hypertension	131 (45.5%)	191 (22.6%)	< 0.001
Diabetes	45 (15.6%)	57 (6.4%)	< 0.001
Prior myocardial infarction	2 (0.7%)	11 (1.3%)	0.404
Chronic obstructive pulmonary disease	1 (0.3%)	6 (0.7%)	0.498
Chronic kidney disease	3 (1%)	1 (0.1%)	0.022
Asthma	13 (4.5%)	29 (3.4%)	0.399
Smoking	6 (2.1%)	12 (1.4%)	0.436
Active malignancy	2 (0.7%)	2 (0.2%)	0.257
Alcoholism	60 (20.8%)	141 (16.7%)	0.110
Dyslipidemia	44 (15.3%)	82 (9.7%)	0.009
Psychiatric disorders	21 (7.3%)	63 (7.4%)	0.931

Source: Authors.

The most frequent symptoms in the whole group were headache, dry cough and asthenia. Patients with obesity presented more often with dyspnea and diarrhea, whereas non-obese subjects with odynophagia, nausea and vomiting (Table 3).

Table 3 - Clinical manifestations of COVID-19 in ambulatory patients according to weight status.

Variable	Obesity N (%)	Non-obesity N (%)	p
Nausea/vomiting	65 (22.6%)	243 (28.7%)	0.043
Dry cough	204 (70.8%)	550 (65%)	0.071
Productive cough	54 (18.8%)	118 (13.9%)	0.05
Dyspnea	112 (38.9%)	268 (31.7%)	0.025
Fever	138 (47.9%)	374 (44.2%)	0.275
Odynophagia	104 (36.1%)	365 (43.1%)	0.036
Dysgeusia	172 (59.7%)	464 (54.8%)	0.362
Anosmia	152 (52.8%)	435 (51.4%)	0.69
Diarrhea	146 (50.7%)	341 (40.3%)	0.002
Abdominal pain	85 (29.5%)	230 (27.2%)	0.446
Hyporexia	98 (34%)	332 (39.2%)	0.115
Myalgia	166 (57.6%)	482 (57%)	0.844
Asthenia	185 (64.2%)	526 (62.2%)	0.532
Headache	230 (79.9%)	657 (77.7%)	0.434
Sneezing/runny nose	134 (46.5%)	422 (49.9%)	0.325
Dizziness	53 (18.4%)	163 (19.3%)	0.747
Mental confusion	5 (1.7%)	20 (2.4%)	0.531
Skin lesions	23 (8%)	58 (6.9%)	0.52

Source: Authors.

Antibiotics and ivermectin were frequently prescribed for both groups. The most used antibiotics were azithromycin, levofloxacin and amoxicillin clavulanate. However, all of the medications indicated by their local protocol at the time were prescribed more often to subjects with obesity (Table 4).

Table 4 – Treatment for COVID-19 prescribed to ambulatory patients according to weight status.

Variable	Obesity N (%)	Non-obesity N (%)	p
Oral antibiotic	222 (77.1%)	590 (69.7%)	0.017
Ivermectin	195 (67.7%)	491 (58%)	0.004
Oral corticosteroid	120 (41.7%)	297 (35.1%)	0.046
Heparin	55 (19.1%)	89 (10.5%)	< 0.001

Source: Authors.

Need for hospital admission and oxygen therapy were the most frequent clinical outcomes among patients with COVID-19 and obesity. Disease duration and length of hospital stay were similar in both groups. Obesity was independently associated with need for hospital admission in multivariate analysis (OR: 2.56, CI95% 1.35-4,85; p=0.004), and lethality rate was higher in the obesity group (2.1% vs. 0.7%; p = 0.049) (Table 5).

Table 5 – Clinical outcomes of ambulatory patients with COVID-19 according to weight status.

Variable	Obesity N (%)	Non-obesity N (%)	p
Hospital admission	19 (6.6%)	26 (3.1%)	0.008
ICU admission	3 (1.1%)	8 (1%)	0.896
Oxygen therapy	14 (5.1%)	17 (2.1%)	0.011
Mechanical ventilation	1 (0.4%)	5 (0.6%)	0.62
Death	6 (2.1%)	6 (0.7%)	0.049

Source: Authors.

4. Discussion

In our retrospective study of an out-of-hospital cohort of patient with COVID-19 during the first wave of the pandemic in Brazil, more than half of the subjects were female, 25.4% had obesity and mean age was approximately 44 years-old. Patients with obesity had a 46% higher risk of getting infected by SARS-CoV-2 (Popkin et al. 2020), and even though data are not consistent regarding gender, there were more women in the obese group with COVID-19 (Al Heialy et al. 2021), just as women with obesity may have a higher risk of death from COVID-19 (Peters et al. 2021).

Obesity is associated with other chronic diseases that also contribute to worse outcomes of COVID-19. Comorbidities were common in patients admitted with COVID-19 and were present in 55% of cases of class 1 obesity, 78% of class 2, 72% of class 3, 49% of overweight and in 40% of normal weight individuals with COVID-19 (Al Heialy et al. 2021). Hypertension (56.6%), obesity (41.7%) and diabetes (33.8%) were more frequently observed among patients admitted to hospital with COVID-19 than in our cohort (Richardson et al. 2020). On the other hand, when hospitalized patients with obesity were analyzed, frequency of hypertension varied from numbers close to ours (35% in class 1 obesity, 44% in classes 2 and 3, 23% in non-obese) (Al Heialy et al. 2021), to 71.7% in class 2 obesity in another study (Palaiodimos et al. 2020).

Diabetes, one of the main comorbidities related to obesity, has been described as an independent risk factor for worse COVID-19 outcomes, leading to admission rates 3.1 times higher in patients with diabetes (Zhou et al. 2020). Even though diabetes frequency in our out-of-hospital cohort (9%) was similar to general prevalence, there were more cases of diabetes among the obesity group (15.6%). Moreover, in hospitalized patients with COVID-19, diabetes was more frequent in both obese and normal weight subjects and achieved 32% (Al Heialy et al. 2021). Dyslipidemia was also more frequently found among patients with obesity in our study, but in a hospital setting this frequency was over 40% in all BMI categories (Palaiodimos et al. 2020). Cardiovascular disease was infrequent and similar between the groups in our cohort, as was also found by other studies (Palaiodimos et al. 2020; Al Heialy et al. 2021).

There was no difference regarding previous pulmonary diseases when groups with and without obesity were compared in both our cohort and in another from the United States (Palaiodimos et al. 2020), while a Saudi study that found more lung disease in class 3 obesity had a limited number of such cases (Al Heialy et al. 2021). Active malignancy was

uncommon in our group and also in studies including hospitalized patients with COVID-19 and obesity (Palaiodimos et al. 2020; Al Heialy et al. 2021), possibly due to the fact that these were not reference centers for cancer patients and these subjects might have adhered more to social distancing during the first wave. Despite the association with obesity, chronic kidney disease was rare in our cohort, while in hospital settings renal dysfunction was more common, but without differences regarding BMI (Palaiodimos et al. 2020).

Our cohort had few smokers (1.6%), and this frequency varies among studies with hospitalized patients, ranging from 6.5% to over 30%, but without differences when groups were compared by BMI (Palaiodimos et al. 2020; Kashyap et al. 2020). On the other hand, 17.7% of our cohort had alcoholism and, although there was an assumption that the combination of alcohol and obesity could aggravate COVID-19 inflammation (Bilal et al. 2020), we did not observe any difference between groups regarding this aspect.

Fever, cough, dyspnea and asthenia were the most frequent symptoms among patients admitted with COVID-19, while hemoptysis, headache and diarrhea were the most rare (Palaiodimos et al. 2020; Sun et al. 2020; Wang et al. 2020). In our out-of-hospital cohort, less than half had fever, and the most frequently found symptoms in general were headache, dry cough, asthenia, myalgia, anosmia and dysgeusia, while the most uncommon were altered mental status and skin lesions. Even though some symptoms were more frequent in the obesity group, there was no clear clinically relevant difference between groups in our study, like an American cohort of hospitalized patients that observed indistinct clinical manifestations of COVID-19 when compared obese and non-obese subjects (Palaiodimos et al. 2020).

Since this was a retrospective cohort, drug prescription was independently indicated by the assistant physicians according to their local institutional protocol at the time. Despite the high frequency of unproved COVID-19 treatments prescription in both groups, it was even more common among patients with obesity, possibly because during the first wave of the pandemic obesity had already been described as a relevant risk factor for unfavorable outcomes. However, we emphasize that these drugs prescribed for these patients either had not proven to be effective or should be used only in a hospital setting (Popp et al. 2021; Berger & Connors, 2021; Moores et al. 2020; Piazza & Morrow, 2020; The Recovery Group, 2020; Ministério da Saúde Brasil, 2021).

Antibiotics had been widely used for COVID-19, including in our cohort, but a metanalysis showed that bacterial co-infection is infrequent in COVID-19 and occurred in 6.9% of cases, while over 70% of such patients received antibiotics (Langford et al. 2020). Aside from that, azithromycin, one of the most prescribed antibiotics during the pandemic, has no effect on COVID-19 infections (Rosenberg et al. 2020). On the other hand, an unicentric study with critically ill patients with COVID-19 found bacterial and fungal infections in 40.7% of cases, and over 80% had received azithromycin or ceftriaxone on admission (Bardi et al. 2021). Still in the ICU setting, COVID-19 increased the risk of bloodstream infections seven days post-admission (Buetti et al. 2021).

Although oral corticosteroids were frequently prescribed for patients in this out-of-hospital cohort, the Recovery trial only proved the benefits of dexamethasone for hospitalized patients with oxygen therapy or in mechanical ventilation (The Recovery Group, 2020). Similarly, heparin was prescribed for over 10% of these ambulatory patients, but there is no evidence of benefit in this context, in spite of the higher risk of thromboembolic events in patients with COVID-19 (Berger & Connors, 2021; Piazza et al. 2020). Current recommendation is prophylactic use of heparin only in hospitalized patients (Moores et al. 2020; Piazza & Morrow, 2020; Ministério da Saúde Brasil, 2021).

Cohorts of hospitalized patients with COVID-19 had demonstrated higher rates of unfavorable outcomes among subjects with obesity (Docherty et al. 2020; Hussain et al. 2020; Palaiodimos et al. 2020; Sharma et al. 2020; Simonnet et al. 2020), and this out-of-hospital cohort also observed such findings, but in a lower rate as expected. Need for hospital admission in patients with obesity in this cohort was 6.6%, more than double when compared to non-obese patients, and obesity increased

the risk of admission in 2,5 times. Likewise, an unicentric American study with over 5000 patients with COVID-19 showed the same increase in risk for hospital admission for obese patients (Petrilli et al. 2020). On top of that, obesity also increased the risk for hospital admission in patients with COVID-19 under 60 years of age (Lighter et al. 2020).

Despite the low frequency of need for ICU admission in our ambulatory cohort, two metanalyses indicated higher risk of ICU admission among patients with obesity and COVID-19 (Chu et al. 2020; Yang et al. 2020). It is hypothesized that worse ventilatory outcomes are more common among patients with obesity and COVID-19 due to a reduced respiratory muscle strength and decreased pulmonary compliance caused by fat accumulation over the ribs, in the diaphragm and in the abdomen, leading to higher energy expenditure for ventilation, and as a result the respiratory system in obese subjects would be more susceptible to damage (Albashir, 2020).

Even though there was low need for oxygen therapy in our cohort, it was more frequent among the obesity group, while in an American cohort with hospitalized patients with COVID-19, subjects with BMI ≥ 35kg/m² were 3.1 times more likely to use supplemental oxygen (Palaiodimos et al. 2020). The need for mechanical ventilation, for its turn, was low in both groups in our study, but in hospitalized cohorts there was a risk 4.0 to 7.3 times higher of mechanical ventilation when BMI ≥ 35kg/m² (Chu et al. 2020; Yang et al. 2020; Palaiodimos et al. 2020; Petrilli et al. 2020). It is important to highlight that obesity might also relate to difficult airway, sleep apnea and other aspects that might impair invasive mechanic ventilation (Albashir, 2020; Földi et al. 2020). On the other hand, studies with ICU patients with other diseases than COVID-19 did not show worse outcomes in obese subjects (Hongue et al. 2009; O'Brien et al. 2006).

In this outpatient cohort, there were more deaths among patients with obesity (2.1% vs. 0.7%; p=0.049). Although there are discordant findings, most studies have described higher mortality in obese patients with COVID-19 (Hussain et al. 2020; Poly et al. 2021; Chu et al. 2020; Yang et al. 2020; Palaiodimos et al. 2020), and a recent metanalysis showed a risk of death 92%, 56% and 27% higher in class 3, 2 and 1 obesity, respectively (Poly et al. 2021). In a hospital cohort, COVID-19 was 3.8 times more lethal in patients with BMI ≥ 35kg/m² (Palaiodimos et al. 2020), while the OpenSAFELY research platform demonstrated during the first wave of the pandemic that class 2 and 3 obesity increased the risk of death in 40% and 92%, respectively (Williamson et al. 2020).

This study presents a selection bias, since asymptomatic patients were not enrolled in the remote monitoring system. Besides, this observational retrospective cohort was a convenience sample, and information was mostly obtained by phone calls during the first wave of the COVID-19 pandemic, so laboratory tests and physical exam were limited and follow-up was short.

5. Conclusion

In this outpatient cohort during the first wave of COVID-19, there more comorbidities among subjects with obesity, but there was no clinically significant difference regarding clinical manifestations. Even though dyspnea was more frequent in obese patients, constitutional symptoms, dry cough, dysgeusia e anosmia were common in both groups. Obesity was probably a bias that influenced assistant physicians to prescribe more often drugs with lack of effectiveness for COVID-19. Despite the low frequency of unfavorable outcomes in general, obesity increased the risk of hospital admission and there were more deaths among patients with obesity.

For future research, we suggest re-evaluating individuals at later times of COVID-19 infection, analyzing persistent symptoms and the clinical profile of these patients. In addition, we propose to analyze new cases in vaccinated and unvaccinated populations, either fully or not.

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