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Mortality of obese patients affected by covid-19 in the state of paraíba: a descriptive analysis

Mortalidade de pacientes obesos acometidos por covid-19 no estado da paraíba: uma análise descritiva

Mortalidad de pacientes obesos afectados por covid-19 en el estado de paraíba: un análisis descriptivo

RESUMO

Objetivo: Descrever e quantificar os dados fornecidos pelo governo do estado da Paraíba em relação à mortalidade de pacientes obesos acometidos por COVID-19 no Estado. **Método:** Foi realizado um estudo descritivo e quantitativo com base nas informações epidemiológicas da mortalidade de pacientes obesos acometidos com COVID-19 no estado da Paraíba, utilizando as variáveis: Data do óbito, sexo, idade, método de diagnóstico, início dos sintomas, município de residência e doença preexistente. **Resultados:** A maioria dos óbitos se concentra no ano de 2021, em notoriedade em Março com 149 óbitos, predominância do sexo feminino, as idades mais atingidas foram 61 e 68 anos, confirmação da infecção em sua maioria por teste de Swab, 155 pacientes iniciaram sintomas em Março de 2021, 102 municípios paraibanos foram identificados, além da obesidade dose doenças preexistentes foram constatadas. **Conclusão:** O estudo demonstrou a obesidade como fator relevante na mortalidade por COVID-19 na Paraíba.

DESCRIPTORES: Infecções por Coronavírus; Obesidade; Mortalidade.

ABSTRACT

Objective: To describe and quantify the data provided by the government of the state of Paraíba in relation to the mortality of obese patients affected by COVID-19 in the state. **Method:** A descriptive and quantitative study was carried out based on epidemiological information on the mortality of obese patients affected with COVID-19 in the state of Paraíba, using the variables: date of death, sex, age, method of diagnosis, onset of symptoms, municipality of residence and pre-existing illness. **Results:** Most deaths are concentrated in the year 2021, in notoriety in March with 149 deaths, predominantly female, the most affected ages were 61 and 68 years, confirmation of infection mostly by Swab test, 155 patients started symptoms in March/2021, 102 municipalities in Paraíba. were identified, in addition to obesity and preexisting diseases were found. **Conclusion:** The study demonstrated obesity as a relevant factor in mortality from COVID-19 in Paraíba.

DESCRIPTORS: Coronavirus Infections; Obesity; Mortality.

RESUMEN

Objetivo: Describir y cuantificar los datos proporcionados por el gobierno del estado de Paraíba en relación a la mortalidad de pacientes obesos afectados por COVID-19 en el estado. **Método:** Se realizó un estudio descriptivo y cuantitativo con base en información epidemiológica sobre la mortalidad de pacientes obesos afectados por COVID-19 en el estado de Paraíba, utilizando las variables: fecha de fallecimiento, sexo, edad, método de diagnóstico, inicio de síntomas., municipio de residencia y enfermedad preexistente. **Resultados:** La mayoría de las muertes se concentran en el año 2021, en notoriedad en marzo con 149 muertes, predominantemente mujeres, las edades más afectadas fueron 61 y 68 años, confirmación de infección mayoritariamente por prueba Swab, 155 pacientes iniciaron síntomas en marzo / 2021, 102 Se identificaron municipios de Paraíba, además de obesidad y enfermedades preexistentes. **Conclusión:** El estudio demostró que la obesidad es un factor relevante en la mortalidad por COVID-19 en Paraíba.

DESCRIPTORES: Infecciones por coronavirus; Obesidad; Mortalidad.

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INTRODUCTION

The World Health Organization – WHO defines obesity as a pathology determined by the abnormal or excessive accumulation of fat in the body, which is a result of the chronic imbalance between food consumption and caloric expenditure, causing loss of quality of life and reduced longevity. 1 Obesity is a permanent disorder throughout the world. Given the population's increasingly high sedentary lifestyle, excess adipose tissue has become increasingly constant in society. The WHO considers the Body Mass Index-BMI for the diagnosis of the nutritional status of adults equal to or greater than 30 kg/m² as obesity, performed by dividing the patient's total weight, measured in kilograms, by the squared height, measured in meters (kg/m²). 2

On the other hand, in addition to mortality from obesity being statistically proven and evidenced, since the end of 2019 we have carried the new pandemic of coronavirus infection that is leading public health to evidence in the world. The variant of this disease appeared in Wuhan, China, at the end of the year 2019, it is classified as a Betacoronavirus belonging to the SARS virus. In this follow-up, after contamination, clinical evidence can range from an absence of symptoms to severe acute respiratory infection. 3 This infection requires hospitalization and oxygen support, in addition to the use of assisted ventilation in intensive care units, whether it is invasive mechanical ventilation or not. Thus, the presence of comorbidities, such as obesity, is considered a risk factor for the disease, which may increase the prognosis and increase the probability of death. 4

There is a hegemony of obesity around the world, numbers that tripled between

1975 and 2016, statistical calculations indicate that more than 2 billion people face exaggerated body weight, as well as pointing to the trend of growth in these rates until 2030, commonly indicated in the literature as a reason for increased mortality, with a reduced life expectancy between 5 and 20 years, also triggering other comorbidities that also cause a greater severity of patients affected with COVID-19 such as diabetes mellitus type 2, cardiovascular diseases, kidney diseases. In addition, obese patients are at increased risk for developing pneumonia and other viral respiratory tract infections. 5

In the Paraíba coronavirus panel, obesity ranks fourth in the proportionality of confirmed deaths according to comorbidity and risk factors, with 9,09% being only behind hypertension, which leads the ranking with 23,80%, in second heart disease with 22,42%, and third diabetes mellitus, ahead of respiratory diseases with only 4,25%, where they generally have greater visibility in the correlation of severe comorbidity for COVID-19. 6

Thus, this study aimed to describe and quantify the data provided by the government of the state of Paraíba in relation to the mortality of obese patients affected by COVID-19 in the state.

METHOD

A descriptive and quantitative study was carried out based on epidemiological information on the mortality of patients who were affected with COVID-19, who had obesity as a preexisting disease. Data were obtained from the electronic platform made available openly by the government of the state of Paraíba through <http://su-perset.plataformatarget>.

As inclusion criteria, we used all data located by searching the microdata contained on the site, filtered through the use of the word obesity in the option to search the site itself, which is described in English as 'search'. Exclusion criteria were mortality data that did not present obesity as a preexisting disease, as well as those that were outside the established research period. Data were collected on May 17th, 2021, and comprise a period from the first confirmed case, which was March 18th, 2020, until the date of collection.

A total of 669 patients were evidenced with the following elements for description and analysis: date of death, sex, age, method of diagnosis, onset of symptoms, municipality of residence and preexisting disease. After obtaining the data, they were initially treated by applying a table in Word® and later described in a form built and filled in by the author of the research, through Google Forms®, for a better verification of the data and analysis through graphics obtained with the answers.

It was not necessary to submit the study for approval by the Research Ethics Committee, as the data used are in the public domain and without identification of participants.

RESULTS**According to the date of Death**

From the data collected in relation to the date of death, it is possible to observe in Figure 1 the trend of deaths registered by COVID-19 in the State of Paraíba in the period proposed for the study. The first death from the disease with comorbidity associated with preexisting obesity registered in the State was on April 20th, 2020, 34 days after the first record of death from

the virus in Brazil, this evolution of deaths from COVID-19 with obesity comorbidity may be better understood in Table 1.

In Figure 1, it is possible to observe that the highest concentration of deaths occurred in 2021 with 37 cases in January, 52 in February/2021 and having its highest in the months of March and April 2021 with 149 and 145 new deaths respectively, ending in May/2021 until the 17th with 49 cases, adding up to 432 deaths in 137 days of the year 2021, a large increase compared to the 237 that occurred in the year 2020 in 255 days.

According to sex

With regard to gender, of the deaths identified in obese patients affected by COVID-19 in the State of Paraíba, during the period proposed for the study, there is a higher prevalence in female patients, with a total sum of 360 patients for 309 males, as shown in Figure 2 below:

According to Age

With regard to age, of the deaths identified in obese patients affected by COVID-19 in the State of Paraíba, as illustrated in Figure 3, it can be observed that they occurred between 19 years and 103 years, with a higher frequency in the ages of 61 and 68 years with 24 patients each, followed by 66 years with 23 deaths, 58 years with 21 cases and 57 with 18 patients.

According to Diagnostic Method

Regarding the diagnostic methods for obtaining proof of coronavirus infection, of the identified deaths of obese patients affected by COVID-19 in the State of Paraíba during the period proposed for the study, six types of tests were presented, as can be seen in Figure 4, they are Swabs with 420 tests performed, rapid test with 153, antigenic test with 51, clinical imaging 32, clinical 11, and clinical epidemiological 2 tests performed.

According to Onset of Symptoms

Regarding the onset of symptoms, of the identified deaths of obese patients affected by COVID-19 in the State of Paraíba, during the period proposed for the study, the data indicate that the symptoms started

Table 1: Evolution of deaths from COVID-19 associated with obesity comorbidity, by month of occurrence in 2020.

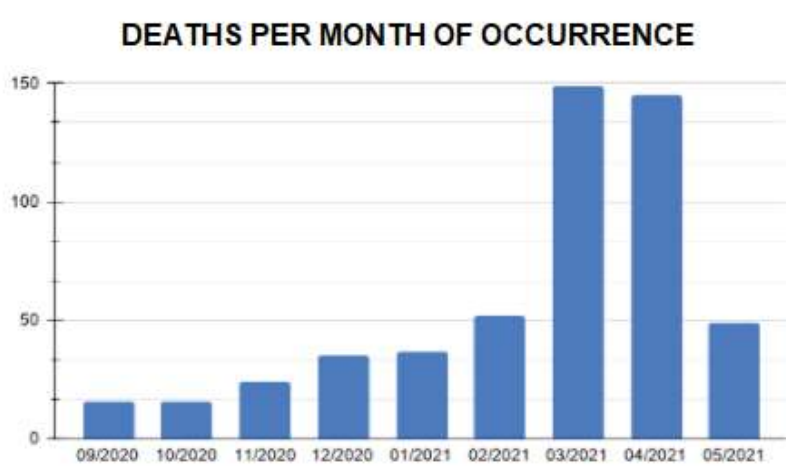
MONTH/2020	EVOLUTION OF DEATHS BY COVID-19 WITH ASSOCIATED OBESITY COMORBIDITY
April	05 Cases
May	46 Cases
June	41 Cases
July	34 Cases
August	24 Cases
September	16 Cases
October	16 Cases
November	24 Cases
December	35 Cases
TOTAL DEATHS PER COVID-19 WITH ASSOCIATED OBESITY COMORBIDITY IN THE STATE OF PARAÍBA IN 2020	241 CASES

Source: Research Data, 2021.

on April 16, 2020, with the death record after six days of its initial manifestations, grouped according to the month of symptom onset, 14 people had symptoms still

followed by the highest months of February with 103 people, March with 155, April with 100 and May with only 5 cases with the last day of symptoms on May 9th, 2021,

Figure 1: Deaths from COVID-19 associated with obesity comorbidity, per month of occurrence, 2021.



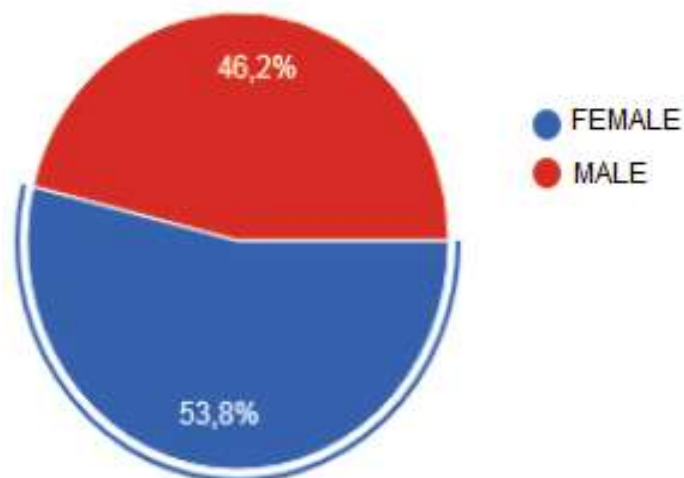
Source: Government of Paraíba, 2021.

in April 2020, 61 in May, 38 in June, 26 in July, 16 in August and in subsequent months with 22, 17, 37, 38. At the beginning of 2021, in January, 37 people were added

as shown in Figure 5 below:

According to Municipality of Residence Of the 223 municipalities that make up Paraíba, 102 had records of deaths from

Figure 2: Deaths from COVID-19 associated with obesity comorbidity by gender of victims, 2021.



Source: Government of Paraíba, 2021.

Figure 3: Deaths from COVID-19 associated with obesity comorbidity by age, 2021.



Source: Government of Paraíba, 2021.

COVID-19 with associated obesity during the period proposed for this study, with the highest number in the cities of João Pessoa, Campina Grande, Santa Rita, Cabedelo and Bayeux, and the lowest numbers in more interior cities such as Camalaú, Caiçara and Santo André, as shown in Figure 6.

According to Pre Existing Diseases

With regard to pre existing diseases of these patients with obesity committed by COVID-19, in the State of Paraíba, during the proposed period, there is evidence of the occurrence of twelve diseases associated with these deaths in addition to obesity, among them the vast majority of hyper-

tension, diabetes mellitus and heart disease, which are also among the first when it comes to deaths in general, of the 669 patients identified, 158 did not have any disease other than obesity, which can be seen in Figure 7.

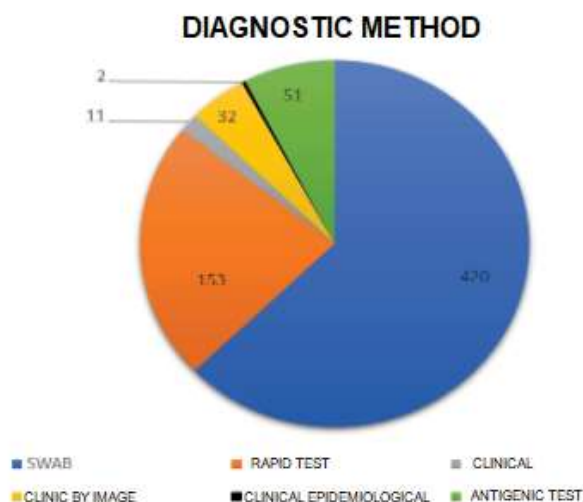
DISCUSSION

Since the appearance of the virus, senescence has been considered as the main risk factor for the serious evolution of the patient's clinical condition, 7 however, it appears that there are other conjunctions that also represent a worsening in the prognosis of these patients. The high BMI has already been attested, even though late that it is directly linked to severe cases of hospitalization, with demand for intensive care beds, use of invasive mechanical ventilation and an increase in the number of deaths, taking into account the pathophysiology of the disease, given the inflammatory conditions, damage to the respiratory system, thrombosis, associated heart disease, in addition to dysregulation of the immune system. 8

Thus, the epidemiological data released by the bulletin of the Government of the State of Paraíba reveal a high number of deaths when infected individuals present obesity as a preexisting disease. Of the 7.278 deaths reported in Paraíba until May 17th, 2021, 669 (9,09%) had obesity among the associated comorbidities. 6 The number of deaths of obese patients in Paraíba proves the need for greater attention and the development of strategies to be adopted by patients with this disease, affected by the virus, taking into account the pathophysiology of the disease.

With regard to morbidity and mortality related to the individual's gender, studies point to male fragility and as a consequence of this, they bring greater exposure due to the type of work performed, lack of health care, disrespect for the rules of social distancing, inattention to preventive measures, such as the use of masks and hand washing, which reflects on a weaker immune system, in addition to the low demand for health services. 9

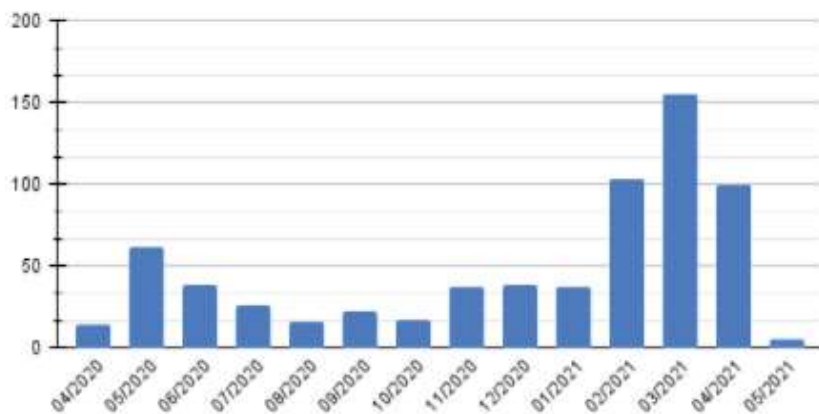
Figure 4: Diagnostic Methods to confirm COVID-19, related to patient deaths with obesity comorbidity, 2021.



Source: Government of Paraíba, 2021.

Figure 5: Distribution of deaths by COVID-19 of patients with comorbid obesity, by symptom onset, 2021.

DISTRIBUTION OF CASES PER MONTH OF THE BEGINNING OF SYMPTOMS



Source: Government of Paraíba, 2021.

Corroborating with this research, general deaths in Paraíba, when considering the patient's gender, show, according to the epidemiological bulletin, the percentage of 54,6% for males to 45,4% for females, but when considering deaths with obesity associated, this number changes to a prevalence of females with 53,8% to 46,2% of males, thus demonstrating that, once associated with comorbidities, the prevalence of num-

bers and statistics may not adjust.

What does not happen in the evidenced data in relation to the age of the patients, since in Paraíba the general bulletin released by the Ministry of Health coincides, where in Brazil in general it presents a higher concentration of deaths between the ages of 60 to 69 years, 10 as well as in Paraíba with the highest rates at the ages of 61, 66 and 68 years, thus maintaining an

invariability of the patient with or without obesity in the analysis of this point.

Regarding the tests used, their authenticity results from the agreement of the circumstances and the correct choice of the type of test that will be used, given the sensitivity and specificity of each test, in addition to the latency period and higher viral load not often coinciding with the moment of diligence of this patient to the health service, requiring verification and confirmation of information for the selection of the test. 11 Among the six tests evidenced in deaths with associated obesity, the ones that showed a higher proportion were the Swab tests and the rapid test, totaling 85,7%, their selection is based on the number of days of presentation of initial symptoms. 6

Which in turn differ according to the incubation period and infection that the individual presents, varying between 2 and 14 days after contamination, considering all types of symptoms related to coronavirus infection, be it flu, headache or loss of smell and taste. 11 It was evident (Figure 1 and 5) that the concentration of deaths and onset of symptoms were within the variation period described above.

Regarding the distribution of deaths by municipality, it is identified that most cases are concentrated in larger cities such as the capital João Pessoa and the city of Campina grande, either in relation to general deaths or of patients who were obese, even by percentage of inhabitants residing in these cities, even maintaining a uniformity of data, specific deaths with preexisting obesity are only identified in 102 municipalities and not extending to the whole of Paraíba, with a distribution of 49 cities that had only one death, 23 cities with 2 deaths in addition of those who had more than 3 deaths, totaling 30 municipalities.

In addition, this research identified the existence of another twelve diseases that were together with obesity described as pre existing diseases, 6 obesity alone already presents a high risk of death, given the respiratory damage, metabolic impairment, thrombosis problems, impaired glucose absorption, which end up leading to other

diseases that studies have already shown to also cause isolated complications in coronavirus infection. 8

CONCLUSION

The study performed a descriptive and quantitative analysis regarding the mortality of obese patients affected by coronavirus infection in Paraíba, thus demonstrating

that obesity is an important factor associated with mortality in Paraíba, in addition to supporting the importance of vaccination of this public and reaffirming the need for public measures and development of protocols to serve this public.

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