

# Obesity in Severe Acute Respiratory Syndrome death records by Covid-19, Brazil, 2021

## Obesidade nos registros de óbito de Síndrome Respiratória Aguda Grave por Covid-19, Brasil, 2021

## Obesidad en los registros de defunción del síndrome respiratorio agudo severo por Covid-19, Brasil, 2021

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# REVISA

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According to the World Health Organization (WHO), overweight and obesity can be defined as the abnormal or excessive accumulation of fat, which can be harmful to health.<sup>1</sup> These public health problems have acquired pandemic proportions, where approximately, 4 million people die each year from it or from related complications.<sup>1,2</sup>

Thus, and according to estimates, obesity since 1975 around the world has almost tripled and, in 2016, more than 1.9 billion adults who were 18 years old or more were overweight and of these, more than 650 million were obese.<sup>2</sup> Obesity has a high prevalence in Europe and the United States (USA), generating an incidence greater than 40%.<sup>3,4</sup>

Currently, obesity and Covid-19 are considered worldwide pandemics, and for some researchers, obesity can greatly aggravate the impacts on people affected by this viral disease.<sup>4</sup> In relation to obese patients, clinically considered severe with a diagnosis of Covid-19, who have a high body mass index (BMI), are at greater risk than non-serious.<sup>3,4</sup>

Obese patients who develop Covid-19 and who have a high BMI have a greater need for treatment in the Intensive Care Unit (ICU) and the use of mechanical ventilation (MV), as a form of support for those who are unable to develop respiratory incursions spontaneously.<sup>5,6</sup> In addition to obesity, metabolic syndrome (MS) can allow the onset of damage to various organs of the body, stimulating their irregular functioning, when faced with a high degree of stress in which the patient is, during the your treatment.<sup>5,6,7</sup>

For some researchers, the problem of obesity is accompanied in the organism by the increased expression of the angiotensin 2 converting enzyme (ACE2), which would have the possibility of binding with the virus' S protein, and thus, would develop an entry for invasion of the virus, making the heart and lungs of the affected patient very vulnerable to Covid-19.<sup>7-9</sup> In this sense, ACE2 constitutes an enzyme component of the renin angiotensin aldosterone system (RAAS), being responsible for the process of conversion of angiotensin II into angiotensin 1-7 (Ang 1-7), deriving its pathogenesis from numerous cardiovascular-type disorders, such as arterial hypertension (AH), arteriosclerosis and myocardial infarction.<sup>5-10</sup>

Thus, it constitutes itself as a component of the well-known renin-angiotensin system (RAS), this genomic sequence being discovered in the year 2000.<sup>7-11</sup> Analyzing its structural issue, ACE-2 is similar to the classic one, however, in relation to their functionality, because they present opposition, because ACE converts angiotensin 1 to angiotensin 2, causing the emergence of deleterious effects, due to the stimulation process of known AT1 receptors, allowing the expansion of sympathetic activity, and also, the reabsorption of salt and water, in addition to inflammation, vasoconstriction, and also the release of aldosterone and vasopressin, thus stimulating endothelial dysfunction, tissue fibrosis, and HA.<sup>9-13</sup>

Other obesity-related problems are that it is accompanied by an "overactivated" inflammation process, as well as an immune response, which may allow the emergence of an excessive inflammatory response, in addition to an immune fragility related to Covid-19.<sup>6,7,8,9,10</sup> Even as weaknesses related to patients diagnosed with obesity, increased abdominal pressure, chest movements and their limited expansion can be mentioned as a complication, leading to the respiratory process in an insufficient way, which require the emergence of its compensatory function.<sup>8-10</sup>

In Brazil, the Ministry of Health (MS) through its Health Surveillance Secretariat (SVS), using the Severe Acute Respiratory Syndrome Database - SRAG 2021 (SIVEP-Influenza), identified several comorbidities and related risk factors to death records of SARS by Covid-19, up to epidemiological week 42 (SE 42).<sup>14</sup> As comorbidities and risk factors were identified, respectively, heart disease, diabetes mellitus (DM), obesity, neurological diseases, kidney diseases, pneumopathies, immunosuppression diseases, asthma, liver diseases, hematological diseases and Down's Syndrome (DS), as shown in table 1.<sup>14</sup>

In a universe of 386,094 entries of comorbidities and risk factors related to death records from SARS by Covid-19, heart diseases registered the highest preponderance with 39.2% (n=151,358) and DS the lowest with 0.4% (n=1,384).<sup>14</sup> In this context, obesity accounted for the third largest preponderance with 11.9% (n=44,951) among the comorbidities and risk factors identified among the SARS death records by Covid-19.<sup>14</sup>

Among people under the age of 60 years, it was possible to identify a universe of 114,950 death records, with comorbidities and risk factors for SARS by Covid-19, and of these, heart diseases accounted for the greatest preponderance with 32.3% (n=37,176) and the lowest DS with 0.8% (n=936).<sup>14</sup> In relation to people aged over 60 years, who reported death from comorbidities and risk factors from SRAG/Covid -19, heart diseases registered the highest preponderance with 42.1% (n=114,182) and DS the lowest with 0.2% (n=448).<sup>14</sup>

**Table 01** - Frequency of obesity releases identified in death records of people aged under 60 years and aged 60 years or more with Severe Acute Respiratory Syndrome (SRAG) by Covid-19, up to SE 42, Brazil, 2021 (n=386.094):\*,\*\*,\*\*\*

<b>Total</b>	<b>&lt; 60 years</b>	<b>60 years or more</b>	
<b>f (%)</b>	<b>f (%)</b>	<b>f (%)</b>	
Heart Diseases	151.358 (39,2)	37.176 (32,3)	114.182 (42,1)
Diabetes	107.644 (27,9)	28.437 (24,7)	79.207 (29,2)
Obesity	44.951 (11,6)	26.248 (22,8)	18.703 (6,9)
neurological diseases	18.598 (4,8)	3.411 (3)	15.187 (5,6)
kidney diseases	18.360 (4,8)	5.026 (4,4)	13.334 (4,9)
Lung diseases	16.786 (4,3)	2.708 (2,4)	14.078 (5,2)
Immunosuppression	11.418 (3)	4.690 (4,1)	6.728 (2,5)
Asthma	8.267 (2,1)	3.555 (3,1)	4.712 (1,7)
Liver diseases	4.369 (1,1)	1.785 (1,6)	2.584 (1)
Haematological diseases	2.959 (0,8)	978 (0,9)	1.981 (0,7)
Down's syndrome	1.384 (0,4)	936 (0,8)	448 (0,2)
<b>Total</b>	<b>386.094 (100)</b>	<b>114.950 (100)</b>	<b>271.144 (100)</b>

Source: SIVEP-Gripe, MS, 2021.

\* Table adapted by the authors; \*\* Data updated on 10/25/2021 at 12:00; \*\*\* Data is subject to constant revisions.

In addition to other issues usually related to obesity, such as obstructive sleep apnea syndrome (OSAS), glucose decompensation, chronic comorbidities, endocrine, liver, among others can be cited as impairments due to this metabolic and inflammatory disease. 8-13 Thus, the importance and need for the development of actions to combat and control obesity and Covid-19 is easily perceived, requiring the redoubling of care, with regard to the correct hand hygiene, in the use of masks in preventing access to the pandemic virus, the immunization process in its various stages and the respective reinforcements made available, in addition to the awareness and active participation of society in its efficient and effective combat and control.

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