Scientific Electronic Archives
ISSN 2316-9281

Scientific Electronic Archives

Issue ID: Vol.19 (5), Set/Oct 2026, p. 1-7
DOI: http://dx.doi.org/10.36560/19520262250
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Clinical and epidemiological profile of covid-19 in elderly people in northern Mato Grosso

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Abstract: This study evaluated the clinical-epidemiological profile of elderly individuals who tested positive for COVID-19 in the northern region of Mato Grosso. This is an exploratory, descriptive, and explanatory study conducted with elderly individuals who tested positive for SARS-CoV-2 in Sinop-MT, using a quantitative-qualitative instrument approved by the Research Ethics Committee. Among the 215 participants, 72.09% were women, with a mean age of 69.09 years; 65.12% were white, 72.09% had low education levels, and 65.11% were retired. The majority presented one or more comorbidities (75.81%) and were on continuous medication (76.75%). The years 2020 and 2021 concentrated the highest incidence of cases; 41.86% presented symptoms for up to 7 days, and 64.65% used medication to treat the disease. 97.67% of the elderly were vaccinated, however 49.77% became ill before the vaccine. Regarding blood type, 50.69% were type O and 41.86% were type A. Those most affected were women, white, with low education levels and retired. The highest proportion of long-term COVID was observed in type O.
Keywords: COVID-19; Elderly; Epidemiological Profile; Blood Type.

Introduction

Severe Acute Respiratory Syndrome 2 (SARS-CoV-2) is a contagious disease caused by the novel coronavirus, which belongs to the *Coronaviridae* family. Coronavirus Disease 2019 (COVID-19) was first identified in Wuhan, China, in December 2019 and rapidly disseminated worldwide, emerging as a significant public health concern. It was declared a pandemic by the World Health Organization (WHO) in mid-March 2020. Furthermore, this disease precipitated a humanitarian crisis with far-reaching economic and social repercussions on a global scale (CRUZ et al., 2022; UNA-SUS, 2020; WERNECK; CARVALHO, 2020).

According to the Brazilian Ministry of Health, SARS-CoV-2 is predominantly transmitted via respiratory droplets, nasal secretions, and direct contact with infected individuals through coughing, sneezing, or even speaking, releasing viral particles into the air that can be inhaled or come into contact with the mucous membranes of others. The clinical presentation is variable, ranging from asymptomatic cases to severe conditions that may lead to respiratory failure and, in some instances, death (BRASIL, 2020; BRITO et al., 2020; SOUZA et al., 2021).

Infection occurs through viral entry into the host cell, mediated by the interaction between the Spike protein and the cell surface receptor, angiotensin-converting enzyme 2, which in humans is predominantly found on cells of the lower respiratory tract. Following entry, the virus initiates its replication process within the host cell, resulting in the production of new viral particles that are released by budding, ultimately causing host cell lysis. The incubation period averages 7 days, after which the individual may remain asymptomatic or develop the aforementioned symptomatology (BRITO et al., 2020).

SARS-CoV-2 infection can affect any individual, irrespective of biological or environmental factors. However, studies indicate that the elderly population accounts for a significant proportion of cases, hospitalizations, and mortality rates compared to other age groups. Although the adult population is the most extensively affected, older adults are considered a high-risk demographic,

exhibiting a greater likelihood of developing severe disease and consequently presenting higher fatality rates and worse prognoses when compared to other age cohorts (FERREIRA; MAIA; AZEVEDO, 2023; SANTOS, 2023).

Moreover, many older adults may present with manifestations characterized as late-onset or residual sequelae of the infection, defined as Long COVID. When present, these symptoms typically emerge or persist for up to 12 weeks following the acute phase of the illness and are not attributable to secondary conditions. Among those who developed severe forms of the disease, certain late signs and symptoms were more prevalent, including anxiety, depression, mood instability, dyspnea, cough, myalgia, ageusia, and anosmia, among others (SILVA et al., 2023).

Since the Austrian physician and biologist Karl Landsteiner discovered the ABO blood group system in 1901, numerous studies have been conducted to establish a correlation between this system and various diseases. Several investigations have explored the relationship between ABO blood type and the severity of SARS-CoV-2 infection, demonstrating that individuals with blood group A had a higher probability of developing complications when infected with the virus, whereas individuals with blood type O exhibited a reduced risk. These findings suggest that blood type may function as a biomarker of susceptibility to the virus in question (ALMEIDA; ROSSI; CARDOSO, 2020; FERREIRA, 2023; PALHANO, 2021; STEVANELLI et al., 2023; ZHAO et al., 2021).

Based on the information presented above, this study is justified by the need to investigate a potential correlation between the clinical presentation of elderly residents of Sinop, a municipality located in the northern region of Mato Grosso, who tested positive for COVID-19, and their ABO blood types. This age group was among the most profoundly impacted by the pandemic, facing a multitude of challenges. Therefore, further research in this area is crucial. Such studies can provide valuable insights to support the formulation of public health policies, leading to more effective measures to address the needs of this vulnerable population.

Methods

This is an exploratory, descriptive, and explanatory study conducted with elderly individuals who tested positive for SARS-CoV-2 and reside in the city of Sinop, Mato Grosso, Brazil. Data were collected using a quantitative-qualitative instrument duly approved by the Municipal Health Department and the Research Ethics Committee, in compliance with the National Research Ethics Commission, under CAAE: 39132020.1.0000.8097.

The research form assessed clinical aspects (presence or absence of symptoms), contact with COVID-19-positive individuals, travel history to other cities or states; symptom onset, end of isolation period, laboratory diagnosis, presence or absence of comorbidities, medication use for COVID-19 treatment, complementary examinations, disease outcome (hospitalization, home isolation, or intubation/Intensive Care Unit admission), and epidemiological variables defined by the Brazilian Institute of Geography and Statistics (IBGE), including age, gender, occupation/profession, workplace/area of activity, race/skin color (White, Black, Mixed-race/Brown, Asian, and Indigenous), education level, and healthcare access.

A 95% confidence level was adopted for the sample. The sampling error was established at 2%. According to IBGE (2022), the city of Sinop, located in the northern region of Mato Grosso state, has an estimated population of 196,067 inhabitants in 2022. The estimated elderly population, comprising individuals aged ≥ 60 years, was based on approximate calculations derived from the IBGE Census, totaling 15,303. The preliminary estimate for the proportion of the phenomenon under investigation was 7.81%. As the elderly population is below 100,000 inhabitants, the basic formula for calculating sample size for finite populations was applied, according to Gil (2008), yielding an ideal sample size of 730 elderly individuals.

Data were tabulated according to the variables mentioned above and analyzed using Microsoft Excel version 2010 software.

Inclusion criteria for study participants were age ≥ 60 years, a positive test for SARS-CoV-2, and residency in the aforementioned city. Exclusion criteria included individuals presenting with long-term physical, mental, intellectual, or sensory impairments, as defined by Art. 2 of the Brazilian Law for the Inclusion of Persons with Disabilities (Law No. 13,146 of July 6, 2015) (BRASIL, 2015).

Results and discussion

The study included 215 elderly individuals infected with SARS-CoV-2. Of these 215 participants, 72.09% were female and 27.91% were male. The age range of the elderly participants varied from 60 to 93 years, with a mean age of 69.09 years. The majority of the elderly (61.86%) were between 60 and 70 years of age. Regarding race/skin color, 65.12% self-identified as White, 28.37% as Mixed-race/Brown, 5.12% as Black, 0.93% as Asian, and 0.47% as Indigenous. Concerning education, 72.09% of the elderly had completed or incomplete elementary education, 17.67% had completed or incomplete high school, 6.98% had completed higher education, and 3.26% held a postgraduate degree. Regarding occupation, the majority of the elderly (65.11%) reported being retired/pensioners, while the remaining participants (34.89%) reported still engaging in some form of paid occupation, with prominent roles including cleaning services, farming, self-employed workers, teaching, civil construction, and automotive services, among others (Table 1).

Table 1. Sociodemographic characteristics of elderly individuals affected by COVID-19 in Sinop, Mato Grosso, Brazil

Genre	*N*	%

Female	155	72.09
Male	60	27.91
Age group (years)	*Male n (%)*	*Female n (%)*
60–70	31 (14.42)	102 (47.44)
71–80	25 (11.63)	47 (21.86)
> 80	4 (1.86)	6 (2.79)
Self-reported race/skin color		
Asian	–	2 (0.93)
White	45 (20.94)	95 (44.19)
Indigenous	–	1 (0.46)
Mixed-race/Brown	11 (5.12)	50 (23.25)
Black	4 (1.86)	7 (3.25)
Educational level		
Complete elementary education	8 (3.72)	14 (6.51)
Incomplete elementary education	37 (17.21)	96 (44.65)
Complete high school	6 (2.79)	24 (11.16)
Incomplete high school	2 (0.93)	6 (2.79)
Complete higher education	4 (1.86)	9 (4.19)
Incomplete higher education	1 (0.47)	1 (0.47)
Postgraduate degree	2 (0.93)	5 (2.33)
Retired/Pensioner		
Yes	46 (21.40)	94 (43.72)
No	14 (6.51)	61 (28.37)

Regarding the year of infection, the majority of elderly individuals were infected in 2020 and 2021 (72.09%), with a progressive decline in subsequent years. Of the 215 elderly participants, 48.06% were diagnosed with COVID-19 via nasopharyngeal/oropharyngeal RT-PCR testing, 39.2% through serology (IgM/IgG), 9.3% by clinical diagnosis, and 3.43% through antigen testing. The primary mode of COVID-19 acquisition occurred in household settings for 54.88% of the elderly, followed by contact with a positive individual in other locations (32.10%), travel (7.44%), and occupational exposure (5.58%).

Regarding the presence of comorbidities, the majority of elderly individuals (75.81%) presented with one or more comorbid conditions. Hypertension was the most frequently reported comorbidity (28.37%), followed by Diabetes mellitus (14.41%), cardiovascular diseases (13.95%), and osteoarticular conditions (8.37%).

C oncerning symptom duration, 41.86% reported having symptoms for up to 7 days, 22.79% for 7 to 14 days, 28.37% presented with symptoms lasting more than 14 days, and 6.98% were asymptomatic. The majority of elderly individuals presented with more than one disease-related symptom, with the most frequent being: myalgia (21.5%), headache (15.8%), cough (15%), fever (15%), ageusia (13.8%), anosmia (13.4%), and respiratory distress (5.4%) (Table 2).

Regarding care needs and treatment during COVID-19 infection, 92.09% of elderly individuals remained in home isolation, 7.44% required hospitalization/ward admission, and 0.47% required ICU admission/intubation. Concerning medication use during the illness, 13.49% (n = 29) of the elderly reported not using any medication, 2.33% (n = 5) could not recall, 6.98% (n = 15) used home remedies (herbal teas), 4.65% (n = 10) used hospital-prescribed medication, 7.90% (n = 17) used antibiotics, analgesics, and anti-inflammatory drugs, and 64.65% (n = 139) used ivermectin and/or azithromycin and/or hydroxychloroquine and/or antihistamines and/or vitamins and/or zinc and/or expectorants.

In the present study, 33.48% (n = 72) of the elderly reported having no symptoms after the infection period. However, 40.46% of the elderly reported that symptoms persisted for more than one year, which may be considered a detrimental factor for the well-being and quality of life of these individuals. The most frequently reported symptoms were memory loss 22.31% (n = 48), weakness and fatigue interfering with daily life 16.27% (n = 35), joint pain 15.8% (n = 34), muscle pain 13.94% (n = 30), headache 13.48% (n = 29), anxiety 9.3% (n = 20), post-exertional malaise 8.36% (n = 18), difficulty concentrating 6.04% (n = 13), hair loss 8.36% (n = 18), and difficulty breathing or shortness of breath 4.65% (n = 10).

Regarding COVID-19 vaccination, 97.67% of the elderly received at least one dose. Of these, 49.77% reported having contracted the disease before receiving the first vaccine dose, while 47.90% contracted it after receiving the first dose. The most frequently administered vaccine among the elderly was CoronaVac, used in 32.38% of cases, followed by AstraZeneca at 25.73%, Pfizer at 10.48%, and Janssen at 2.84%, while 28.57% received more than one type of vaccine.

Concerning ABO blood typing, within the evaluated population, 50.69% of the elderly were blood type O, followed by 41.86% type A, 4.19% type AB, and 3.26% type B (Table 3). Regarding symptoms presented during COVID-19 infection, 90% of elderly individuals with blood type A were symptomatic, presenting with symptoms such as fever, headache, cough, myalgia, anosmia, and ageusia, whereas 96.33% of elderly individuals with blood type O were symptomatic, with symptoms

similar to those of the blood type A group. It is noteworthy that further studies on this topic are warranted.

Among the elderly who remained in home isolation, the most frequent blood type was O, accounting for 45.59% (n = 98), followed by type A with 39.06% (n = 84), type B with 3.26% (n = 7), and type AB with 4.18% (n = 9). Regarding elderly individuals who required ward hospitalization, the highest occurrence was observed in blood type O, with 4.65% (n = 10), followed by type A with 2.79% (n = 6), while the single case requiring ICU support was blood type O (0.47%; n = 1). When analyzing post-COVID symptoms, elderly individuals with blood type O presented with prolonged symptoms, totaling 35.34% (n = 76), whereas those with blood type A presented with prolonged symptoms in 24.18% (n = 52) of cases (Table 4).

Regarding the age group of participants, similar data were found in the study by Marrocos et al. (2021), conducted through an online form shared with elderly individuals throughout Brazil, in which the highest incidence of SARS-CoV-2 infection occurred in the 60–70 age group (65%), followed by the 71–80 age group (28%) and those over 80 years (7%). Concerning race/skin color, according to the latest IBGE census data, 45.35% of the Brazilian population self-identifies as Mixed-race/Brown, 43.5% as White, 10.2% as Black, 0.6% as Indigenous, and 0.4% as Asian. Notably, in the present sample, the trend did not follow the same pattern for the two largest percentages observed in the IBGE data, and the Asian and Indigenous ethnicities also presented different proportions than expected. This result may be explained by the fact that the city in question, when colonized in the mid-1970s, received most of its early inhabitants from the southern states of Paraná, Santa Catarina, and Rio Grande do Sul (INTERLEGIS, 2021).

Table 2. Symptoms and duration of COVID-19 in elderly individuals, according to gender, in Sinop, Mato Grosso, Brazil

Symptom duration	*Male n (%)*	*Female n (%)*
Asymptomatic	4 (1.86)	11 (5.12)
Up to 7 days of symptoms	24 (11.16)	66 (30.70)
Up to 14 days of symptoms	13 (6.05)	36 (16.74)
More than 14 days of symptoms	19 (8.84)	42 (19.53)
Signs and symptoms	*Male n (%)*	*Female n (%)*
Myalgia	37 (17.20)	103 (47.90)
Headache	25 (11.62)	76 (36.74)
Cough	28 (13.02)	70 (32.55)
Fever	24 (11.16)	73 (33.95)
Ageusia	16 (7.44)	77 (35.81)
Anosmia	16 (7.44)	70 (32.55)
Respiratory distress	9 (4.18)	26 (12.09)
Total	155 (23.85)	495 (76.15)

Table 3. ABO blood type distribution among elderly individuals, according to gender, in Sinop, Mato Grosso, Brazil

Blood type	*Male n (%)*	*Female n (%)*
A	19 (8.84)	71 (33.02)
AB	2 (0.93)	7 (3.26)
B	1 (0.47)	6 (2.79)
O	38 (17.67)	71 (33.02)

Table 4. Blood type of the elderly versus duration of post-COVID-19 symptoms, according to gender, in Sinop, Mato Grosso

Blood type	Male (n)				Female (n)			
Time	A	AB	B	O	A	AB	B	O
Up to 3 months	2	0	1	2	6	1	0	12
Up to 6 months	1	1	0	3	4	1	0	4
Up to 9 months	1	0	0	1	3	0	0	0
1 year	1	0	0	3	2	1	1	3
More than a year	4	1	0	11	19	2	4	31
None	8	0	0	17	30	1	1	16
It persists to this day	2	0	0	1	7	1	0	5
Total	19	2	1	38	71	7	6	71

Regarding the site of infection, the fact that

the disease is predominantly transmitted from person to person via droplets, respiratory secretions, contaminated surfaces, and direct contact with infected individuals corroborates the high rates of infection and transmission within the household context, as well as in occupational or educational settings, which are environments where closer and more prolonged contact typically occurs (CRUZ et al., 2022).

Marrocos et al. (2021), when selecting elderly individuals infected with SARS-CoV-2 aged over 80 years, found that 94% presented with one or more comorbidities. In the studies by Siqueira, Marcon and Trevisol (2022) and Ferreira, Maia and Azevedo (2023), hypertension was the most prevalent comorbidity among elderly individuals infected with SARS-CoV-2, corroborating the findings of the present study. The presence of comorbidities in the elderly may increase the risk of disease aggravation and even lead to death (SANTOS, 2023).

The majority of elderly individuals presented with symptoms for up to 7 days; however, a considerable number experienced symptoms for more than 14 days, which may be closely linked to the presence of pre-existing comorbidities (HUANG et al., 2020). These symptoms were similar to those found in the study by Siqueira, Marcon and Trevisol (2022). Regarding the need for hospitalization, the present study differed significantly from the study conducted by Mascarello et al. (2021), in which the COVID-19 hospitalization rate was 27.35% among individuals aged 60 years or older, and the ICU admission rate in this same age group was 7.31%, revealing a better clinical outcome for the elderly individuals assessed in the present study.

In the study by Marrocos et al. (2021), elderly individuals with mild COVID-19 symptoms reported the use of medications such as dorflex, ivermectin, azithromycin, vitamins, beta-blockers, zinc, hydroxychloroquine, nimesulide, antiemetics, and anticoagulants. In the study by Siqueira, Marcon and Trevisol (2022), the most prominent medication use was antibiotics, specifically azithromycin, used by 351 elderly individuals, in addition to analgesics (401 elderly individuals) and non-steroidal anti-inflammatory drugs (125 elderly individuals).

Tosato et al. (2021) reported that approximately 50% to 80% of patients who had COVID-19 complained of persistent symptoms months after laboratory-confirmed viral clearance; however, in the present study, fewer than 50% of participants reported persistent symptoms, reaffirming the better clinical outcome observed.

Regarding COVID-19 vaccination, considering that age is a predisposing factor for the severity and mortality of COVID-19, vaccination is essential for protecting these individuals. However, a decline in Brazilian vaccination coverage has been observed over recent years, not only for COVID-19, which may be explained by the false sense of security that vaccine-preventable diseases no longer exist, thus making vaccination unnecessary, or even that the disease poses a lower risk than the adverse events that could occur with vaccination (LAURENTI et al., 2023).

In the study by Pereira et al. (2023) on COVID-19 immunization of elderly individuals with comorbidities attended at a teaching health center, the most frequently administered vaccine among the elderly was CoronaVac, used in 64.50% of cases, followed by the AstraZeneca immunizer in 35.31% of the elderly. It should be noted that in this study, some elderly individuals reported having received more than one dose but could not recall all the vaccines used and selected only one or two vaccines they had received.

Regarding the topic of blood typing, it is observed that the majority of the Brazilian population presents the O phenotype, with a mean of 53.35%, followed by phenotype A with a mean of 32.98%, phenotype B with 10.85%, and phenotype AB with 2.82% (MENEGATI et al., 2022). Therefore, the present study partially corroborated this scenario.

In the study by Menegati et al. (2022), 93.8% of individuals with blood group A and 100% of individuals with blood group O were symptomatic when infected with the disease, commonly presenting with headache, anosmia, and ageusia. It is noteworthy that further studies on this topic are warranted.

Leal (2023), in an integrative literature review, pointed out that in 63.63% of the studies analyzed, an association was highlighted between blood group A and a higher risk and severity of COVID-19, which was not observed in the present study. However, it should be taken into consideration that the majority of the elderly in the present sample had blood type O, thus precluding such a comparison.

Ferreira (2023) noted that some authors, in studies assessing the association between the ABO blood group system and COVID-19 infection and severity, suggested that individuals with blood group O had a lower risk of infection and less severe disease when affected, compared to individuals belonging to other groups, and that blood group A, in contrast, would be the most affected by infection and disease severity. It is worth noting that in the present study, blood group O had a higher number of individuals, which could explain the scenario presented here, underscoring the need for further studies on this topic.

Acknowledgments

We thank the Postgraduate Program in Health Sciences (PPGCS) of the Federal University of Mato Grosso (UFMT), Sinop Campus, for the academic and institutional support that made this study possible.

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