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Original Article

Profile of patients with conditions unrelated to COVID-19: comparison between pre-pandemic and panemic

Perfil epidemiológico de pacientes com condições não relacionadas à COVID-19: comparação entre pré-pandemia e pandemia

Perfil epidemiológico de pacientes con afecciones no relacionadas con COVID-19: comparación entre prepandemia y pandemia

Tainá Bustamante Sanches Martos[I], **Luiz Humberto Vieri Piacezzi**[I], **Karina Aparecida Lopes da Costa**[I], **Maria Carolina Barbosa Teixeira Lopes**[I], **Ruth Ester Assayag Batista**[I], **Cássia Regina Vancini Campanharo**[I]

[I] Universidade Federal de São Paulo, São Paulo, São Paulo, Brazil

Abstract

Objective: to compare the epidemiological profile of patients treated during the pandemic for conditions unrelated to COVID-19 and users treated in the pre-pandemic period. **Method:** a retrospective study was carried out at *Hospital São Paulo*, from August 2021 to August 2023, with two groups (pre and pandemic), stratified into chunks. Data collection took place through electronic medical records with the first 20 participants of each month. Descriptive analysis of continuous variables was performed using mean, standard deviation, median, minimum and maximum, considering a p-value <0.05. **Results:** 520 patients were analyzed, divided equally, with similar mean age, sex, race and length of hospital stay, but there were differences in hospitalization units and outcomes. **Conclusion:** similarity was found between the two groups, with more admissions to Intensive Care Units and more deaths in the pre-pandemic group and more hospitalizations in the emergency department in the pandemic group, with more discharges.

Descriptors: COVID-19; Emergency Medical Services; Medical Care; Nursing; Emergencies

Resumo

Objetivo: comparar o perfil epidemiológico de pacientes atendidos durante a pandemia, por condições não relacionadas à COVID-19, e usuários assistidos no período pré-pandemia. **Método:** estudo retrospectivo, realizado no Hospital São Paulo, de agosto de 2021 a agosto de 2023, com dois grupos (pré e pandemia), estratificados em blocos. A coleta de dados ocorreu por meio do prontuário eletrônico com os primeiros 20 participantes de cada mês. Análise descritiva das variáveis contínuas foi realizada por meio da média, desvio padrão, mediana, mínimo e máximo, considerando valor de p<0,05. **Resultados:** foram analisados 520 pacientes, divididos igualmente, com média de idade, sexo, raça e tempo de internação semelhante entre eles, porém houve

diferenças nas unidades de internação e desfechos. **Conclusão:** constatou-se similaridade entre os dois grupos, ocorrendo mais admissões em Unidades de Terapia Intensiva e mais óbitos no grupo pré-pandemia, e mais internações no serviço de emergência no grupo pandemia com mais altas.
Descritores: COVID-19; Serviços Médicos de Emergência; Cuidados Médicos; Enfermagem; Emergências

Resumen

Objetivo: comparar el perfil epidemiológico de pacientes atendidos durante la pandemia por afecciones no relacionadas con la COVID-19 y usuarios atendidos prepandemia. **Método:** estudio retrospectivo, realizado en Hospital São Paulo, de agosto de 2021 a agosto de 2023, con dos grupos (pre y pandemia), estratificados en bloques. La recolección de datos se realizó a través de historia clínica electrónica con los primeros 20 participantes de cada mes. Se realizó análisis descriptivo de variables continuas utilizando media, desviación estándar, mediana, mínimo y máximo, considerando valor de p<0,05. **Resultados:** se analizaron 520 pacientes, divididos en partes iguales, con promedio de edad, sexo, raza y duración de estancia hospitalaria similares, pero hubo diferencias en unidades de hospitalización y resultados. **Conclusión:** se encontró similitud entre los dos grupos, con más ingresos en Unidades de Cuidados Intensivos y más muertes en el grupo prepandemia, más ingresos en urgencias en el grupo pandemia, con más altas.
Descriptores: COVID-19; Servicios Médicos de Urgencia; Atención Médica; Enfermería; Urgencias Médicas

Introduction

The emergence of the SARS-CoV-2 virus in December 2019 in the city of Wuhan, located in the province of Hubei, China, had an impact on global socioeconomic dynamics. This resulted in changes in the population's lifestyle. Belonging to the *Coronaviridae* family, this virus causes a variety of symptoms, including cough, fever and several multisystemic pathophysiological conditions, resulting in different clinical presentations: from asymptomatic cases, which are the most common, to severe cases.[1–2]

In March 2020, the World Health Organization declared the COVID-19 pandemic. Due to the highly transmissible nature of this infectious disease, for which there was limited knowledge, hospital care services were restructured. In the Brazilian context, ordinances were implemented authorizing the creation of Intensive Care Unit (ICU) beds for exclusive care of COVID-19 patients. Moreover, resources from the Funding Block for Public Health Actions and Services were allocated to all states, aiming to combat this condition.[3–5]

In response to the Public Health Emergency of National Concern declared by the Event Monitoring Committee of the Ministry of Health, a Bill on quarantine was approved to contain the potential overload of hospitals due to the increase in infections. At the same time, a series of non-pharmacological measures were recommended to the population to control and prevent COVID-19, including social distancing, ensuring good ventilation in closed environments, adequate hand hygiene, practicing respiratory etiquette and wearing masks.[6–7]

As part of the measures adopted by hospitals, outpatient care and elective procedures were suspended to contain the spread of the virus. Elective surgeries were suspended mainly to avoid exposure to the virus, preserve critical care beds for patients with Severe Acute Respiratory Syndrome, and avoid a crisis in the public and private health systems.[8]

As a result, several healthcare institutions have observed a drop in the number of emergency room visits for illnesses unrelated to COVID-19. In Brazil, for instance, there was a 57% reduction in visits to the emergency department of a private hospital specializing in cardiovascular care compared to the previous year. In the United States of America (USA), research based on the National Syndromic Surveillance Program (NSSP) revealed a 42% decrease in emergency room visits. Moreover, a 23% reduction was identified in admissions for acute myocardial infarction, 20% for stroke and 10% for hyperglycemic crisis. In China, a 62% drop in demand for hospital services was also observed, compared to the same period last year. This phenomenon can be attributed mainly to the fear of exposure to the virus in a hospital setting, which can aggravate high-risk clinical conditions and contribute to increased morbidity and mortality related to chronic non-communicable diseases, especially cardiovascular diseases.[9–12]

It is believed that understanding this context can contribute to implementing educational measures for people with chronic noncommunicable diseases, emphasizing the importance of regular monitoring of their health, regardless of the situation, to avoid increased morbidity and mortality from these diseases.

Therefore, this study aimed to compare the epidemiological profile of patients treated during the pandemic for conditions unrelated to COVID-19 and users assisted in the pre-pandemic period.

Method

This is a retrospective and analytical study, based on STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) recommendations, carried out from 2021 to 2023, at *Hospital São Paulo* (HSP), a university hospital of the *Universidade Federal de São Paulo* (UNIFESP), with 750 beds, a reference for highly complex cases, located in southern São Paulo.

The population consisted of adult patients, aged 18 years or older, without a confirmed diagnosis of COVID-19, treated in the Reception and Assessment with Risk stratification sector of the emergency service (ES) and hospitalized between March 16, 2019 and March 15, 2020 (pre-pandemic group) and March 16, 2020 to March 16, 2021 (pandemic group). Users with incomplete records in their medical records were excluded.

Data were collected from electronic medical records from August 2021 to August 2023. Stratification was performed in chunks; this strategy aims to ensure that the pre-COVID-19 pandemic and pandemic groups are balanced in terms of the number of participants. Thus, the first 20 patients admitted in each month of the periods analyzed were included.

The variables studied were age, sex, race, comorbidities, main reason for seeking the ES, risk of clinical deterioration upon admission, risk stratification (RS) category, main organic system affected upon admission and outcomes (length of hospital stay, discharge, transfer, evasion or death).

The risk of clinical deterioration was assessed using the Modified Early Warning Score (MEWS). The MEWS is a score derived from the following clinical parameters: heart rate; respiratory rate; temperature; systolic blood pressure; and level of consciousness. A total score is generated by adding the scores assigned to each parameter, and if the result is between 0 and 2, the tool indicates low clinical severity. If it is 3 to 4 points, it is suggestive of intermediate clinical severity. For health conditions that result in a score

equal to or greater than 5 in this score, there will be a severe clinical condition, therefore associated with an increased risk of death as well as a greater need for admission to the ICU or Intensive Coronary Care Unit.[13]

The risk category at admission was collected through the RS protocol used at HSP, which is institutional and based on the Ministry of Health guidelines. The instrument consists of five categories, indicated by colors, which are correlated to the waiting time for medical care according to clinical severity: red (immediate care); orange (10 minutes); yellow (1 hour); green (2 hours); blue (4 hours).[14–15]

The data were stored in a Microsoft Office Excel® version 2003 spreadsheet. Descriptive analysis of continuous variables was performed using mean, standard deviation, median, minimum and maximum. Categorical variables were presented in absolute and relative frequencies. The association of numerical variables between groups was performed using Student's t-test and Mann-Whitney test, and in the case of categorical variables, the chi-square test, likelihood ratio test and McNemar test. The significance level was set at 95% ($p < 0.05$).

The study was approved by the UNIFESP Research Ethics Committee, under Protocol 60833421.1.0000.5505, on November 18, 2022, and the research was conducted in accordance with the required ethical standards (Resolutions 466/2012, 510/2016 and 580/2018 of the Brazilian National Health Council).

Results

A total of 520 patients were included, with 260 in each group (pre-pandemic and pandemic); the mean age, sex, race, and length of hospital stay between samples were similar. Furthermore, it was noted that users, during the pandemic, had a higher percentage of emergency room visits; however, in the pre-pandemic period, there was a higher percentage of ICU admissions. Regarding the outcomes, the pandemic group had a higher discharge rate, while patients in the pre-pandemic period had more deaths (Table 1).

Table 1 – Demographic characterization of patients (n=520)

Variables	Period		
	Pre-pandemic n (%)	**Pandemic n (%)**	**p-value**
Age			
Mean (SD*)	56.66 (±18.86)	54.44 (±19.26)	0.1843*
Sex			
Male	144 (55.4)	148 (56.9)	0.7237†
Female	116 (44.6)	112 (43.1)	
Race			
White	154 (59.5)	156 (60.2)	0.3671‡
Black	29 (11.2)	21 (8.1)	
Brown	71 (27.4)	80 (30.9)	
Yellow/indigenous	5 (1.9)	2 (0.8)	
Units			
Hospitalization	130 (50)	132 (50.8)	0.0237†
Emergency	95 (36.5)	111 (42.7)	
Intensive Care Unit	35 (13.5)	17 (6.5)	
Mean length of stay (SD*)	10.18 (±12.5)	8.63 (±15.11)	0.2008
Outcomes			
High	210 (80.8)	234 (90)	0.0117†
Transfer/evasion	7 (2.7)	4 (1.5)	
Death	43(16.5)	22 (8.5)	

Note: *SD - standard deviation; †chi-square test; ‡likelihood ratio test

There was no significant difference between the pre-pandemic and pandemic groups regarding clinical variables (Table 2). The same occurred in relation to the involvement of organic systems. In both periods, the most affected system was the digestive system, with 16.2% in the pre-pandemic group and 23.5% in the pandemic group, followed by the cardiological system, with 14.6%, and respiratory system, with 13.5% in the pre-pandemic sample and 14.6% in the pandemic sample. Subsequently, in fourth and fifth place, respectively, were the neurological system (12.3% in the pre-pandemic group and 13.8% in the pandemic group) and musculoskeletal system (9.2% in the pre-pandemic group and 8.5% in the pandemic group).

Table 2 – Comparison of clinical variables between pre-pandemic and pandemic groups (n=520)

	Period		
Variables	**Pre-pandemic n(%)**	**Pandemic n(%)**	**p-value**
Level of consciousness			
Alert	26 (86.9)	223 (85.8)	
Responds to voice	23 (8.8)	30 (11.5)	0.2772†
Responds to pain	5 (1.9)	1 (0.4)	
Unresponsive	6 (2.3)	6 (2.3)	
Heart rate - mean (+SD*)	93.53(23.74)	93.26 (22.24)	0.8954
Systolic blood pressure - mean (+SD*)	127.95 (26.65)	130.03 (29.17)	0.3971
Respiratory rate - mean (+SD*)	19.83 (5.97)	19.61 (5.25)	0.6624
Temperature - mean (+SD*)	36.45 (1.03)	36.41 (0.96)	0.6605
Risk stratification			
Yellow	89 (34.2)	113 (43.5)	
Orange	57 (21.9)	57 (21.9)	0.1071‡
Red	71 (27.3)	52 (20.0)	
Green/blue	43 (16.5)	38 (14.6)	
Modified Early Warning System			
Low risk	146 (56.2)	144 (55.4)	0.8490‡
Moderate risk	49 (18.8)	54 (20.8)	
High risk	65 (25.0)	62 (23.8)	
Comorbidities			
None	35 (13.5)	37 (14.2)	
1 to 2	128 (49.2)	113 (43.5)	0.5438†
3 to 4	49 (18.8)	60 (23.1)	
> 5	48 (18.5)	50 (19.2)	

Note: *SD- standard deviation †likelihood ratio test ‡chi-square test

Discussion

The profile of patients in the pre- and pandemic groups was similar in terms of mean age, sex, race, and length of hospital stay. Unlike the study conducted in a private hospital in São Paulo, when comparing 2020 with 2019 and 2018, there was an increase in the mean age during the pandemic. Individuals under 16 years of age had fewer visits to the emergency room for conditions unrelated to COVID-19, while those aged 60 to 69 had the highest number of visits. Regarding sex, females were the most prevalent, unlike the results of this study, in which males were the most prevalent.[16]

In both periods analyzed, the most prevalent RS was yellow, indicating moderate clinical urgency with a waiting time of up to 1 hour, in addition to one or two comorbidities being predominant in clinical history. Furthermore, according to a retrospective analysis carried out in a tertiary reference hospital in Brazil, the number of emergency care visits decreased by an average of 52% from 2020 to 2019 and from 2020 to 2018, showing a significant increase in severe cases and a decrease in mild cases, thus evidencing a different scenario when compared to this study.[16]

Concerning hospitalizations, similar studies have shown that, during the pandemic, there was a decrease in the number of non-COVID-19 patients seeking emergency care, as well as hospitalizations, which even increased mortality in cases of neoplasms, cardiovascular and endocrine diseases. This is justified by the epidemiological lockdown and as a response from the population to the warning message regarding the demand for health services. In cases of hospitalization, the mean length of hospitalization was succinct, even for acute conditions, as demonstrated in a study carried out in National Health Service (NHS) referral hospitals in England, with patients with coronary syndrome.[17-19]

In the pre-pandemic group, there were more patients admitted to the ICU, whereas in the pandemic group the scenario was different, with more users being treated in emergency units. It can be inferred that there was a reservation of ICU beds for demands related to COVID-19. A study carried out with the objective of identifying the lines of action implemented by federal university hospitals as part of the pandemic contingency plan demonstrated that university hospitals were the main entry point for

severe cases of COVID-19, requiring: organization of specific units for COVID-19; increase in the number of beds; acquisition of personal protective equipment and supplies; development of protocols; and continuing education and hiring of professionals.[1]

As for MEWS, there was no difference between the two periods, with a higher proportion of patients at low and moderate risk of clinical deterioration. Contrary to these findings, another study conducted in the emergency department of a private general hospital specializing in cardiovascular care found that users who sought the service had more complex demands and greater clinical deterioration.[9]

Furthermore, the main complication of COVID-19 is acute respiratory failure. Therefore, the degree of hypoxemia is related to poor prognosis. The MEWS does not include the "oxygen saturation" variable, limiting its performance, which may explain the similarity found between the groups not only in the scores, but in each variable. As for respiratory rate, it was expected that this variable would increase the MEWS score in the pandemic group; however, there was similarity in the results between groups. Respiratory rate counting is the vital sign most susceptible to being withheld, estimated or falsely recorded.[20–22]

When assessing outcomes, the pandemic group had more hospital discharges compared to the pre-pandemic group, in which there were more deaths recorded. A study carried out in the city of Belo Horizonte, Minas Gerais, which assessed the number of cardiorespiratory arrests attended to by the Mobile Emergency Care Service, in the period before the pandemic and during the pandemic, found a 33% increase in cases of deaths at home, regardless of the cause, with the majority being related to cardiovascular comorbidities. This high rate of deaths at home may demonstrate that patients with other diseases did not seek hospital care for fear of infection by COVID-19. In this context, future emergency units will face greater challenges regarding the maintenance of clinical monitoring of chronic diseases.[23]

In view of this, health education has proven to be an ally in the early recognition of signs of clinical decline in patients with previous chronic diseases and in identifying when to seek specialized services. In addition to this, the adoption of preventive measures and self-management of care are related to lower morbidity and mortality rates. [24]

Furthermore, a retrospective analysis carried out in ES at 186 hospitals in the USA found that the capacity for care was lower in 2020 when compared to the same period in 2019, indicating a drop in the volume of visits, in addition to revealing an increase in mortality, verifying the hypothesis that, as the volume of patients in emergency care decreases, the mortality rate increases.[25]

The limitation of this study was that it was carried out in a single center, with a lack of data automation and recording of variables that were difficult to access immediately, making it necessary to search for parameters in the notes relating to the first 24 hours after entering the service.

This study contributes to clinical practice as it emphasizes the importance of seeking hospital services when there is clinical deterioration, especially in cases where there are previously underlying chronic diseases, which require continuous and committed management of the therapeutic plan, even in the face of adversities, such as those imposed by the pandemic. Therefore, it is essential to emphasize the need to develop an action plan and screen these conditions in future large-scale public health events, in order to ensure care for all users with chronic conditions and prevent the worsening of their clinical condition.

Conclusion

There were more ICU admissions and more deaths in the pre-pandemic group, in addition to more hospitalizations in ES in the pandemic group, with more discharges. These findings, despite the similarity between samples, reflect the need for public policies that encourage health education for self-management of chronic health conditions, improving individuals' quality of life and reducing morbidity and mortality associated with these diseases. Planning should include screening protocols, regular monitoring, and personalized interventions, ensuring that all individuals with chronic conditions receive appropriate care. This will not only help prevent the worsening of clinical conditions, but also mitigate the impact of health crises on this vulnerable population, thus ensuring a more effective and equitable response to future health challenges.

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Authorship contribution

1 – Tainá Bustamante Sanches Martos
Corresponding author
Nurse, Undergraduate Degree – sanches.taina@unifesp.br
Research conception and/or development and/or manuscript writing

2 – Luiz Humberto Vieri Piacezzi
Nurse, Master's Degree – piacezzi@unifesp.br
Research conception and/or development and/or manuscript writing

3 – Karina Aparecida Lopes da Costa
Nurse, Master's Degree – karina.costa@unifesp.br
Research conception and/or development and/or manuscript writing

4 – Maria Carolina Barbosa Teixeira Lopes
Nurse, Doctoral Degree – lopes.carolina@unifesp.br
Research conception and/or development and/or manuscript writing; Review and approval of the final version

5 – Ruth Ester Assayag Batista
Nurse, Post-doctoral Degree – ruth.ester@unifesp.br
Research conception and/or development and/or manuscript writing; Review and approval of the final version

6 – Cássia Regina Vancini Campanharo
Nurse, Doctoral Degree – cvancini@unifesp.br
Research conception and/or development and/or manuscript writing; Review and approval of the final version

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