Incidence of Intra-Hospital Care Related to Pressure Ulcers and the Influence of the COVID-19 Pandemic in the City of São Paulo, from March to December 2020

ORIGINAL

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Abstract

Background: In Brazil, there is no published article that measures the expense of pressure ulcer for the health system. There are international studies that show that treating a pressure ulcer is significantly more expensive than preventing it. The purpose of this article is to describe the incidence of patients with hospitalization related to pressure ulcers, in the city of São Paulo, in the period of the 1st increase in cases of COVID-19 (March 2020 to December 2020), as well as the related expense with these hospitalizations.

Method and Findings: The study was retrospective, longitudinal, grouped, of the ecological type. Through the TABNET knowledge and public data platform, detailed data on the AIH were selected - by place of hospitalization - São Paulo, in the main procedure field, using the selection of the municipality of São Paulo in the platform line. Data were also collected from hospitals and from the city of São Paulo, referring to the average number of days of hospitalization and the total value of the AIH.

All values found referred to the SUS code 0415040035 (debridement of ulcer/devitalized tissues). A total of 2,832 cases were found, with an approximate average of 283.2 monthly cases; the month with the lowest incidence was December 2020 with 205 cases and the month with the highest incidence was March 2020 with 405 cases. It means a total expense of 4,238,625.57 with an average value of R\$ 423,862.55.

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Conclusion: There is a high cost related to SUS, with preventable morbidity and cost reduction. We found no tendency for costs to decrease, despite the decrease in incidence.

Keywords

COVID-19, Pressure Ulcers, Health-Care Costs.

Introduction

Pressure ulcers occur due to shear friction of the skin with some surface; especially in those patients with risk factors, such as patients with catabolic metabolic diseases such as decompensated diabetes, poor nutrition, sarcopenia, immobility (by any factor). These factors are frequently seen in intensive care units. Even the material which is in direct contact with the skin, as well as its thermal conductivity can influence the pathophysiology of the ulcer [1].

After the onset of the COVID-19 pandemic, there was an increase in patients in critical states in the units in the city of São Paulo, demanding the creation of new ICU beds and increased use of the prone position [2-4]. It is estimated that 31.1% of patients hospitalized in critical units for COVID developed pressure ulcers requiring daily follow-up, increased hospital costs and increased risk of mortality [5, 6]. Among those who need a prone position, the number of pressure ulcer cases is 57% [7].

The city of São Paulo is the city with the largest flow of people in Brazil and the second largest population in Latin America. São Paulo also has the largest amount of medical and hospital resources in Brazil, as well as being the seat of the Brazilian stock exchange. In addition to having been the gateway to COVID in South America, with first registration on February 28, 2020.

The general treatment for decubitus ulcers in advanced stages is usually surgical debridement [8], requiring multiple approaches until the healthy microbiota of that tissue is recovered [9]. It is known that cold surgical debridement is responsible for stimulating healing through a greater recruitment of fibroblasts and facilitating the re-epithelialization process by reducing the bacteriological load present in the unhealthy tissue [10]. Pressure ulcers that are not adequately treated and in advanced stages can lead to sepsis with a 6-month mortality of approximately 68% [11].

According to a systematic review of fifteen studies on cost-effectiveness in the prevention and treatment of pressure ulcers, it showed that the use of more aggressive procedures, such as surgical debridements, is less costly than the use of human labor for, for example, mobilizing and repositioning patients along with clinical treatment involving specialized dressings when they already have a pressure ulcer [12]. In addition to prevention and non-surgical treatment it is needed continuous training that often will not be reflected even with the use of protocols, with patient care varying a lot even among more experienced professionals [13]. Therefore, prevention is still the best way to reduce costs in the long run [14].

Up to our knowledge, in Brazil there is no published article that measures the expense of this condition for the health system. There are international

studies that demonstrate that the treatment of a pressure ulcer is significantly more expensive than its prevention, so obtaining data on the subject is necessary [15].

Goal

The aim of this article is to describe the incidence of hospitalized patients related to pressure ulcers, in the city of São Paulo, in the period of the 1st increase in cases of COVID-19, in the context of the global pandemic (March 2020 to December 2020), as well as the expense related to these hospitalizations in the same period.

Material and Methods

Through the DATASUS TABNET knowledge and public data platform, detailed data on the AIH were selected - by place of hospitalization - São Paulo, the SUS code 0415040035 (ulcer debridement/devitalized tissue) and 0415040043 (ulcer debridement) was used/necrosis) in the main procedure field and in the procedure field (differentiating each result, however), using the selection of the city of São Paulo in the platform line (code 355030). Data for the period from March 2020 to December 2020 were included.

We studied the data, specifically, from three HC-FMUSP institutions (reference code in TABNET 2078015), a reference hospital that was mobilized for COVID, during the critical period of the pandemic, it is reiterated that it was not considered other hospitals that are part of the HC hospital complex, such as InCor and ICESP, using the TABNET code referring to the Central Institute of HC-FMUSP; Hospital São Paulo from UNIFESP (reference code in TABNET 2077485), hospital that has an open door to the emergency room and Hospital Santa Marcelina de Itaquera (reference code in tab-net 2077477), a hospital that was transformed into care for COVID, however he did not fully close his emergency room service.

Data were also collected from these hospitals and from the city of São Paulo, referring to the average number of days of hospitalization and the total value of the AIH.

The study was retrospective, longitudinal, grouped, of the ecological type. The amounts described herein were described based on the Real, Brazilian currency. The Real in 2020 had an average annual financial value equivalent to U\$0.1939 [16].

Results

All values found referred to the SUS code 0415040035 (debridement of ulcer/devitalized tissues). There were no cases or data referring to the SUS code 0415040043 (debridement of ulcers/necrosis) during the study period.

A total of 2,832 cases were found, with an approximate average of 283.2 monthly cases; the month with the lowest incidence was December 2020 with 205 cases and the month with the highest incidence was March 2020 with 405 cases. With a total expense of 4,238,625.57 with an average value of R\$ 423,862.55; the amount of BRL 556,421.25 being the maximum amount spent in a month, occurred in September 2020. In May 2020, the amount of BRL 320,428.36 was found, which was the minimum monthly amount spent in the period of study. An average amount spent per patient during the study period of R\$ 1496.68

It is noticed that the city of São Paulo showed a decrease in the number of AIH related to the code studied, with a slight recovery and an increase in the number of cases, in June, which represented the first month of the beginning of the phase progression, release from quarantine. It is also interesting to note that expenses related to the procedure, on the contrary, remained at proportionally higher values.

It was found a total average of accumulated hospitalization days of approximately 8.64 days, with the lowest average of hospitalization days in the

month of July/2020 at 7.3 days. The highest average number of days of hospitalization in the month is 9.9 days. The total number of hospitalization days accumulated was 20,039 days, with the amount spent per day due to hospitalizations for debriding ulcers at R\$211.51.

Over time, the Hospital São Paulo at UNIFESP has always had a low incidence of hospitalized patients for debridement, in the period COVID 2021 (MAR-DEZ) 48 patients were seen, with an average cost per patient of R\$ 1717.50 and one cost of R\$ 192.16 per day of hospitalization. An expense less than the average municipal value in the same period.

In the initial period of the pandemic, the HC-FMUSP showed a drop in the number of hospitalized cases, but from the beginning of the relaxation of measures to restrict trade and traffic, there was a considerable increase in the number of hospitalized cases with the procedure. It is noteworthy that in months such as August, September and December, the number of patients assisted by the HC-FMUSP represented 17.37%, 13.74% and 11.7% of the number of patients assisted in the state of São Paulo, respectively. Presenting the amount dispensed per case of R\$20619.82 during the period of this pandemic and a value per hospitalization day of R\$699.70 (a value almost three times higher than the average monthly value in the municipality).

The last hospital studied was Hospital Santa Marcelina, which, unlike other hospitals, kept its incidence stable. From March to December, 287 patients were seen, with an average cost of R\$ 1402.60 per AIH. Also presenting a cost per day of hospitalization of R\$ 249.33.

Discussion

There was no greater number of ulcer debridement procedures in the last year, despite the increase in ICU admission rates, worldwide and in Brazil, due to

the COVID-19 epidemic [2, 17]. Some studies have even demonstrated a higher incidence of pressure ulcers in patients with COVID-19 compared to patients without COVID-19 [1]

In fact, it was noticed in this excerpt of the study, a trend towards a decrease in the number of hospitalizations with surgical debridement of ulcers/debrided tissues. This trend is in disagreement with that described in the literature, where there is a trend towards an increase in the number of cases of ulcers in recent years [18, 19].

Regarding costs, the United States of America spends about 17.8 billion dollars per year on the treatment of ulcers [18]. Increasing the value of hospitalization by an average of 19,300 dollars and increasing the average length of stay by 4 days [20]. On the other hand, the National Health Service (health system with universal principles similar to the Brazilian one) has an expense ranging from £1,214 for type 1 ulcers to £14,108 for type 4 ulcers, according to the Braden international scale [19]. Comparatively, the average expense found was R\$ 1496.68 per case and R\$ 208.70 per day of hospitalization; values lower than those found in these countries.

It was noticed that the city of São Paulo had a decrease in incidence along with the start of measures to restrict mobility and trade, despite the hospitals being more crowded, as are the Intensive Care Units. The fact that this occupation is not seen in the MS data can be inferred through several hypotheses: one is that cases were underreported, either because the procedure was not performed in the operating room, exhaustion of human resources or lack of notification proper. Another alternative is that there was a pent-up demand, due to the lack of hospital beds for patients to perform these procedures.

Regarding costs, as already seen, even the HC-FMUSP, which had the highest cost per service and per day, in the period, has an expense that, in absolute numbers, is lower than that of first-world

countries like England [19]. It is also inferred that hospitals with greater resources tend to use these inputs, infrastructure and labor, which increase expenditure. For example, vacuum therapy in the dressing of patients undergoing surgical clearance is well described as an adjunct to treatment but not widely available in secondary and primary hospitals, unlike the tertiary hospitals studied here [21].

It is also known that patients with longer hospital stays in intensive care beds tend to spend more. COVID, in particular, had longer hospital stays, so hospitals that had their beds and emergency rooms exclusively for this type of demand would tend to have higher expenses. This hypothesis is verified in the study where Hospital São Paulo and Hospital Santa Marcellina, which, despite being tertiary references in the city, spent less per case and per day than HC-FMUSP (only one of the three hospitals studied that had its Emergency Room intended for covid, exclusive service).

As limitations of the study, there is no specific AIH only for procedures performed on pressure and/or decubitus ulcers, which are grouped in the ulcer debridement macrogroup. In addition, as this is a study based on data obtained through filling in SUS documents, the values may be underestimated in patients who present more than one possible code for filling in the hospital admission authorization (AIH).

An underreporting of cases of pressure ulcers is inferred, notably visible after the increase in the number of admissions to the ICU in the last year, with no impact on the incidence of cases of ulcers. Thus, more studies in this area are needed with greater methodological control of confounding variables, to reduce costs and optimize treatment, given the methodological limitation of this ecological study.

Conclusion

There is a high cost related to SUS, with preventable morbidity and cost reduction. We found no tendency for costs to decrease, despite the decrease in incidence.

Financing & Conflict of Interest

No funding was requested for this study.

Authors have no conflicts of interest.

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