Impact of the covid-19 pandemic on the diagnosis and treatment of malignant neoplasms in uterine cervical cancer: a brazilian retrospective study

Impacto da pandemia do covid-19 no diagnóstico e tratamento do câncer de colo de útero: um estudo retrospectivo brasileiro

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ABSTRACT: Introduction: The Covid-19 pandemic has represented a crisis in healthcare systems. The impact of its effects on the diagnosis and treatment of incident malignancies, such as cervical cancer, can be evidenced in metrics. **Materials and methods:** In this cohort, we carried out a retrospective and quantitative comparative analysis of time series, between 2014 and 2022, with the total data of diagnoses and hysterectomies performed for the treatment of malignant cervical neoplasms, through the Department of Informatics of the Unified Health System (DATASUS). **Results:** From 2014 to 2022, Brazil recorded 173,300 cases of malignant cervical neoplasms. Increasing trends in the number of annual diagnoses were examined, with a decrease in the pattern between 2019 and 2020, coinciding with the pandemic period. Similarly, the total number of hysterectomies, the main treatment for cervical cancer, was affected. Between 2014 and 2019, an average of 53,652 surgeries were performed annually. However, in 2020 it fell to 30,698 (40.2%) interventions compared to 2019. **Conclusion:** In the period from 2019 to 2020, there were substantial reductions in the number of procedures coinciding with the COVID-19 pandemic. Consequently, the data suggest a delay in the diagnosis and surgical treatment of cervical neoplasms, impacting relevant clinical outcomes and overall survival.

KEY WORDS: Uterine Cervical Neoplasms; Hysterectomy; Covid-19.

RESUMO: Introdução: A pandemia do Covid-19 representou uma crise nos sistemas de saúde. O impacto dos seus efeitos no diagnóstico e tratamento de doenças malignas incidentes, como o cancro do colo do útero, pode ser evidenciado em métricas. **Materiais e métodos**: Nesta coorte, foi realizada uma análise comparativa retrospectiva e quantitativa de séries temporais, entre 2014 e 2022, com os dados totais de diagnósticos e histerectomias realizadas para tratamento de neoplasias cervicais malignas, por meio do Departamento de Informática da Sistema Único de Saúde (DATASUS). **Resultados**: De 2014 a 2022, o Brasil registrou 173.300 casos de neoplasias cervicais malignas. Foram examinadas tendências crescentes no número de diagnósticos anuais, com diminuição do padrão entre 2019 e 2020, coincidindo com o período pandêmico. Da mesma forma, o número total de histerectomias, principal tratamento para o cancro do colo do útero, foi afetado. Entre 2014 e 2019, foram realizadas em média 53.652 cirurgias anualmente. Contudo, em 2020 caiu para 30.698 (40,2%) intervenções comparado a 2019. **Conclusão**: No período de 2019 a 2020, ocorreram reduções substanciais no número de procedimentos coincidentes com a pandemia da COVID-19. Consequentemente, os dados sugerem atraso no diagnóstico e tratamento cirúrgico das neoplasias cervicais, impactando resultados clínicos relevantes e sobrevida global.

PALAVRAS-CHAVE: Neoplasia cervical uterina; Histerectomia; Covid-19.

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INTRODUCTION

The beginning of 2020 was marked by the onset of the COVID-19 pandemic, which had an impact on health globally. It meant significant restrictions in other words, all nations experienced contact restrictions, an increase in the number of deaths, overcrowded hospitals, and, above all, a reallocation of resources destined for health to combat and treat the coronavirus[1]. As a result, due to the accelerated degree of dissemination of the disease, there was a considerable decrease in health services aimed at other non-transmissible and non-emergency pathologies, such as malignant neoplasms.

Among the non-emergency services, the diagnosis and screening of cervical cancer stand out as crucial. Cervical cancer is the third most common type of cancer among women, with approximately 16,000 new cases reported each year during the three-year period from 2020 to 2022[1]. This malignant neoplasm predominantly affects women with multiple partners, a history of sexually transmitted infections such as Human Papilloma Virus (HPV) infection, and early onset of sexual activity[2]. Therefore, any shifts in public health policies can have a direct impact on the outcomes of cervical cancer.

Due to the high incidence of new cases of cervical cancer, which also has been associated to dismal prognosis since in 2020 the index adjusted for the world population was 4.60 deaths/100 thousand women (INCA, 2020)[3] , it is carried out in the country the early detection of cervical cancer or precursor lesions through cytopathological examination of the uterine cervix, known as Papanicolaou. This exam is intended for females aged between 25 and 64 years and who are sexually active, being a measure that aims to identify a pathological process in a person who has not yet presented symptoms of the disease, in other words, in the early stages[2].

However, due to the global panel provoked by SARS-CoV-2, many of these preventive measures were neglected, with a reduction in the frequency and regularity of the exam, among explanation of the impact over cervical malignancies, it's highlighted the because the financial and health professional resources were allocated to combating COVID-19. With this, it is worth highlighting the damages of the late diagnosis of this pathology which presents a slow and silent in this initial stages[2] and, in more advanced stages of the disease can compromise the obstetric future of the patient, due to the need for conization (procedure to remove part of the cervix uterus) and hysterectomy (surgical removal of the uterus)[1].

OBJECTIVES

The objective of the study was to evaluate the impact of the COVID-19 pandemic on diagnosis and treatment of cervical cancer in Brazil. So, the number of new cases and hysterectomies as surgical approach of cervical malignancies, the main method of treating this malignant neoplasm, were compared in the period from 2014 to 2022, an interval that comprises the moments before, during and the most severe waves or most importance peaks.

METHODS

A quantitative retrospective time-series analysis of the number of diagnosis and total hysterectomies performed for treatment of malignant cervical neoplasms was designed. Data collection was obtained through the Department of Informatics of the Unified Health System (DATASUS), for the period from 2014 to 2022. Having as focus for comparative study, the statistical analysis of the period from 2019 to 2022 was used to compare between pre-pandemic COVID-19. The comparative analysis was mainly carried out using the MatLab software, applying arithmetic mean to the collected data. The analysis was represented in box-plot graphs, created in the MATLAB software. This type of graphical representation aims to depict the maximum and minimum values, the mean, and the percentiles of each studied historical series. In addition, other data were represented in line graphs.

RESULTS

Between 2014 and 2022, there were 173,300 new diagnoses of cervical cancer in Brazil. By analyzing the data, a pattern of increasing diagnoses is observed each year, which, however, is disrupted between 2019 and 2020 when a decrease in the number of diagnoses performed by the Brazilian public health system is observed (Figure 1), reflecting the impact of the COVID-19 pandemic.

Furthermore, it is observed that the drop reported between the years 2019 and 2020 is not limited only to the average data, but is also present in all months of 2020 (Figure 1).

In 2021, there was a small increase in diagnoses, approximately 2.9% compared to the previous year, reaching 23,111 new cases (Figure 1). Furthermore, there is a decrease of only 5 total hysterectomies between the years 2019 and 2021, however, when analyzing the data in detail, it is observed that, in 2021, the maximum and minimum values were always lower than the same parameters of 2019.

In 2022, there was a significant growth in the number of diagnoses, representing a 13.2% increase compared to 2021, reaching a milestone of 26,177 new cases (Figure 1). This can be explained by the fact that many procedures that were previously halted due to the peak of the pandemic in 2020 and 2021 were reassumed in 2022, leading to the identification of new cases that were

not previously diagnosed.

The impact of the COVID-19 pandemic was not limited to diagnostic procedures but also affected the treatment of women affected by malignant neoplasms of the cervix, as the number of total hysterectomies, the primary method of treatment for patients with early-stage cervical cancer[4], was impacted.
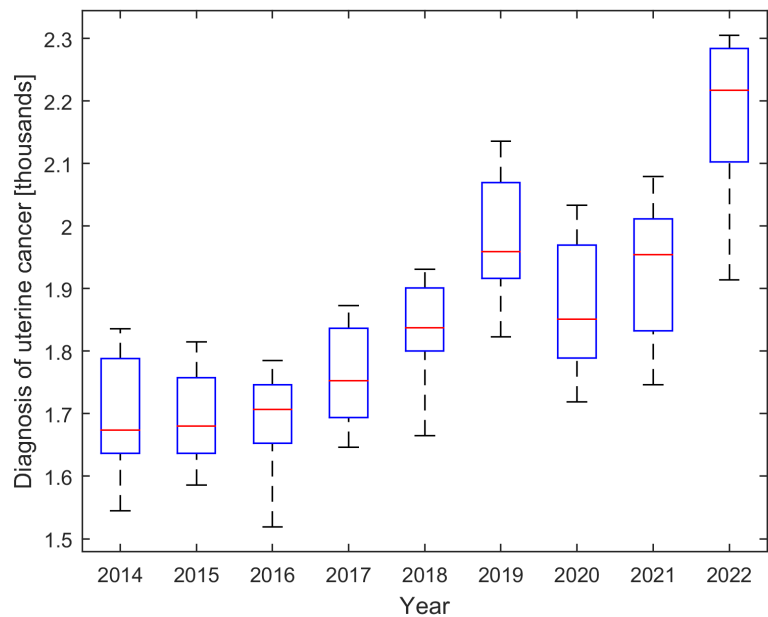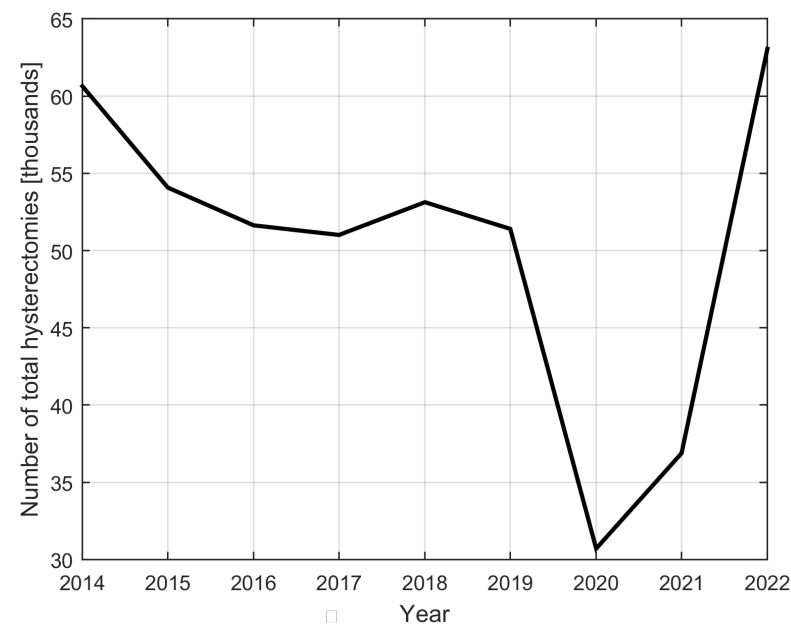
Figure 1

Figure 2

This is evidenced by the fact that between 2014 and 2019, the arithmetic mean of the number of surgeries performed was 53,652 surgeries per year. In 2020, a decrease of 40.2% in the number of total hysterectomies performed compared to 2019 can be observed, with only 30,698 procedures being carried out in absolute numbers (Figure 2).

This trend continued in 2021 when the number of total hysterectomies performed by the Brazilian public health system was 36,889, an increase of 20.2% compared to 2020, but still significantly lower than the average achieved in previous years (Figure 2).

In 2022, a period of gradual return of activities in Brazil, there was a sharp increase in the number of total hysterectomies performed by the Brazilian public health system, approximately 70.9% compared to 2021, reaching a total of 63,049 total hysterectomies performed (Figure 2). This can be explained by the fact that many diagnostic procedures that were prevented from being performed in 2020 and 2021 were resumed in 2022.

DISCUSSION

During the COVID-19 pandemic, procedures aimed at other pathologies, especially non-communicable ones, such as malignant neoplasms, were considerably reduced due to the great impact caused by the virus on the Brazilian health system. In the context of the COVID-19 crisis, diagnostic procedures and elective surgical procedures for treatment, such as partial or total hysterectomy, had to be postponed, especially in periods of higher incidence of infection by the Sars-CoV virus.

Based on our data, it is evident that the pandemic period had a significant impact on the early diagnosis and prognosis of cervical cancer. The findings suggest that the pandemic led to a decrease in the early detection of cervical cancer, thereby affecting the prognosis for women with this type of neoplasm.

Furthermore, our data revealed a decline in the performance of hysterectomy, the primary treatment for malignant neoplasms, particularly during the peak of the COVID-19 infection between 2020 and 2021. This decline may have resulted in fewer cases receiving surgical treatment alone, necessitating additional pharmacological and/or radiological interventions due to advancements in the TNM staging of cervical cancer.

We thus highlight the relevance of our study in the context presented, so that it tends to be the first that analyzes the impact of the COVID-19 pandemic on cervical cancer, from such perspectives. However, it is extremely important to highlight the limitations of the present study, since patients affected by such neoplasm are not always submitted to hysterectomy and this procedure is not always intended for the treatment of uterine cancer.

To further investigate and confirm the hypothesis raised, additional studies are required to assess the impact of the pandemic on the treatment of uterine cervical malignant neoplasms. These studies should examine the effects on neoplasm staging at the time of diagnosis, the treatments employed, and patient survival rates, and ultimately evaluate the prognosis of patients whose diagnosis and/ or treatment were affected by the strain on the healthcare system caused by the pandemic.

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