


# The impact of the Covid-19 pandemic on a reference oral medicine service in Brazil

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## Abstract:

The COVID-19 pandemic in 2020 had a global impact on healthcare services, leading to a decrease and delay in diagnosing various diseases and initiating treatment. Dentistry was quickly recognized as a high-risk area for contamination, resulting in a reduction in the number of consultations conducted. The objective of this study was to identify the main characteristics of consultations at the Oral Medicine Outpatient Clinic from our institution, comparing the number of consultations and diagnoses performed during regular years from 2016 to 2019 with the years of the COVID-19 pandemic. **Materials and Methods:** Data were collected and analyzed from clinical records of all patients seen at the Oral Medicine Outpatient Clinic from March 2016 to May 2021. Sociodemographic data and the diagnosis established for these patients were collected. In the pre-pandemic period, an average of 324 patients per year were treated. In the pandemic period average was 248.5 per year, indicating a 23.3% reduction in the number of patients treated at the service. When comparing the number and overall percentage of diagnosis established, a higher number of malignant neoplasms were identified during the pandemic, despite the reduction in services provided. Thus, we conclude that the COVID-19 pandemic had a negative impact on the total number of new patients admitted to our service but we were able to continue diagnosing cases of malignant neoplasms. This reinforces the importance of maintaining the service, considered essential to the population, during this critical period we have gone through.

**Keywords:** COVID-19, oral medicine, mouth neoplasms, diagnosis

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## INTRODUCTION

At the end of December 2019, numerous cases of acute pneumonia emerged in the city of Wuhan, China, which were later identified as being caused by a novel coronavirus called SARS-CoV-2<sup>1</sup>. The new disease was subsequently named COVID-19<sup>2</sup>. In March 2020, the World Health Organization declared the outbreak of this new disease a pandemic. The pandemic had a significant impact on various sectors of society worldwide, including health systems, which had to suspend essential care in order to mitigate the spread of the virus<sup>3</sup>. As a result, public health control measures such as social distancing and mandatory use of personal protective equipment (PPE) were implemented, presenting new challenges for patients and healthcare professionals<sup>4</sup>.

Dental practice was considered a high-risk activity due to the generation of aerosols and droplets during patient care<sup>5,6</sup>. In Brazil, during the pandemic, dental care was limited to emergencies and urgent cases, following the recommendations of the Federal Council of Dentistry and the National Health Surveillance Agency.

Oral medicine, also known as Stomatology, is a dental specialty that focuses on the diagnosis and treatment of oral diseases, including the majority of oral malignant neoplasms diagnosed in our country. In Brazil, this specialty is relatively new and is predominantly practiced in dental schools and teaching hospitals<sup>7</sup>. However, due to the pandemic, most Oral medicine services ceased their operations, potentially leading to delays in the diagnosis of oral lesions, which could have a negative impact on the patient's prognosis<sup>8</sup>.

The objective of this study was to assess the impact of the COVID-19 pandemic on the provision of care at a specialized Oral medicine service in Brazil.

## MATERIAL AND METHODS

This was a cross-sectional retrospective study that received approval from the Ethics Committee for Research Involving Human Beings (CAAE: 51479321.1.0000.5231). The medical records from 2016 to 2021 were reviewed to collect clinicodemographic data, including age, gender, and diagnosis. Diagnoses were classified based on etiological factors as follows: reactive lesions, benign neoplasms, malignant neoplasms, potentially malignant disorders, infectious diseases, developmental disorders, cysts, or immune-mediated diseases. The data were transferred to an Excel spreadsheet, and a descriptive analysis was conducted, comparing the

pre-pandemic period, encompassed the years 2016 to 2019, to the pandemic period, covered 2020 and 2021.

## RESULTS

During the study period from 2016 to 2021, a total of 1793 patients received treatment at the Oral Medicine outpatient clinic from Universidade Estadual de Londrina. The majority of patients were female, accounting for 64.25% of the total. The mean age of patients was 51.92 years, ranging from 1 to 99 years. In terms of diagnosis, the most common cases were reactive lesions, comprising 626 patients (40.31%). This was followed by potentially malignant disorders (127 - 8.18%), infectious diseases (123 - 7.92%), benign neoplasms (121 - 7.79%), malignant neoplasms (94 - 6.05%), developmental disorders (90 - 5.80%), cysts (52 - 3.35%), and immune-mediated diseases (26 - 1.67%).

An annual analysis revealed that in 2016, a total of 216 patients were admitted with a mean age of 51.37 years, ranging from 5 to 86 years. Among them, 135 were female (62.50%) and 81 were male (37.50%). The most common diagnosis in that year continued to be reactive lesions, with 80 patients (40.0%). This was followed by benign neoplasms (20 - 10.0%), potentially malignant disorders (19 - 9.50%), infectious diseases (14 - 7.0%), developmental alterations (10 - 5.0%), and cysts and malignant neoplasms, with equal distribution (7 - 3.50%), and immune-mediated diseases (4 - 2.0%).

In 2017, a total of 342 patients were treated, with a mean age of 51.02 years, ranging from 1 to 99 years. Among them, 216 were female (63.16%) and 126 were male (36.84%). The predominant diagnosis in 2017 remained reactive lesions, accounting for 126 patients (46.84%). This was followed by benign neoplasms (30 - 11.15%), infectious diseases and potentially malignant disorders, with equal distribution (20 - 7.43%), malignant neoplasms (14 - 5.20%), developmental alterations (11 - 4.09%), cysts and immunologically mediated diseases, with equal distribution (6 - 2.23%).

In 2018, a total of 406 new patients received treatment, with a mean age of 51.26 years, ranging from 2 to 90 years. Among them, 271 were female (66.75%) and 135 were male (33.25%). Reactive lesions continued to be the most common diagnosis in 2018, with 133 patients (37.78%). This was followed by benign neoplasms (36 - 10.23%), infectious diseases (34 - 9.66%), potentially malignant disorders (28 - 7.95%), developmental disorders (21 - 5.97%), malignant neoplasms (20 - 5.68%), cysts (11 - 3.13%), and immune-mediated diseases (2 - 0.57%).

A total of 332 patients were seen in 2019, with a mean age of 52.77 years, ranging from 3 to 94 years. The majority were female (211 – 63.55%), while 121 were male (36.45%). In terms of diagnosis in 2019, there was a prevalence of reactional lesions, with a total of 127 patients (41.23%). Additionally, there were cases of potentially malignant disorders (26 – 8.44%), developmental disorders (24 – 7.79%), infectious diseases (22 – 7.14%), benign neoplasms (19 – 6.17%), cysts (13 – 4.22%), malignant neoplasms (12 – 3.90%), and immune-mediated diseases (3 – 0.97%).

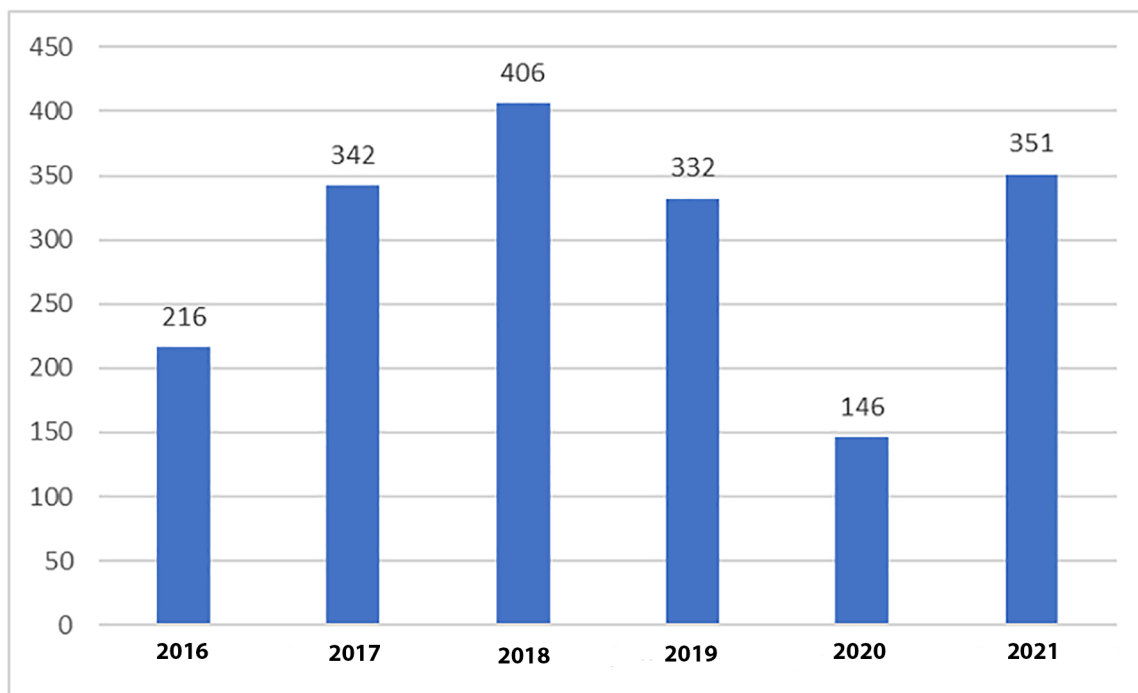
In 2020, 146 patients were treated, with a mean age of 50.86 years, ranging from 2 to 93 years. The majority were female (92 – 63.01%), while 54 were male (36.99%). In 2020, the year the pandemic began, the prevalence of diagnosis remained with reactional lesions as the most common, with a total of 41 patients (32.80%). Furthermore, there were cases of malignant neoplasms (13 – 10.40%), potentially malignant disorders and developmental disorders (8 – 6.40%), infectious diseases (7 – 5.60%), cysts and immunologically mediated diseases (4 – 3.20%), and benign neoplasms (3 – 2.40%).

Finally, in 2021, 351 patients were treated, with an average age of 53.56 years, ranging from 5 to 94 years. The majority were female (227 – 64.67%), while 124 were male (35.33%). Even in a pandemic scenario, the prevalence of diagnosis remained with reactional lesions,

with a total of 119 patients (39.80%). Additionally, there were cases of malignant neoplasms (28 – 9.36%), potentially malignant disorders and infectious diseases (26 – 8.70%), developmental disorders (16 – 5.35%), benign neoplasms (13 – 4.35%), cysts (11 – 3.68%), and immune-mediated diseases (7 – 2.34%).

In the pre-pandemic period, which corresponds to 2016 to 2019, 1296 patients were treated, with an average of 324 patients per year. In the pandemic period of 2020 and 2021, 497 patients were treated, with an average of 248.5 per year, indicating a 23.3% reduction in the number of patients treated at the service (Graphic 1).

When comparing the pre-pandemic period with the pandemic period, we found that the diagnosis with the highest prevalence in the pre-pandemic period was reactional lesions (466 cases – 35.95% - 116.5/year), followed by benign neoplasms (105 – 8.10% - 26.25/year), potentially malignant disorders (93 cases – 7.17% - 23.25/year), infectious diseases (90 – 6.94% - 22.5/year), developmental disorders (66 – 5.09% - 16.5/year), malignancies (53 – 4.08% - 13.25/year), cysts (37 – 2.85% - 9.25/year), and immune-mediated diseases (15 – 1.15% - 3.75/year). While in the pandemic period, the most prevalent diagnosis was reactional lesions (160 – 32.19% - 80/year), followed by malignant neoplasms (41 – 8.24% - 20.5/year), potentially malignant disorders (34 – 6.84% - 17/year), infectious diseases (33 – 6.63% -



**Graphic 1.** The distribution of the number of new patients admitted to our service per year, from 2016 to 2021.

16.5/year), developmental disorders (24 – 4.82% - 12/year), benign neoplasms (16 – 3.21% - 8/year), cysts (15 – 3.01% - 7.5/year), and immune-mediated diseases (11 – 2.21% - 5.5/year). It is worth noting that the average number and percentage of malignant neoplasms diagnosed during the pandemic was higher than in the pre-pandemic period. (Table 1)

**Table 1.** Diagnoses conducted at our service, comparing the pre-pandemic period (2016 to 2019) with the pandemic period (2020 and 2021), presented as average cases per year and overall percentage.

Classification of diagnosis/period	Pre-pandemic	Pandemic
<b>Reaction Diseases</b>	116.5/year (35.95%)	80.0/year (32.19%)
<b>Benign Neoplasms</b>	26.25/year (8.10%)	8.0/year (3.21%)
<b>Potentially Malignant Disorders</b>	23.25/year (7.17%)	17.0/year (6.84%)
<b>Infectious Diseases</b>	22.5/year (6.94%)	16.5/year (6.63%)
<b>Developmental Disorders</b>	16.5/year (5.09%)	12.0/year (4.82%)
<b>Malignant neoplasms</b>	13.25/year ( <b>4.08%</b> )	20.5/year ( <b>8.24%</b> )
<b>Cysts</b>	9.25/year (2.85%)	7.5/year (3.01%)
<b>Immune-Mediated Diseases</b>	3.75/year (1.15%)	5.5/year (2.21%)

## DISCUSSION

On March 11, 2020, the World Health Organization (WHO) declared the COVID-19 pandemic, characterized as a respiratory infection with the potential to evolve into severe acute respiratory syndrome. Since then, several professional practices have sought to re-adjust work processes in order to reduce the spread of the SARS-CoV-2 virus. The dental field, known for its close professional-patient contact, was quickly identified as an area with a high potential for virus contamination and, therefore, experienced a significant impact. Due to the transmission of COVID-19 through droplets and aerosols, which are inherent features of dental practice, most countries have adopted a strategy of suspending all elective dental services<sup>9</sup>.

The COVID-19 pandemic has also had an impact on the way dentistry is practiced in higher education institutions<sup>10,11</sup>. In February 2020, when the virus began community transmission in the US and Canada, dental teaching institutions had to respond to the rapidly evolving crisis. Elective and routine dental procedures were canceled, prioritizing urgent care to prevent community transmission of COVID-19. Oral surgery procedures were limited to non-aerosol generating procedures in order to reduce the risk of contamination. Specifically, the use of high-speed pens and ultrasonic devices was greatly restricted. The distribution of

personal protective equipment (PPE) to students and employees was centralized and rationed to minimize waste, as there was a risk of material shortage in the coming months. In March 2020, when government authorities implemented physical distancing measures to flatten the infection curve, academic dental higher education institutions adapted accordingly. Initially, all dental care in the teaching clinic environment was suspended for undergraduate and graduate students in dentistry. However, urgent dental appointments continued in order to alleviate the burden on the already strained healthcare system and hospitals<sup>12</sup>. The situation was no different at our institution, where all elective care was suspended from March 20, 2020. Only urgent and emergency care, conducted in the Dental Emergency Department, remained operational, but with restrictions.

In Brazil, the Ministry of Health has established oral healthcare priorities considering the restrictions and challenges posed by the pandemic, with a focus on emergency and urgent situations, including procedures for diagnosing oral cancer. In the initial weeks of the pandemic, the Ministry of Health recommended the suspension of non-essential oral healthcare services while maintaining emergency dental care nationwide.

At our institution, the Oral Medicine outpatient clinic, which serves as a regional referral center in the field and is responsible for a significant number of oral cavity cancer diagnoses in the local population, suspended its services for only one month. As an essential service for the population, it resumed operations with new health protocols that involved reducing the number of patients treated and prioritizing cases with suspected malignancies.

The COVID-19 pandemic has had a significant impact on the diagnosis and treatment of cancer patients worldwide. Patt et al. (2020)<sup>16</sup> documented the effects of the pandemic on cancer care in the United States, including a decrease and delay in diagnosing new cases and a delay in initiating treatment. In the UK, national cancer screening programs, responsible for approximately 5% of annual cancer diagnoses, have been suspended<sup>13</sup>. Countries worldwide have reported a reduced number of cancer diagnoses during the initial period of the COVID-19 pandemic, particularly between March and June 2020<sup>14-16</sup>.

In developing countries, a significant proportion of oral cancer cases are diagnosed at advanced stages, leading to higher morbidity and mortality rates. Early-stage diagnosis, on the other hand, generally results in

a more favorable prognosis<sup>17</sup>. Advanced-stage diagnoses often involve worse histological grading, larger tumor sizes, and cervical involvement, significantly impacting the prognosis<sup>18</sup>.

Oral squamous cell carcinoma, the primary type of cancer affecting the oral cavity, represents a significant global health concern<sup>19</sup>. It is expected that the number of new cases will increase by 65% by 2035, and more concerning is the projection that cases diagnosed in elderly patients ( $\geq 65$  years of age) will double by approximately 104% in the next 20 years<sup>20</sup>. Oral medicine services play a crucial role in early detection of oral cancer<sup>9</sup>. However, due to the pandemic, the diagnosis of malignant and potentially malignant oral lesions may be delayed, leading to a worsened prognosis for patients<sup>8</sup>. In our institution, we observed a decrease in the total number of patients seen during the pandemic year. Nevertheless, we were able to diagnose more cases of malignant neoplasms compared to previous years' averages (20.5 vs. 13.25). This was made possible by the brief period of service suspension, highlighting the importance of maintaining our services throughout the pandemic. Additionally, other healthcare facilities in the region, such as hospitals and basic health units, also experienced reduced capacity for oral cancer care.

Based on the findings of our study, we concluded that the COVID-19 pandemic led to a decrease in new patient admissions at our Oral Medicine Outpatient Clinic. However, by continuing consultations, albeit in a reduced manner, we ensured the ability to diagnose cases of oral cancer during this period, underscoring the significance of our service for the population. The experience gained from navigating through these unprecedented restrictions has prepared us to face similar situations in the future.

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