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Original Article

The lockdown effect: The impact of the COVID-19-related confinement on the nature of dental emergencies and the number of patients seen at the Geneva university hospital's dental clinic

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ABSTRACT

Purpose: The aim of this retrospective case study was to evaluate the impact of the COVID-19 confinement on consultation number and nature of dental emergencies.
Materials and Methods: The investigators implemented a retrospective case-control study and enrolled a sample of patients who presented to the University Hospital of Geneva for dental emergencies during the COVID-19 confinement from March 16 to April 26, 2020. They were compared to a matched case-control group treated in 2018 and 2019. The predictor variable was the COVID-19 confinement. The outcome variables were consultation number and nature of dental emergencies. Other study variables included age, gender, socio-economic status, delay from symptoms to consultation and type of treatment. Descriptive and bivariate statistics were computed and significance level was set at ≤ 0.05.
Results: The study sample was composed of 1104 patients, with 386 in the case-study and 718 in the control group. No significant change in patient numbers was observed. In the case-study group patients were significantly younger (P= 0.004), had a significantly higher proportion of acute toothache and dental infections (P= 0.01), the main reason for consultation was pain or swelling (P= 0.01) and the delay from first symptoms to consultation was shorter compared to the controls (P=0.008).
Conclusion: The COVID-19 confinement had no impact on the consultation number of dental emergencies. However, changes in emergency type were noted, with an increase in acute toothaches and infections and patients waited less time between the onset of symptoms to consultation.

1. Introduction

On the 31st of December 2019, the first clusters of patients presenting with pneumonia of unknown origin began to appear in Wuhan, China [1]. At the start of 2020, the infectious agent was isolated and identified as a novel coronavirus, SARS-CoV-2 [2]. By the end of January 2020, and in light of the rapidly increasing number of infections, the World Health Organization (W.H.O) declared the disease as a public health emergency of international concern [3]. Despite efforts to contain the virus, new cases started to appear in other provinces within China and eventually throughout the world. The number of cases continued to increase and although it was not known at the time, one of the most significant and world-changing events of the 21st century was unfolding [1–3].

When the first case in Switzerland was detected on the 25th February 2020 in the canton of Ticino, the Swiss government acted swiftly [4]. The first country-wide measures to limit the spread of the infection were put in place just three days later. Despite these first steps being taken toward containing the spread of the virus, on the 11th of March 2020, as the situation continued to worsen and, with COVID-19 being declared a pandemic by the W.H.O, stricter measures were taken. Five days later the Swiss Federal Council announced a state of emergency with a country-wide lockdown of six weeks beginning on the 16th March 2020 [5].

As the pandemic continued to develop, the scientific community started taking a great interest in the transmission methods of the novel coronavirus. A clear understanding of transmission routes was crucial to finding effective methods to limit the spread of the disease. The general consensus from these studies was that spread of SARS-CoV19 was through droplets and aerosols [6–8]. It is for this reason that most preventative measures targeted these routes of transmission. In Switzerland high-risk sectors where cross-contamination

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was likely were explicitly targeted by preventative measures. It is well established in the literature that there is a significant increase in the production of droplets and aerosols capable of carrying micro-organisms, viruses and blood during dental treatments, thereby increasing the risk of cross-contamination by transmitting these pathogens to personnel and patients [9–11]. Therefore the dental sector was specifically targeted by the Swiss government's preventative measures.

Starting from Monday 16th March 2020 all elective dental treatments were suspended, and dental professionals were only authorized to treat emergency cases [5]. Non-urgent treatments were defined in the legislation as 'interventions: (a) that can be postponed to a later date without the risk of causing further harm other than minor psychological or physical inconvenience, or (b) treatments that are performed for the sole purpose of improving aesthetics, performance or 'well-being' (art 10a al. 2 O2 COVID-19) [5]. Dental practices were authorized to resume treatment of non-urgent cases starting from the 27th April 2020.

The purpose of this study was to answer the following clinical question: Does the COVID-19-related confinement impact on consultation number and nature of dental emergencies? The authors hypothesized that with the closing of private dental practices for elective procedures, there would be an overflow to the university hospital clinic leading to an increase of consultations. Secondly, with the growing concern of infection by the corona virus there would be a reluctance for the population to seek dental emergency care and therefore would do so only in severe cases and after an extended time from the onset of symptoms.

The specific aims of the study were as follows: 1) to estimate and compare the number of consultations for dental emergencies between patients treated prior and during the COVID-19-related confinement; 2) to estimate and compare demographics, disease's type, reason for consultation, delay from first symptoms to consultation and treatment between the two periods.

2. Materials and methods

2.1. Study design

To address the research purpose, the investigators designed and implemented a retrospective case-control study. This study followed the Declaration of Helsinki and the Ethics Commission of the University Hospitals of Geneva approved the study (Ref.2022-01124).

2.2. Study sample

The study sample was derived from the population of patients who presented to the dental clinic of the department of oral and maxillofacial surgery at the Geneva University Hospital, Switzerland, for evaluation and management of dental emergencies. Patients treated during the COVID-19 confinement period from March 16 to April 26, 2020 provided the case-study group.

The charts of patients who had presented during the same six weeks period in the two preceding years from March 19 to April 29, 2018 and from March 18 to April 28, 2019 were selected from our internal registry for comparison as control group.

Patients were excluded from the study sample if they had incomplete or insufficient data including missing medical records at the time of data collection.

The electronic patient records were used to collect demographics such as age, sex, occupation and clinical data on each patient. All data was stored on REDCap (Research Electronic Data Capture) database, a password-protected, secure data collection and storage web application. Socio-economic vulnerability was assessed using the definition by the Center for Territorial Analysis of Inequalities (CATI) (https://www.ge.ch/document/centre-analyse-territoriale-inegalites-boussole-politiques-proximite-efficaces)

All data was organized for each of the studied periods into categories of disease type and treatment performed. The patient's samples from 2018 and 2019 were grouped together to give more statistical strength for the comparative analysis.

Table 1
Demographics of patients.

	Case-study group (COVID-19 confinement)	Control group (Pre- COVID-19)	*p*
Total number of patients	386	718	
Age (years), mean (SD)	43.2 (18.4)	45.7 (19.3)	0.04
Gender: Male	226 (58.5)	357 (49.7)	0.006
Professional status			0.03
Employed	140 (44.4)	248 (37.7)	
Unemployed	101 (32.1)	201 (30.5)	
Student or child	31 (9.8)	64 (9.7)	
Retired	36 (11.4)	119 (18.1)	
Invalidity	7 (2.2)	26 (4.0)	
Vulnerability score*			0.78
No vulnerability (0)	74 (19.2)	120 (16.7)	
Low (1)	50 (13.0)	97 (13.5)	
Medium (2-3)	80 (20.7)	148 (20.6)	
High (4-6)	182 (47.2)	352 (49.1)	

* Socio-economic vulnerability was assessed using the definition by the Center for Territorial Analysis of Inequalities (CATI) (https://www.ge.ch/document/centre-analyse-territoriale-inegalites-boussole-politiques-proximite-efficaces).

2.3. Study variables

The predictor variable was the COVID-19 confinement. The primary and secondary outcome variables were, respectively, the nature of dental emergencies and the number of patients. Other study variables included age, gender, socio-economic status, delay from first symptoms to consultation and type of treatment.

2.4. Statistical analysis

Descriptive (mean, frequency, range, standard deviation) and bivariate (t-test) statistics were computed with R statistical software (version 4.0.4; R Development Core Team, Vienna, Austria, 2021). Significance level was set at ≤ 0.05.

3. Results

The study sample was composed of 1104 patients, with 386 (35%) in the case-study group and 718 (65%) in the control group. Table 1 lists the demographic characteristics of both groups. No significant change in patient numbers was observed. Subjects in the case-study group were significantly younger (P= 0.004) with a male predominance (P=0.006) and they were more frequently employed and, conversely, less often retired (P=0.003).

Table 2 summarizes the differences between treatment groups with respect to disease's type, reason for consultation and delay from first symptoms to consultation. Patients in the case-study group had significantly higher proportion of acute toothache and dental infections (P= 0.01) and the main reason for consultation was pain or swelling (P= 0.01). Interestingly, the delay from first symptoms to consultation was shorter among case study patients (P=0.008).

Table 3 summarizes the differences between treatment groups with respect to treatments. Overall, the type of treatments performed remained similar prior to and during the confinement, with a similar proportion of antibiotics prescribed and a similar mix of treatments offered.

Table 2
Comparison of the distribution of disease type, reason for consultation and delay from first symptoms to consultation.

	Case-study group (COVID-19 confinement)	Control group (Pre- COVID-19)	*p*
Disease type			
Infections[±]	45 (11.7)	77 (10.7)	0.010
Trauma[a]	38 (9.9)	76 (10.6)	
Acute toothache[b]	236 (61.3)	382 (53.2)	
Prosthetic[c]	31 (8.1)	65 (9.1)	
Other[d]	35 (9.1)	118 (16.4)	
Reason for consultation			
vPain or swelling	314 (81.3)	535 (74.5)	0.01
Broken tooth or obtura-	29 (7.5)	55 (7.7)	1.00
tion	27 (7.0)	72 (10.0)	0.12
Prosthesis	6 (1.6)	15 (2.1)	0.70
Trauma	10 (2.6)	46 (6.4)	0.01
Other[e]			
Delay from first symptoms			0.008
to consultation	54 (18.3)	50 (15.0)	
0–1 day	164 (55.6)	177 (53.2)	
2–6 days	54 (18.3)	63 (18.9)	
1–3 weeks	23 (7.8)	29 (8.7)	
>3 weeks	0 (0)	14 (4.2)	
Not applicable			

Note: [±]Abscess, Cellulitis, Pericoronitis.
[a] Dental trauma, Maxillo-facial Trauma.
[b] Acute periapical periodontitis, Acute pulpitis, Combined endodontic-periodontic lesion, Periodontic lesion.
[c] Broken denture, loose or lost crown/bridge, implant emergencies, Prosthetic stomatitis.
[d] Myofascial pain syndrome, Temporomandibular joint disorders, Oral mucosa lesion (ulcers, trauma, etc. . .).
[e] Caries, non-urgent general check-up.

4. Discussion

The aim of this study was to retrospectively evaluate and compare a series of patients who consulted for dental emergencies over a defined period prior and during the COVID-19 confinement. The author's hypothesis was that during the COVID-19 confinement the consultation number would be increased and that the nature of dental emergencies would be different with a higher rate of severe cases, which consulted after an extended time from the onset of symptoms.

The results of this study showed that during the Covid-19 confinement, no significant change in the number of patients consulting at the emergency dental clinic was observed. On the other side, changes in emergency type were noted, with an increase in acute toothaches and infections, which manifested more often by severe pain and/or swelling. This trend could be explained by the fact that the dental elective procedure including the preventive measures e.g dental check-up, tooth cleaning and scaling were suspended during the COVID-19 confinement. Conversely, the number of oral/dental trauma cases significantly decreased due to the general lockdown restrictions, which strongly reduced high-risk activities and interpersonal violence.

On average, patients waited less time between the onset of symptoms and seeking treatment during the confinement, with more patients waiting 24 hours before presenting to the clinic.

As fear grew within the population following the rise in case numbers of SARS-coV-2 and the uncertainty of the severity of the disease it was then imagined that the number of dental emergency consultations may decrease as people would not want to leave the safety of their own homes. Once again, there was no such shift observed in the weekly trend of consultations.

The mean age of patients in 2020 was lower than in previous years, with a significant reduction in the number of older patients (> 65 years) possibly explained by the perceived risk of the severity of infection in this population. In contrast to previous years, more patients consulting during the confinement were employed. As businesses closed and employees began to work from home, it was easier for this population to take the time out of their schedule to seek dental treatment.

It is important to note that dental treatment in Switzerland is not state funded and generally is not reimbursed by basic insurance cover. There is no difference whether a patient chooses to consult at a private clinic or public institution (such as the Geneva University dental clinic) meaning that patients have total freedom to consult anywhere. This is a possible explanation for our results in terms of no change to absolute number of consultations over the studied period: patients were not funnelled into our service as a result of the closure of the private sector as seen in other publications emerging from China and Italy [12, 13].

An organisational difference exists between the centre in which this study was performed and alternative options (dental practices and clinics) available to the population. No scheduling was possible for dental emergencies and patients were generally seen on a first come, first served basis. In the private sector, emergency appointments were scheduled either online or over the phone. This could possibly explain why patients may have chosen to rather set a fixed appointment rather than wait for an unknown duration.

The observations in this study differ to those found in similar publications which focused on patients in Northern Italy and Beijing, China, respectively [12–13]. In both of these studies a significant increase in consultations was observed during the COVID-19 outbreak as a result of the overflow caused by the closing of private dental practices. Cagetti et al. suggest that the increase in patient numbers seeking urgent dental care was an indirect measure of the ability of the Italian health system to provide sufficient alternatives [12].

The way the dental sector is organized in Switzerland and the way in which the lockdown was handled meant that despite elective procedures being put on hold, emergency care could still be provided by private clinics and practices to patients who needed it. Therefore, no additional pressure was put onto cantonal dental institutions such as the center used for this study.

Table 3
Comparison of the treatments performed.

	Case-study group (COVID-19 confinement)	Control group (Pre- COVID-19)	*p*
Antibiotics	312 (80.8)	564 (78.6)	0.42
Examination only	95 (24.6)	147 (20.5)	0.13
Accident-insurance declaration	3 (0.8)	12 (1.7)	0.34
Abscess incision and drainage	9 (2.3)	18 (2.5)	1.00
Dental extraction	137 (35.5)	230 (32.0)	0.27
Endodontic procedure	38 (9.8)	82 (11.4)	0.48
Temporary filling	17 (4.4)	46 (6.4)	0.22
Prosthetic repair	21 (5.4)	47 (6.5)	0.55
Local therapy[a]	51 (13.2)	100 (13.9)	0.81
Other	15 (3.9)	43 (6.0)	0.18

[a] Treatments such as ultra-sonic scaling, irrigation with antiseptic solutions or disinfection of wounds.

5. Conclusion

The findings of this retrospective monocentric study suggest that the confinement and lock-down measures that took place in Geneva, Switzerland, did not appear to have a significant impact on the behaviour of the patients seeking urgent dental treatment. This finding is a contrast to those found in other countries. With numbers remaining stable, the only significant differences observed were related to the age of the patients which was lower with less retired, elderly, at risk, patients. However, changes in emergency type were

noted, with an increase in acute toothaches and infections and patients waited less time between the onset of symptoms to consultation. Moreover, there was a significant decrease in the number of trauma cases, most likely due to the sudden decrease of high-risk activities and less interpersonal violence.

The scope of this study could be expanded to include data from private practices and clinics in the canton of Geneva, which would allow us to better understand the population's response to the lockdown.

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Declaration of Competing Interests

None

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