

ENT Service during the COVID-19 pandemic: a cross-sectional study in 572 patients.

Nicolas Peigneux¹, Lionel Benchimol¹, Guillaume Bendavid¹, Marie Detroz¹, Chloe Marecaux¹, Laurence Pottier¹, Marc Samaha¹, Philippe Lefebvre¹, and Anne-Lise Poirrier¹

¹Centre hospitalier universitaire de Liege

June 10, 2020

Abstract

Objective: To provide objective data on the impact of COVID-19 crisis on our ENT practice. **Design:** Cross-sectional study. **Setting:** Tertiary referral hospital (1038 inpatients beds). **Participants:** 572 consecutive patients presenting to the ENT clinic and ENT operating theatre from March 16, 2020 to May 3, 2020 were prospectively included. **Main outcome measures:** Demographic and clinical data, admission time, paraclinic testing, management, outcome and follow'up were recorded. Retrospective search for comparison to past year over the same period of time was carried out. **Results:** Coronavirus crisis and the strict lockdown rules led to a severe disruption of the ENT service. A drop in overall activity of 91.1% was observed. Mortality rates increased from 0.82% to 4.55%. While some patients in real need may not have been able to be seen, others presented without ground. More than a quarter of admissions (n=157, 27.6%) resulted in no specific ENT treatment. Patient selection improved when patients had a recent ENT history (OR=2.39 [1.50-3.81], p=0.0003) or were referred by a physician (OR=5.30 [3.69-7.61], p<0.0001). **Conclusions:** Our data suggested impaired healthcare of all ENT patients. Special attention should be paid to non-Covid otolaryngology patients.

ENT Service during the COVID-19 pandemic: a cross-sectional study in 572 patients.

Short title : Healthcare delivery during the pandemic

Keywords : Covid-19, SARS-CoV-2, Healthcare delivery, Surgery, Emergency

KEYPOINTS

1. Lockdown measures have drastically restricted freedom of movement and outlawed public gatherings in order to protect health services.
2. However, health services may have been impacted by these measures, in particular in otolaryngology. Our goal was to prospectively evaluate ENT coverage in real life under lockdown rules.
3. The Coronavirus crisis resulted in a severe disruption of the ENT service, including outpatient, inpatient and surgical activities.
4. The comparison with last year's activity raised concerns about the quality of the care provided.
5. If the goal of avoiding crowds of people has been achieved, patients may not have received the care they deserve and special attention should be paid to non-Covid patients.

ABSTRACT

Objective : To provide objective data on the impact of COVID-19 crisis on our ENT practice.

Design : Cross-sectional study.

Setting : Tertiary referral hospital (1038 inpatients beds).

Participants : 572 consecutive patients presenting to the ENT clinic and ENT operating theatre from March 16, 2020 to May 3, 2020 were prospectively included.

Main outcome measures : Demographic and clinical data, admission time, paraclinic testing, management, outcome and follow'up were recorded. Retrospective search for comparison to past year over the same period of time was carried out.

Results : Coronavirus crisis and the strict lockdown rules led to a severe disruption of the ENT service. A drop in overall activity of 91.1% was observed. Mortality rates increased from 0.82% to 4.55%. While some patients in real need may not have been able to be seen, others presented without ground. More than a quarter of admissions (n=157, 27.6%) resulted in no specific ENT treatment. Patient selection improved when patients had a recent ENT history (OR=2.39 [1.50-3.81], p=0.0003) or were referred by a physician (OR=5.30 [3.69-7.61], p<0.0001).

Conclusions : Our data suggested impaired healthcare of all ENT patients. Special attention should be paid to non-Covid otolaryngology patients.

INTRODUCTION

In December 2019, a new coronavirus was isolated from a cluster of pneumonia in Wuhan.¹ The World Health Organization subsequently named this new entity as Coronavirus disease 2019 and declared pandemic status on March 11, 2020.² Many European countries have imposed lockdowns to combat the spread of the SARS-CoV2, to curb infection and death rates and protect health services. In Belgium, the lockdown has been declared on March 13 at midnight and was gradually relieved from May 4, 2020. These measures have generated profound changes in our ENT practice, restricting our activity to what deemed necessary and emergencies. The purpose of this study was to provide objective data on the impact of COVID-19 crisis on our ENT practice over the lockdown period.

MATERIALS AND METHODS

Study Design

Cross-sectional study.

Settings and Participants

All consecutive patients presenting to the ENT Department of [removed for blind peer review] from March 16 to May 3, 2020 (i.e. during the 7 weeks of lockdown) were prospectively included. For comparison to past year over the same period of time, a retrospective search of patients admissions between March 18 and May 5, 2019 was carried out.

Outcomes

Data regarding age, sex, origin, referring physician, time of arrival, diagnosis, management and patient outcome were collected. Diagnosis characteristics were complaint duration, location, ENT history in the past 30 days and ENT cancer history. Paraclinic testings were recorded (nasendoscopy, audiometry, swab, biopsy, blood test, medical imaging). Management was divided into 5 categories: discharge without ENT treatment, medical ambulatory treatment, medical inpatient treatment, minor ENT procedure (ENT procedure directly performed in the emergency room) and surgical treatment. Call of a senior ENT surgeon or referral to another physician were recorded. Patients outcome was registered as discharge, ENT follow'up, referral to GP or another specialist, admission to the ward. Patients emergency re-admission and/or dead in the next 30 days were recorded.

Statistical methods

Data distribution was evaluated by graphical method. Quantitative variables were summarised using median and interquartile range (P25-P75) and qualitative variables using frequency and percentage. Odds ratios (ORs) and 95% confidence intervals were calculated to evaluate the risk for a specific outcome. Outcomes

were categorized as follows: 1. No ENT treatment or ambulatory treatment; 2. specific ENT management (minor procedure, inpatient treatment, surgical procedure). Statistical analysis was carried out using the free software R (<https://www.r-project.org>) with RCmdr.

RESULTS

A total of 572 consecutive subjects were prospectively included between March 16 and May 3, 2020.

Outpatient activity

Overall, 568 patients were seen in our clinic over the 7-week period of lockdown (table 1). An average of 49 patients were admitted per day. Most (n=529, 93.3%) patients were ambulatory and came from the neighbourhood. More than half (n=306, 53.9%) of the patients had no recent ENT history. Twenty-two percent (n=126) patients were diagnosed with head and neck cancer before lockdown. The majority of patients were seen within normal working hours (n=55, 98.2%) and Wednesday was the busiest day of the week. One third of patients presented without appointment (n=206, 36.3%). Two thirds of patients were referred by an ENT surgeon, either an ENT surgeon from another hospital or private practice, or as part of the follow-up by our ENT team. Almost forty percent patients (n=225, 39.6%) underwent a minor ENT procedure, mainly post-operative care, but also ear suction, epistaxis management, immunotherapy, foreign body removal, biopsy, abscess puncture, tracheostomy care, nasogastric tube insertion and Semont maneuver for paroxysmal positional vertigo. More than a quarter of admissions (n=157, 27.6%) resulted in no specific ENT treatment. One fifth of patients (n=117, 20.6%) required ambulatory treatment. Seven patients required admission to the ward (n=7, 1.2%), mostly for intravenous antibiotic. Sixty-two patients required surgical treatment (n=62, 10.9%), mainly head and neck cancer cases.

Surgical activity

Sixty-six surgical interventions were carried out between March 16 and May 3, 2020 (table 2). Most patients were seen in outpatient clinic before surgery (n=43, 65.15%), but 9 (13.64%) patients were not. Forty (60.61%) patients had a previous history of head and neck cancer before their pre-operative assessment. Two (3.03%) patients were hospitalized within the month before surgery and 12 (18.18%) were already operated once within the month before (revision) surgery. Only one patient (1.52%) was operated outside normal working hours (bleeding after tonsillectomy). The main surgery type was head and neck surgery (n=63, 95.45%). Seven tracheostomies were performed for prolonged mechanical ventilation in Covid-19 positive patients. Three patients (4.55%) underwent nose surgery (2 nose fracture mobilizations and one foreign body removal). No otological surgery was performed during the study period. Three patients died within the month following their surgical intervention (mortality rate: 4.55%). Two of them had recurrent head and neck cancer with heart and renal failure respectively. A sixty-four year old lady died from multiple organ failure related to Covid-19 within the month following her tracheostomy.

Factors predicting a specific ENT management

Patients were significantly more likely to require specific ENT intervention when referred by a physician as compared to patients presenting spontaneously (OR=2.39 [1.50-3.81], p=0.0003). This selection was even better when the referring doctor was an ENT surgeon who had physically examined the patient (OR=3.26 [2.02-5.29], p<0.0001).

Management did not differ significantly between out-of-hours or business hours admissions (OR=1.41 [0.39-5.04], p=0.6005). Head and neck cancer history was not predicting a specific ENT management (OR=0.93 [0.63-1.38], p=0.7188). Conversely, any ENT history within the month made it more likely to require a specific ENT intervention (OR=5.30 [3.69-7.61], p<0.0001), in particular if this ENT history was a surgery (OR=29.23 [12.37-69.09], p<0.0001). Nose complaints were more likely to require technical or surgical management than ear or throat complaints (OR=2.71 [1.66-4.42], p=0.0001). Most frequent nose presentations were epistaxis and post-operative care. The likelihood of requiring a specific ENT treatment is summarized in Table 3.

Comparison to 2019 activity

The retrospective search of patients admissions retrieved 6454 subjects between March 18 and May 5, 2019 (table 4). There was therefore a drop in overall activity of 91.1%. When restricting the search to emergency patients, 301 patients had presented to our ENT clinic in emergency over the same period of time. The drop in emergency activity was of 31.56 % in 2020. The drop in surgical activity was of 81.92 % in 2020. Surgical mortality rate was 0.82% in 2019 for the same period, and 1.58% when restricted to emergency cases and head and neck cancer cases (4.55% during the 2020 lockdown).

DISCUSSION

Synopsis of key findings

Coronavirus crisis led to a severe disruption of the service provided by our ENT Department. Strict lockdown rules were overall well respected in our department. However, if the goal of avoiding crowds of people on our premises was achieved, patients might not have had the care they deserved.

Strengths of the study

To the best of our knowledge, this is the first study to prospectively assess real-life ENT coverage under lockdown rules.

Comparisons with other studies

Our study findings are in line with previous audits of the workload in ENT emergencies across Europe.³⁻⁵ Along with interruption of healthcare, residents saw a sharp decrease in training opportunities. Our results may explain anxiety and impaired well-being shown in residents' studies.⁶⁻⁸

Clinical applicability of the study

This audit demonstrated room for improvement. First, emergency cases admission dropped by 31.56 %. It can be assumed that accidents were less frequent with the general confinement of the population. However, not all ENT emergencies are traumatic and patients may not have dared to come. If the follow-up of cancer patients has been carried out, it is also possible that new cancers detection has been delayed. Reassuring communication is therefore necessary to allow patients to receive care even if they do not have a pathology linked to Covid-19.

The second room for improvement is patient selection. In our study, more than a quarter admissions did not need any treatment. The major factors of a better case selection were referral by a doctor and a recent ENT history. Epistaxis were clearly responsible for ENT emergency need. The incidence of epistaxis could have been increased by the generalization of nasopharyngeal PCR testing. However, epistaxis was the most frequent ENT emergency referral long before SARS-CoV2 testing.^{5,9}

Our study was not designed to study mortality rate and due to the small number, no definitive conclusion can be drawn. However, our data might suggest an increase in the all-cause death rate. Possible explanations might be the patient's fear of presenting to the hospital, work overload in primary care and overwhelmed teams in ICU.

The widespread impact and duration of this pandemic makes it unique from any crisis encountered to date by our specialty. While best-practice recommendations for ENT surgery amid Covid-19 are being implemented¹⁰, special attention should be paid to non-Covid patients. Otolaryngology service has to be up and running, albeit adapting, in close partnership with primary care.

REFERENCES

1. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020;395(10223):497-506.

2. World Health Organization WHO Director-General’s opening remarks at the media briefing on COVID-19—11 March 2020. Available at: <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19—11-march-2020>
3. Woods RS, Keane E, Timon CV, Hone S. Prospective audit of a dedicated ear, nose and throat emergency department and 24-year comparison. *Ir J Med Sci* 2017;186(1):247-254.
4. Vasani SS, De Zoysa NK, Ahluwalia G, Cumberworth V, Stearns M. Warning - ward-based treatment rooms increase risk in ENT emergency practice. *Clin Otolaryngol* 2007;32(3):221-2.
5. Bleach NR, Williamson PA, Mady SM. Emergency workload in otolaryngology. *Ann R Coll Surg Engl.* 1994;76(5):335-338.
6. Horton JD. To Be a Partner in Life-Resident Training During the COVID-19 Pandemic. *JAMA Otolaryngol Head Neck Surg* 2020;10.1001/jamaoto.2020.0921. doi:10.1001/jamaoto.2020.0921
7. Cai Y, Jiam NT, Wai KC, Shuman EA, Roland LT, Chang JL. Otolaryngology Resident Practices and Perceptions in the Initial Phase of the U.S. COVID-19 Pandemic. *Laryngoscope.* 2020;10.1002/lary.28733. doi:10.1002/lary.28733
8. Crosby DL, Sharma A. Insights on Otolaryngology Residency Training during the COVID-19 Pandemic. *Otolaryngol Head Neck Surg.* 2020;194599820922502. doi:10.1177/0194599820922502
9. Atta L, Delrez S, Asimakopoulos A, Bendavid G, Delhez A, Goffinet M, Rogister F, Lefebvre PP, Poirrier AL. A prospective audit of acute ENT activity in a university teaching hospital. *B-ENT* 2019;15:71-76.
10. Bann DV, Patel VA, Saadi R, et al. Impact of coronavirus (COVID-19) on otolaryngologic surgery: Brief commentary. *Head Neck.* 2020;10.1002/hed.26162. doi:10.1002/hed.26162 TABLE *Table 1* : Outpatient activity. *Table 2* : Surgical activity.

Table 3 : Odds ratios for having a specific ENT management(minor ENT procedure, inpatient treatment, surgical procedure).

Table 4 : Comparison to last year activity.

Hosted file

PeigneuxTABLE1.docx available at <https://authorea.com/users/331823/articles/458359-ent-service-during-the-covid-19-pandemic-a-cross-sectional-study-in-572-patients>

Hosted file

PeigneuxTABLE2.docx available at <https://authorea.com/users/331823/articles/458359-ent-service-during-the-covid-19-pandemic-a-cross-sectional-study-in-572-patients>

Hosted file

PeigneuxTABLE3'.docx available at <https://authorea.com/users/331823/articles/458359-ent-service-during-the-covid-19-pandemic-a-cross-sectional-study-in-572-patients>

Hosted file

PeigneuxTABLE4'.docx available at <https://authorea.com/users/331823/articles/458359-ent-service-during-the-covid-19-pandemic-a-cross-sectional-study-in-572-patients>