International Journal of Clinical & Experimental Otolaryngology (IJCEO)
ISSN 2572-732X

Trend in Otolaryngology Emergency Department Visits during the COVID-19 Pandemic at Atertiary University Hospital

Research Article

Gaelle Vanelssa Fotsing NgankamVofo[1*], Jacob Assaf[2], Nir Hirshoren[1], Ron Eliashar[1], Saar Hashavya[3], Menachem Gross[1]

[1] Department Otolaryngology, Head and Neck Surgery, Hadassah Hebrew-University Medical Centre, Jerusalem, Israel.
[2] Department of Emergency Medicine, Hadassah Hebrew-University Medical Centre, Jerusalem, Israel.
[3] Department of Pediatric Emergency Medicine, Hadassah Hebrew-University Medical Centre, Jerusalem, Israel.

Abstract

Objective: To determine the impact of COVID -19 on otolaryngology emergency department (E.D.) visits during the peak of the first wave of the pandemic.
Study Design: A retrospective study comparing demographical and clinical characteristics of patients between March and April 2020 to a similar period last year was carried out.
Setting: Otolaryngology emergency department of a tertiary University hospital in Israel.
Methods: All patients who presented to the E.D.during the study period were potential participants and the level of urgency or emergency of each case was evaluated.
Results: Among all the patients who presented to the E.D. as a whole, the proportion of otolaryngology E.D. visits in 2020 (2.6%) was significantly lower than that in 2019 (3.2%, p=0.003) giving a 43.2% reduction rate during the pandemic.While the proportion of traumatic (urgent) presentations minimally decreased in 2020 (26.0% to 35.4%, p= 0.009), there was a greater decrease in non-traumatic non-urgent presentations (26.9% to 15.9%, p=0.001). Almost all the patients had medical insurance coverage in both years (99.1% and 99.2%).
Conclusion: A good proportion of otolaryngology E.D. visits are unnecessary, as proven by the COVID-19 pandemic during which patients were afraid to utilize the E.D. from fear of contagion. Problems which resulted in E.D. visits in the past, did not during the crises. With adequate sensitization on the proper use of community otolaryngology health services, additional human and financial strain on E.D. services can be alleviated with resources channeled to building and running well-equipped intensive care units.

Keywords: COVID-19; Emergency; Emergency Department; Otolaryngology; Urgency.

Abbreviations: E.D.: Emergency Department; I.C.D-9-C.M.: International Classification of Diseases; Ninth Revision; Clinical Modification; P.C.R.: Polymerase Chain Reaction; W.H.O.: World Health Organization.

Introduction

The year 2019 concluded on a memorable note, with the emergence of a very deadly pandemic orchestrated by the SARS-CoV-2 virus (COVID- 19). Due to the nature of the disease, it rapidly spreads via contact with aerosols of infected patients. As of September 22, 2020, over twenty one million individuals in more than eighty countries have been infected, with worldwide mortality of 761,779 individuals. In Israel, 88, 488 people have been infected with 640 deaths [1]. Amongst many measures put in place by the World Health Organization (W.H.O) to prevent its spread, home isolation and social distancing have been obligatory [2]. These recommendations go a long way, affecting both social and economic ramifications, as well as health care delivery. Medical associations and academies worldwide brought forth recommendations and guidelines for the delivery of medical care to prevent transmission of COVID-19, not only protecting the patients but the medical personnel as well. The American Academy of Otolaryngology-

***Corresponding Author**:
Gaelle VanelssaFotsing NgankamVofo, MD
Department Otolaryngology, Head and Neck Surgery, Hadassah Hebrew, University Medical Centre, P.O.Box 12000, Jerusalem, Israel 91120.
Tel: 972-559248001
Fax: 972-2-6435090
E-mail: gaellefotsing@gmail.com

Received: September 23, 2020
Accepted: October 06, 2020
Published: October 16, 2020

Citation: Gaelle Vanelssa Fotsing NgankamVofo, Jacob Assaf, Nir Hirshoren, Ron Eliashar, Saar Hashavya, Menachem Gross. Trend in Otolaryngology Emergency Department Visits during the COVID-19 Pandemic at Atertiary University Hospital. *Int J Clin Exp Otolaryngol.* 2020;6(5):122-127. **doi:** http://dx.doi.org/10.19070/2572-732X-2000023

Head and Neck Surgery recommended that all Otolaryngologists limit the provision ofhealth care only to those individuals with time-sensitive, urgent, and emergent medical conditions [3].

In a nation where the health system is structured in a way that everyone has equal access to healthcare or even in nations with non-universal health insurance, the reasons for presentation to the emergency department (E.D.) are not always urgent. Moreover, each patient has access to medical care from otolaryngologists in the community who can comfortably manage most emergencies. For those patients who do present to the otolaryngology E.D., 62.77% of cases have been reported to be actual emergencies, predominantly in the otology subspecialty, with the remainder falling into rhinology, or Oro-pharyngo-laryngology or head and neck surgery (HNS) categories [4].

During the first wave of the COVID- 19 pandemic, the fear of contamination and death forced people to stay at home [5], except for the purchase ofgroceries, medication refills or medical emergencies [6], and also with the exception of essential workers like medical personnel, Post/delivery personnel, grocery workers, truckers, etc.

This study aimed to compare the frequency, demographics and clinical characteristics of otolaryngology conditions seen inthe E.D. during the peak of the first wave of the COVID- 19 pandemic to the same time the previous year. The months of March and April 2020 were chosen because this is whenthe height of the pandemic occurred, and the Ministry of Health and the World Health Organization (W.H.O.) increased sensitization about the virus with a corresponding increase in the number of COVID-19 polymerase chain reaction (P.C.R.) tests performed. The comparison to the same time the previous year was performed, to reduce confounders related to weather changes and holidays.

Materials and Methods

After receiving ethical approval from the institutional review board of Hadassah Hebrew-University Medical Centre, Jerusalem, Israel (HMO- 0267- 20), a retrospective study was performed. Evaluation of data included evaluating the frequency, demographic, clinical characteristics and incidence of urgent and non-urgent caspresenting to the E.D. of Hadassah Hebrew-University Medical Centre with otolaryngology complaints between March 01, 2020 and April 30, 2020. These parameters were then compared to the same data from the same otolaryngology E.D. from the previous year between March 01, 2019 and April 30, 2019.

Inclusion criteria

All patients (both pediatric and adult) who presented to the E.D. with otolaryngology complaints between March 01, 2020, to April 30, 2020, and patients who presented between similar dates in 2019 were included.

Exclusion Criteria

Cases with incomplete data.

Data collection

The medical files of patients who fulfilled the inclusion criteria were reviewed paying attention to the age, gender, main presenting symptoms, the duration of the symptoms, the diagnosis thought to be most urgent, the management received and mode of medical coverage. The International Classification of diseases, Ninth Revision, Clinical Modification (I.C.D.-9-C.M.) codes (Table 1) were preliminary set to divide patients into one of three categories:

All traumatic presentations were considered as urgent/emergent. For non-traumatic presentations, we preliminary set them as either urgent or non- urgent (Table 1). This was adapted from a classification used by De Andrade et al., [4] and is detailed as follows:

i. Traumatic presentations: penetrating and non-penetrating injuries to the ear, nose and throat and head and neck region, caustic ingestion, foreign bodies (any object, biological or not, accidentally located in the ear, nasal cavity or upper aero digestive tract), all forms of burns, amongst others.

ii. Non-traumatic, urgent presentations: sudden life- threatening conditions requiring immediate action, these included airway obstruction, epistaxis, sudden sensorineural hearing loss,severe vertiginous symptoms, any severe acute infection or inflammation in the ear, nose, aero- digestive tract and Neck region, abscesses in the head and neck region, amongst others, and

iii. Non-traumatic,non-urgent presentations: minimally distressing conditions to the patient, not posing an immediate threat to his/herlife like chronic sinusitis, cerumen impaction, long standing neck mass, amongst others.

The diagnoses and I.C.D.-9 codes of the patients within the above-mentioned categoriesare shown in Table 1.

The various diagnoses in both years were classified as per etiology as either infection/inflammation, trauma, hemorrhage (including epistaxis, post-operative bleeding, and bleeding from a tumor), foreign body, tumors, neuropathies (including facial nerve paresis/ paralysis, sudden sensorineural hearing loss, vocal cord paresis/ paralysis), cerumen impaction or others (Figure 1) as previously described by Cuchi in 1989 [7]. In cases where patients had more than one diagnoses, the more urgent diagnosis determined the urgency or emergency of the case. Additionally, for patients who had more than one visit to the otolaryngology E.D., each visit was considered separately.

The mode of medical coverage was divided into two groups: medical insurance coverage or out of pocket payment.

Duration of symptoms was determined based on the duration of the chief complaint to the time of presentation to the E.D. We further divided the symptoms into three sub-categories: symptoms that started within the same day (24 hours), 1 to 7 days, and more than seven days.

The management plan was also evaluated and classified into one of two groups: admission with or without surgical intervention (including foreign body removal), or discharge on oral medication.

The cases were divided into the following four subspecialties:

otology, rhinology, Oro- pharyngo-laryngology, and Head and neck surgery.

Statistical analysis

Descriptive statistics were reported as medians and means with standard deviations for continuous variables, and as numbers and percentages for categorical variables. Means were compared using the two-sample independent t-test. We equally used the chi-square test to compare the frequency of various categories occurring in the two years. A p-value of < 0.05 was set as statistically significant. The data were analyzed using IBM SPSS version 25.

Results

In the E.D. as a whole during these two months both years, 9791 patients presented in 2020 compared to 13679 in 2019 giving a reduction rate of 28.4%. To focus on the otolaryngology E.D., a total of 710 patients presented in both periods and their medical files were reviewed, with 17 (2.4%) being excluded due to incomplete information, leaving a total of 251 patientsin 2020 and 442 patients in 2019, the majority being patients presenting with otology related symptoms in both years. Both pediatric and adult emergency files were reviewed.

There was a significant reduction in the mean monthly otolar-

Table 1. Classification of Otolaryngology presentations at the emergency department during the study periods with ICD-9-CM codes.

i. Traumatic presentations	ii. Non- traumatic urgent presentations	iii. Non- traumatic non-urgent presentations
870-879- Open wound of head, neck and trunk	380.0- Perichondritis of pinna	240.9- Goiter
872- Open wound of ear	380.1- Infective otitis externa	380.2- Other otitis externa
900- Injury to blood vessels of head and neck	382.0- Acute suppurative otitis media	380.3- Non-infective disorders of pinna
910- Superficial injury of face, neck, and scalp except eye	383.0- Acute mastoiditis	380.4- Impacted cerumen
920- Contusion of face, scalp, and neck except eye	384.0- Acute myringitis without mention of otitis media	380.5- Acquired stenosis of external ear canal
925- Crushing injury of face, scalp, and neck	386.0- Meniere's disease	380.8- Other disorders of external ear
931- Foreign body in ear	388.3- Sudden hearing loss, unspecified	381.0- Acute non-suppurative otitis media
932- Foreign body in nose	388.3- Tinnitus	381.1- Chronic serous otitis media
933- Foreign body in pharynx and larynx	461.9- Acute sinusitis	381.2- Chronic mucoid otitis media
941- Burn of face, head and neck	462- Acute pharyngitis	381.9- Eustachian tube dysfunction
960-979- Poisoning by drugs, medicaments and biological substances	463- Acute tonsillitis	382.9- Unspecified otitis media
983- Toxic effect of corrosive aromatics, acids and caustic alkalis	464.0- Acute laryngitis	383.1- Chronic mastoiditis
987- Toxic effect of other gases, fumes, or vapors	464.2- Acute laryngotracheitis	383.9- Unspecified mastoiditis
998.1- Hemorrhage or hematoma complicating a procedure	464.3- Acute epiglottitis	384.2- Perforation of tympanic membrane
998.5- Postoperative infection	475- Peritonsillar abscess	386.9- Unspecified vertiginous syndromes and labyrinthine disorders
E861- Accidental poisoning by cleansing and polishing agents, disinfectants, paints, and varnishes	478.3- Paralysis of vocal cords or larynx	388.01- Presbyacousis
	478.19- Nasal vestibulitis	388.7- Otalgia
	527.2- Sialoadenitis	471- Nasal polyps
	527.3- Abscess of salivary glands	472.0- Chronic rhinitis
	682.1- Cellulitis and abscess of Neck	473- Chronic sinusitis
	683- Acute lymphadenitis	477- Allergic rhinitis
	784.2- Swelling, mass, or lump in head and neck	478.4- Polyp of vocal cord or larynx
	784.7- Epistaxis	478.5- Other diseases of vocal cords
	784.8- Hemorrhage from throat	530.81- Reflux
	995.0- Other anaphylactic shock	784.1- Throat pain
	995.1- Angioneurotic edema	784.2- Undetermined neck mass
	H81.4- Acute Severe vertiginous attack	784.4- Voice disturbance
		990- Effects of radiation, unspecified

ICD-9-CM: International Classification of diseases, Ninth Revision, Clinical Modification

yngology visits to the E.D. during the peak of the first wave of COVID- 19 pandemic compared to March and April 2019 (221 ± 26.9 to 125.5 ± 3.5, p = 0.038). Among all the patients who presented to the E.D. as a whole, the proportion of otolaryngology E.D. visits in 2020 (2.6%) was significantly lower than that in 2019 (3.2%, p=0.003) giving a 43.2% reduction rate during the pandemic. When evaluating the reduction rate as per subspecialty, we observed a 51.9% reduction rate in otology presentations, a 68.6% reduction rate in Head and Neck presentations, a 29.2% reduction rate in Oro-pharyngo-laryngology presentations and, a 30.5% reduction rate in Rhinology presentations in 2020 compared to 2019. There was a greater reduction in combined Otology and Head and Neck presentations (54.4%) compared to combined Oro-pharyngo-laryngology and Rhinology presentations (29.9%, p=0.001).Table 2 depicts the comparison of patients consulted as per subspecialty over the two time frames.

The age range, the median age, as well as the mean age of patients in 2020 was similar to that of patients in 2019. In both years, the gender distribution was almost equal, and almost all patients had medical insurance. While in 2020, during the COVID-19 pandemic, there was a significantly lesser decrease in the proportion of traumatic presentations (26.0% to 35.4%, p=0.009), there was a significantly greater decrease in non-traumatic non urgent presentations (26.9% to 15.9%, p=0.001) as compared to 2019. Table 3 summarizes the clinical characteristics of patients who presented to the otolaryngology E.D. during the peak of the COVID-19 pandemic, in comparison with 2019. Similarities were found in the etiologies of E.D. presentations in both years, with acute severe infections and trauma being the primary diagnosis, as shown in Figure 1.

When comparing the duration of presenting complaints before arrival to the E.D., significant differences were not shown between the two periods. The management of patients in both years was compared, and it was found that a significant percentage of patients were hospitalized and/ or benefited from some form of surgical intervention during the COVID-19 pandemic as compared to 2019 (51% to 39.6%, p=0.004), (Table 3).

Discussion

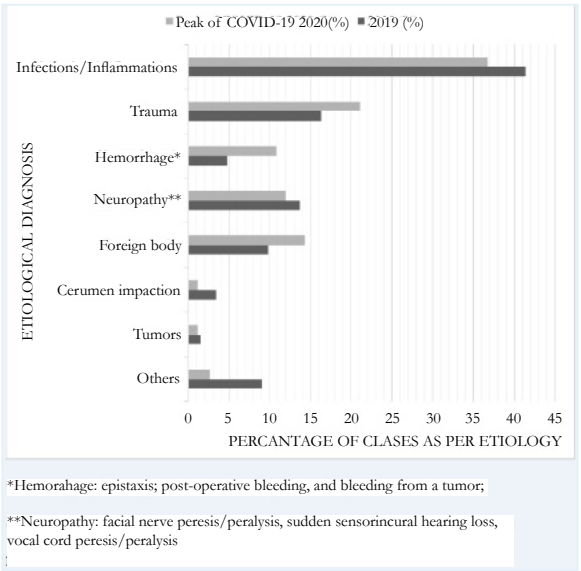
The SARS-CoV-2 virus isknown to be deadly [1], being a burden worldwide, greatly offsetting the trend in every discipline. To date, there is no definitive cure nor vaccine, but there are many ongoing clinical trials [8]. As a result, during the peak of the first wave of the virus, many patients avoided the hospital E.D., for fear of contacting COVID-19 or following home isolation orders. It is assumed that they instead sought care from their community physicians or stayed at home with their ailments, as demonstrated by this study. Here, we assessed the demographic and clinical characteristics of patients who presented to the otolaryngology E.D. of a tertiary University hospital in Israel during the peak of the first wave of the COVID- 19 pandemic (March and April 2020), when home isolation and social distancing was obligatory, comparing the findings to the same time the previous year.

As expected, there was a 28.4% reduction in the total E.D. vis-

Table 2. Comparison of otolaryngology emergency department visits as per subspecialty during the two time frames.

Subspecialty	COVID-19 pandemic 2020	2019	
Otology	99 (39.4%)	206 (46.6%)	p = 0.080
Oro-Pharyngo- laryngology	75 (29.9%)	106 (24.0%)	p = 0.105
Rhinology	66 (26.3%)	95 (21.5%)	p = 0.161
Head and Neck surgery	11 (4.4%)	35 (7.9%)	p = 0.081
Total	251 (100%)	442 (100%)	

Figure 1. Classification of the number of emergency cases as per etiology; during the peak of COVID-19 in March and April 2020 (Gray line) and in March and April 2019 (Black line).



*Hemorahage: epistaxis; post-operative bleeding, and bleeding from a tumor;

**Neuropathy: facial nerve peresis/peralysis, sudden sensorincural hearing loss, vocal cord peresis/peralysis

Table 3. Characteristics of patients who presented to the otolaryngology emergency unit in 2019 as compared to 2020.

Characteristics	COVID-19 pandemic 2020	2019	
Mean number of ER Visits per month (± SD)	125.5 ± 3.5	221 ± 26.9	p= 0.038
Mean age in years (± SD)	35.0 ± 24.6	34.8 ± 21.8	
Median age in years	31.6	30.9	
Age range (years)	0.37 – 91.0	0.49 – 93.4	
Female	124 (49.4%)	230 (52.0%)	
Insurance coverage	255 (99.2%)	449 (99.1%)	
Etiological classification			
Traumatic presentations	89 (35.4%)	115 (26.0%)	p=0.009
Non-traumatic, Urgent	122 (48.6%)	208 (47.0%)	p=0.752
Non-traumatic, non- urgent	40 (15.9%)	119 (26.9%)	p=0.001
Duration of symptoms prior to presentation			
<24 hours	123 (49.0%)	202 (45.7%)	p= 0.429
1-7 days	74 (29.5%)	150 (33.9%)	p= 0.238
>7 days	54 (21.5%)	90 (20.4%)	p= 0.770
Admission and/or surgical intervention	128 (51.0 %)	175 (39.6 %)	p= 0.004

SD = standard deviation; ER= Emergency Department

its. In this same light, a 43.2% reductionin total otolaryngology presentations was recorded, with a decrease in the mean monthly patient attendance during the COVID- 19 pandemic compared to 2019 (p= 0.038). This is not surprising as the SARS pandemic of 2003 reported a similar trend in the general E.D. visits [9], but the question is, what happened to the previously annotated emergency cases? One could argue that means of public transportations during the lock-down and distance to our hospital could have influenced E.D. visits but this could have also been true for community health facilities, and secondly, the use of ambulance services was unaffected.

Also, during the COVID- 19 pandemic, there was alesser decreasein the proportion of traumatic (urgent) presentations (26.0% to 35.4%, p= 0.009), and a greater decrease in non-traumatic non-urgent presentations (26.9% to 15.9%, p=0.001) as compared to 2019. Thismay demonstrate that only patients with real emergencies presented to the E.D. and patients with non- traumatic non-urgent pathologies may have stayed at home or sought care at the primary care physician. If this trend continues, the over-utilization of E.D. and the un-due use of human and hospital resources could be markedly reduced, and this is speculated to continue until a cure orvaccine is discovered. The resources being strained include increased utilization of medical supplies, time, increased work load and fatigue of medical personnel. Both pediatric and adult cases were reviewed, thus making our results representative of the general otolaryngology E.D. trend. Our findings are consistent with those previously reported by De Andrade et al., [4] and by Gallo et al., [10] who concluded that a good proportion of pathologies managed in the otolaryngology E.D. were in fact not urgent and could be managed by community otolaryngologists. The World Health Organization (W.H.O.) recommends that community health workers should continue the care and management of patients, while being alert of the symptoms of COVID-19 in order to promptly activate the COVID-19 care pathway when the need arises [11].

Combined Otology and Head and Neck presentations reduced by more than half (54.4%) while combined Oro-pharyngo-laryngology and Rhinology presentations reduced by only one third (29.9%, p=0.001). This is significant because most of the symptoms related to COVID-19 fall within the latter combination, but given that this was a retrospective study, we were limited by the fact that we could not correlate the change in Oto-pharyngo-laryngology and Rhinology complaints to SARS-CoV-2 PCR tests results as not every patient with these complaints were tested.

Most of the patients who presented to the E.D. during the pandemic warranted hospitalization, with or without, some form of surgical intervention as compared to patients who presented in 2019 (51.0 % to 39.6 %, p=0.004). This further emphasizes the actual emergency of these consultations, despite the fear of contagion. This, however, cannot exclude the fact that a proportion of patients with real emergencies were afraid to come to the E.D [5]. and for these patients, sensitization on the utilization of Otolaryngology community services should be increased.

The primary diagnosis was classified according to etiology as described by Cuchi in 1989 [7], with the most common etiological factors being acute severe infections and trauma in both years. Of note, there was a marked decrease in less compelling presentations, such as cerumen impaction.

The vast majority of patients who presented both in 2020 and in 2019 had medical insurance coverage (99.1% and 99.2% respectively). This is not surprising in a country in which almost every citizen has equal access to healthcare. It is, however, in stark contrast to the situation in other countries, as reported by the findings of Bergmark et al., In their study, they found that, access to primary care in the E.D. was limited based on insurance status, particularly for un-insured pediatric patients [12]. Although this is actually a sign of economic maturity, it tends to be abused by the insured consumers. As for uninsured consumers, out-of-pocket payment to private clinics or to the E.D. is basically their only

means of receiving health care, but in this study, uninsured consumers were mainly tourists or new immigrants.

Finally, when comparing the COVID-19 pandemic to the SARS pandemic of 2003, the later was short-lived lasting only for eight months, but with the COVID- 19 pandemic, no one can accurately project its duration and hence, the importance of appropriate utilization of resources [13].

Conclusion

The otolaryngology E.D. is often filled by patients with pathologies that are not always urgent, potentially manageable by otolaryngologists in the community. The resultant un-due use of both human and financial resources puts much strain on medical systems despite the rising need of well-equipped intensive care units. The wake of the COVID-19 pandemic has shed much light on the way medical management can be modified, and the long term effects of this realization can potentially alleviate some of the stress on medical systems. As we move forward in the COVID-19 pandemic, however, consideration of resources and provision of maximum care to our patients should remain the top priority.

Acknowledgment

We will like to thank Brice Vofo, M.D. for his guidance in statistical analysis, Adi Ben Nun and Ronit Brodie, M.P.A.S. for their assistance in data collection and manuscript preparation respectively.

Human Ethics Approval Declaration

Ethical approval was obtained from the institutional review board of Hadassah Hebrew-University Medical Centre, Jerusalem, Israel (HMO- 0267- 20).

References

[1]. World Health Organization. Coronavirus disease (‍COVID-19)‍: situation report, 209. InCoronavirus disease (‍COVID-19) ‍: situation report, 209 2020.
[2]. World Health Organization. Coronavirus disease (COVID-19) advice for the public. 2020.
[3]. American Aademy of Otolaryngology — Head and Neck Surgery. New Recommendations Regarding Urgent and Non- urgent Patient Care 2020.
[4]. Andrade JS, Albuquerque AM, Matos RC, Godofredo VR, Penido Nde O. Profile of otorhinolaryngology emergency unit care in a high complexity public hospital. Braz J Otorhinolaryngol. 2013 May-Jun; 79(3):312-6. Pubmed PMID: 23743746.
[5]. Barten DG, Latten GHP. Re: 'Non-COVID-19 visits to emergency departments during the pandemic: the impact of fear'. Public Health. 2020 Aug; 185:47. Pubmed PMID: 2540610.
[6]. Israel Ministry of Health. The Novel Coronavirus - The ministry of Health updates for public guidelines for the new routine 2020.
[7]. Cuchí Broquetas A. Emergencies in otorhinolaryngology: etiologic study. An Otorrinolaringol Ibero Am. 1989; 16(5):485-504. Pubmed PMID: 2510542.
[8]. World Health Organization. Living mapping and living systematic review of Covid-19 studies 2020.
[9]. Huang HH, Yen DH, Kao WF, Wang LM, Huang CI, Lee CH. Declining emergency department visits and costs during the severe acute respiratory syndrome (SARS) outbreak. J Formos Med Assoc. 2006 Jan; 105(1):31-7. Pubmed PMID: 16440068.
[10]. Gallo A, Moi R, Minni A, Simonelli M, de Vincentiis M. Otorhinolaryngology emergency unit care: the experience of a large university hospital in Italy. Ear Nose Throat J. 2000 Mar; 79(3):155-8. Pubmed PMID: 10743760.
[11]. World Health Organization. Community-based healthcare, including outreach and campaigns, in the context of the COVID-19 pandemic. Geneva: World Health Organization. 2020.
[12]. Bergmark RW, Ishman SL, Phillips KM, Cunningham MJ, Sedaghat AR. Emergency department use for acute rhinosinusitis: Insurance dependent for children and adults. Laryngoscope. 2018 Feb; 128(2):299-303. Pubmed PMID: 28730629.
[13]. World Health Organization. Summary table of SARS cases by country, November 1 2002–August 7, 2003. [Cited 2003 Sep 15].