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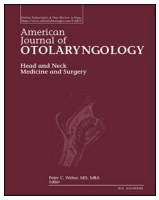

ENT emergencies during the first wave of COVID-19 pandemic in Spain: Our experience

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ABSTRACT

Objectives: To analyze the characteristics of the visits attended to in an ENT Emergency Department (ENT-ED) during the first wave of COVID-19, comparing them with the emergencies attended to during the same period of time in 2019.

Methods: Descriptive and analytical observational retrospective study of all emergency consultations between March 1, 2020, and May 21, 2020, carried out by the Otorhinolaryngology–Head and Neck Surgery Department of a tertiary university hospital. The adequacy of consultations was assessed with the Hospital Emergency Suitability Protocol (HESP). The correlation between the emergencies and the SARS-CoV-2 confirmed cases was assessed with a generalized linear model.

Results: Although there was a decrease of almost 50% in ENT-ED visits during the first wave of COVID-19, the pattern of most cases remained similar to the pre-COVID-19 era: non-urgent consultations, not previously assessed by Primary Care (PC), being considered inadequate by the HESP. The three main reasons for consultation were otalgia, odynophagia, and epistaxis. The number of ENT-ED visits and the total number of confirmed cases of SARS-CoV-2 in the health area were correlated.

Conclusions: SARS-CoV-2 pandemic was a challenge for the Spanish health system. The critical epidemiological situation experienced during March, April, and May explains the reduction in the number of visits to the ENT-ED. However, this condition did not affect the predominant pattern of visits with respect to the pre-COVID-19 era, which were mostly inadequate. A strengthening of PC and an improvement in the population's health education is essential.

1. Introduction

After the diagnosis of the first homeland SARS-CoV-2 case in Spain at the end of January, there was an exponential growth of infected patients. In mid-March, given the spread of the disease and fearing an eventual collapse of the healthcare system, a state of alarm was established at a national level, reducing the mobility of the population to certain assumptions (basics needs as medical, working or food issues) [1].

The adaptation and response of urgent care services, both in PC and in hospitals, became one of the most important points of health reaction. Emergency services were one of the main target sectors of the reorganization of the system, given its importance as the first point of contact with many patients, in a situation in which PC was also exhausted. In this sense, the emergency care in ENT patients has also been altered following the onset of the COVID-19 outbreak, and, seemingly, many non-COVID-19 illnesses have been disappearing [2,3].

The objective of this study is to analyze the consultations attended in

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the ENT-ED of our service during the first wave of COVID-19, comparing it with the emergencies attended in the same period of time in 2019, with the aim of finding out to what extent the COVID-19 pandemic changed the pattern of visits to the emergency department.

2. Methods

2.1. Study design and data collection

A descriptive and analytical observational retrospective study of all emergency consultations between March 1, 2020 and May 21, 2020 carried out by the Otorhinolaryngology–Head and Neck Surgery Department of a tertiary university hospital was performed. The same period of dates in 2019 was reviewed as a comparison group. This research was approved by the Hospital's Ethics Committee.

The date and reason of consultation, sociodemographic variables, the origin of the patient (referred after evaluation by PC physician or another emergency physician, or on their own initiative), outcome of the consultation (discharge or admission, referral to the hospital emergency department, follow-up in outpatient) and the adequacy of the consultation to the emergency department according to the Hospital Emergency Suitability Protocol (HESP) [4], were collected. Likewise, the epidemiological data of *Galicia* (2,698,764 inhabitants) and the health care area of the hospital (550,000 inhabitants) for the established date range, provided by the *Servizo Galego de Saúde* (SERGAS, *Xunta de Galicia*) [4], of the SARS-CoV-2 pandemic were obtained in order to make a comparison with the volume of emergencies.

2.2. Hospital emergency suitability protocol

The HESP is an instrument that seeks to identify inappropriate visits to the hospital emergency department, through the study of multiple criteria, grouped into 5 sections (clinical severity of the patient, intensity of the treatment administered, need for urgent diagnostic tests, outcome of the consultation to Emergencies and the existence of particular situations that justify the adequacy of spontaneous visits). The fulfillment of a single criterion of any section would identify the visit to the emergency room as adequate, while those cases that did not fulfill any criterion would be considered inappropriate [5].

2.3. Statistical analysis

Statistical analysis was performed with SPSS version 24.0 for Windows (IBM). Statistical tests were 2 tailed with a 95% confidence interval. Normality was evaluated by the Kolmogorov-Smirnov test and variances using the Levene test. Quantitative variables were expressed as mean ± standard deviation and median. The comparison of means between groups was performed using the Student t, Mann-Whitney, analysis of variance, or Kruskal-Wallis test as appropriate. Qualitative variables were expressed as frequency and percentage. The differences between groups were evaluated by the χ^2 test, Fisher exact test, or its variants as appropriate. A generalized linear model selecting the model according to the Akaike information criterion (AIC) and the analysis of the residuals was performed to assess the correlation between the number of emergencies and the SARS-CoV-2 confirmed cases [6].

3. Results

A total of 2317 emergencies were collected during the period studied, 1527 (65.9%) during 2019 and 790 (34.1%) during 2020 (p = 0.000). Analyzing each month individually, no differences were observed in terms of the volume of consultations from one year to the next (p = 0.064).

No differences were obtained in the distribution of emergency visits according to gender between years (p = 0.621) or analyzing each month individually (Table 1). The mean age of the sample was 52.1 ± 20.67 (range: 1.73–98.93) years. Being in 2019 of 52.37 ± 20.18 (range: 3.05–98.93) years, and in 2020 of 51.56 ± 21.58 (range: 1.73–97.17) years (p = 0.380). Comparing each year individually, there were no statistically significant differences between months in 2019 (p = 0.960) or 2020 (p = 0.172).

Table 1
Descriptive analysis of visits to the emergency room department collected during the period studied and segmented by month.

			YEAR		TOTAL	*p*-value
			2019	2020		
Month N (%)	March	Male	253 (47.7)	142 (46.0)	395 (47.1)	0.618
		Female	277 (52.3)	167 (54.0)	444 (52.9)	
		Total	530 (34.7)	309 (39.1)	839 (36.2)	
	April	Male	241 (47.9)	131 (51.0)	372 (48.9)	0.425
		Female	262 (52.1)	126 (49.0)	388 (51.1)	
		Total	503 (32.9)	257 (32.5)	760 (32.8)	
	May	Male	224 (45.3)	107 (47.8)	331 (46.1)	0.300
		Female	270 (54.7)	117 (52.2)	387 (53.9)	
		Total	494 (32.4)	224 (28.4)	718 (31.0)	
Total			1527 (65.9)	790 (34.1)	2317	0.000

N, Number.

3.1. ENT emergency care

The origin of the patients was studied, and no statistically significant differences were found between 2019 and 2020 (p = 0.184). In 2019, most of the patients came on their own initiative (n = 905; 59.3%), followed by those referred from PC (n = 499; 32.7%) and from the emergency department of the hospital itself (n = 107; 7.0%). In 2020 the same order was observed, with 441 (55.8%), 283 (35.8%) and 64 (8.1%) visits, respectively.

The adequacy of ORL emergency room visits was evaluated using HESP, finding differences between 2019 and 2020 (p = 0.008). An increase in adequate visits in 2020 (n = 484; 61,3%) in respect to 2019 (n = 848; 55,5%) was observed. Regarding the origin of the patients, no differences were found in the adequacy of the emergency room (Table 2).

3.2. Reasons for consultation

The reasons for consultation were collected and analyzed (Table 3), obtaining differences in the distribution between 2019 and 2020 (p = 0.003). Analyzing monthly comparisons between both years, no differences were found between months of March (p = 0.092) or April (p = 0.086), being significant only between months of May (p = 0.032). Likewise, the adequacy of the reasons was analyzed according to the HESP, with only differences for "Otalgia" (p = 0.000). During 2019, 120 (36.6%) of the total of 328 consultations for this reason were adequate compared to 75 (50%) of 150 in 2020.

3.3. Correlation and generalized linear model

A correlation, represented in Fig. 1, was found between the number of ENT-ED visits (dependent variable) and the total number of confirmed cases of SARS-CoV-2 in the health area (−0.077; p = 0.006). The confirmed cases of SARS-CoV-2 in the Region (*Galicia*) did not show a statistically significant relationship (−0.002; p = 0.649).

Table 2
Origin and outcome of Otolaryngology emergency visits and adequacy analysis.

				Year		Total	*p*-value
				2019	2020		
Own initiative	HESP	Suitable	Number	258	141	399	0.191
			%	28.5	32.0	29.6	
		Not suitable	Number	647	300	947	
			%	71.5	68.0	70.4	
	Total			905	441	1346	
Primary care	HESP	Suitable	Number	484	279	763	0.165
			%	97.0	98.6	97.6	
		Not suitable	Number	15	4	19	
			%	3.0	1.4	2.4	
	Total			499	283	782	
Hospital emergency referral	HESP	Suitable	Number	104	64	168	0.177
			%	97.2	100.0	98.2	
		Not suitable	Number	3	0	3	
			%	2.8	0.0	1.8	
	Total			107	64	171	
Discharge	HESP	Suitable	Number	584	400	984	0.003
			%	51.6	58.7	54.3	
		Not suitable	Number	547	281	828	
			%	48.4	41.3	45.7	
	Total			1131	681	1812	
Follow-up	HESP	Suitable	Number	140	37	177	0.029
			%	57.4	74.0	60.2	
		Not suitable	Number	104	13	117	
			%	42.6	26.0	39.8	
	Total			244	50	294	
Hospitalization	HESP	Suitable	Number	104	40	144	0.550
			%	97.2	95.2	96.6	
		Not suitable	Number	3	2	5	
			%	2.8	4.8	3.4	
	Total			107	42	149	
Referral to hospital emergency	HESP	Suitable	Number	17	7	24	0.301
			%	70.8	53.8	64.9	
		Not suitable	Number	7	6	13	
			%	29.2	46.2	35.1	
	Total			24	13	37	

HESP, Hospital Emergency Suitability Protocol.

Table 3
Analysis of the reasons for consulting of the otolaryngology emergency department.

Reason for consultation		Year		Total
		2019	2020	
Otalgia	Number	328	150	478
	%	21.9	19.1	20.9
Odynophagia	Number	285	134	419
	%	19.0	17.1	18.3
Epistaxis	Number	189	108	297
	%	12.6	13.8	13.0
Foreign body in UADT	Number	174	124	298
	%	11.6	15.8	13.0
Hearing loss sensation	Number	159	69	228
	%	10.6	8.8	10.0
PO complications	Number	59	19	78
	%	3.9	2.4	3.4
Hemoptysis	Number	14	13	27
	%	0.9	1.7	1.2
TEP dysfunction	Number	24	10	34
	%	1.6	1.3	1.5
Cervico-facial mass	Number	92	73	165
	%	6.1	9.3	7.2
Cough	Number	10	7	17
	%	0.7	0.9	0.7
Nasal symptoms	Number	22	16	38
	%	1.5	2.0	1.7
Others	Number	144	61	205
	%	9.6	7.8	9.0
Total	Number	1500	784	2284

UADT, upper aerodigestive tract; PO, post-operative; TEP, tracheoesophageal puncture.

4. Discussion

The exponential increase in cases since the first SARS-CoV-2 patient diagnosed in Spain (January 31, 2020) and the overload of primary and hospital care meant a great effort for the society [7]. It was necessary to adapt the public health system to the epidemiological situation, reorganizing hospitals and restructuring PC, limiting surgical activity to essential cases (emergencies and oncology) and improving the distribution of health resources (human, material and structural) [8–11]. Attention in the general emergency services was found to be irremediably focused on the care of COVID-19 patients given the expansion of the disease, and was largely the object of the logistical and personnel restructuring undertaken by the public health system [2,3,12–14]. For this reason, the objective of this study was to analyze the impact of COVID-19 on the assistance to the ENT-ED.

The volume of patients attended in the ENT-ED during the established period registered a statistically significant decrease of 48,26% with respect to the consultations attended the previous year. Studies in other European countries, such as Italy, show much more pronounced decreases, between 62% and 81% with respect to the activity in 2019 [2,3], with peaks reaching 90% [3]. This decrease correlates significantly with the epidemiological situation in our health area (Fig. 1) and it could be related to an increase in telemedicine practiced from PC, to an intensification of outpatient treatment, to the total confinement measures adopted by the country or to the population's fear of possible nosocomial infection by COVID-19.

Despite the general decrease in urgent consultations, the specific month-to-month comparison between 2019 and 2020 does not show any statistically significant differences. However, as in 2019 the visits presented a homogeneous influx in the three analyzed months, in 2020 the

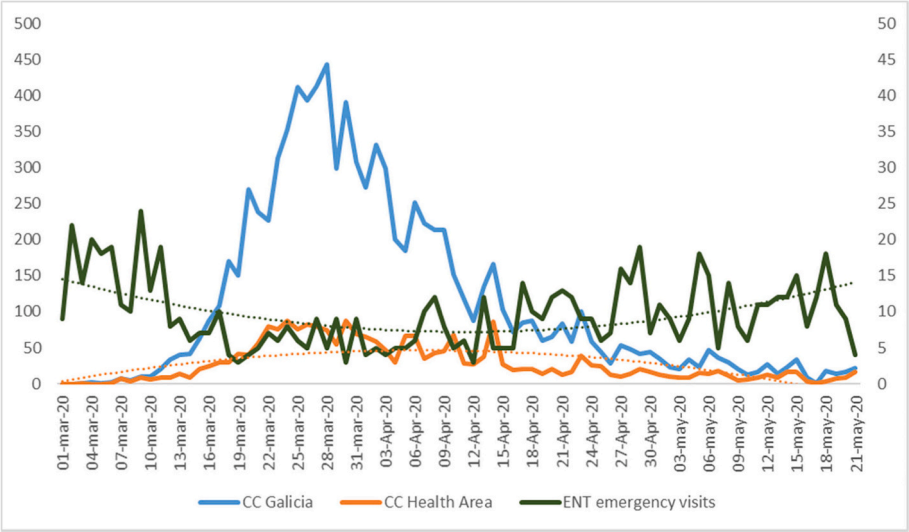

Fig. 1. Trend in ENT emergency visits and SARS-CoV-2 confirmed cases (CC) during the studied period in 2020.

month of March presented a higher volume than expected (around 33%) and a decrease in April and May. This increase in healthcare demand in March is possibly related to the search for medical assessment prior to a foreseeable worsening of the epidemic and health system situation, or to the fear of possible confinement. In April and May, with both home confinement and the saturation of the healthcare system a reality, the decrease in urgent ENT consultations in our healthcare area became apparent.

At first, we might think that this decrease in emergency visits during the first wave of SARS-CoV-2 would be accompanied by an increase in the proportion of justified, urgent and adequate consultations with respect to consultations in pre-COVID-19 era, or with respect to consultations considered inappropriate, non-urgent or unjustified. However, the analysis of the data shows that during the pandemic stage there was no change in the origin of the patients (both in 2019 and in 2020 slightly more than 50% of the patients came to the service on their own initiative, without a previous assessment by PC) but, according to HESP, during the first SARS-CoV-2 pandemic wave the adequacy in ENT-ED visits was 61.3%, a statistically significant increase over 2019, where the adequacy was 55.5%. Studies about adequacy in pre-COVID-19 era on the application of the HESP in our country show figures of around 75% of visits on their own initiative, with an adequacy rate of around 62.1% [15–17]. The decrease in the percentage of spontaneous consultations to the ENT-ED during the pandemic, compared to data of pre-COVID-19 era, should be accompanied by a significant improvement in the adequacy of visits assessed by the HESP, due to an increase in the proportion of consultations referred after a previous medical assessment. That significant improvement in adequacy has not taken place.

The outcome of the visits, however, does show significant differences: in 2020, there was an increase in the number of consultations that were directly discharged from hospital, with a decrease in the number of cases referred to outpatient care. This could mean that, during this period of the COVID-19 crisis, the cases attended to in the service were less severe than in 2019, not requiring any subsequent follow-up, having possibly benefited from a previous consultation in their PC Center.

The reasons for consultation do not present significant changes either, being the most frequent, in both periods and from more to less frequency, otalgia, odynophagia, epistaxis, foreign body sensation and hearing loss. Of the above, the reason for consultation that registered the greatest decrease in 2020 as opposed to 2019 was the tamponade/hearing loss (−56.6%), and the least was foreign body sensation (−28.74%). This leads us to think that many patients and doctors were more selective when making and referring their consultations, doing so only in those cases that they considered truly needed to be evaluated by a specialist. The study of the adequacy of the reasons for consultation in 2020 shows, however, only significant improvements in consultations for otalgia, probably related to the fact that during the pandemic situation outpatient treatment of otological pathology was the norm, referring only the refractory or more severe cases to the ED.

The use of the HESP allows us to assess whether referral of a case to the hospital emergency department from PC is considered appropriate. It is a tool that, if well used, can improve the efficiency and effectiveness of health care. However, we believe that some of the criteria considered as “adequate” can be improved for ENT cases. For example, the simple referral of a patient to the emergency department by a PC physician is directly considered an appropriate referral, and we believe that this is not always the case. In the case of, for example, a suspected foreign body sensation that requires a fibroscopy for study and diagnosis, not available in an outpatient center, a referral may be considered appropriate. But in the case of acute otitis externa, which can be managed on an outpatient basis with topical antibiotic therapy, we consider the referral to be inadequate, and HESP does not. The development of an ENT-oriented HESP, with revision of the criteria of adequacy would be convenient in future studies.

5. Conclusions

The SARS-CoV-2 pandemic was a challenge for the Spanish health system. The worsening of the epidemiological situation, probably added to the fear of contagion among the population and the establishment of home confinement, explains the reduction in visits to the specialty emergency services, which contributed to a better redistribution of health resources to more areas. However, the pattern of visits made to the ORL emergencies during the health alert is similar to pre-COVID-19 visits.

Adequate health education of the population is essential for the proper functioning and support of the system. To make this possible, strong PC with personnel and resources that can deal with these situations and alleviate the care pressure on hospital services is needed, as well as a better interconnection between general and specialized care, seeking greater contact between professionals for the sake of greater effectiveness and efficiency in medical care.

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Ethics approval, consent to participate and consent for publication

This research was approved by the Complexo Hospitalario Universitario de A Coruña Ethics Committee.

Declaration of competing interest

The author(s) declare(s) that there is no conflict of interest.

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