

Perception of the COVID-19 pandemic in patients with achalasia and its impact on gastrointestinal symptoms: a proof-of-concept study

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Abstract

Background Currently, no data are available on COVID-19 pandemic perception in patients with achalasia. We evaluated how the COVID-19 lockdown was perceived by these patients and its impact on their upper gastrointestinal symptoms.

Methods COVID-19 perception was assessed in 64 patients with achalasia using a previously published survey. Upper gastrointestinal symptoms were assessed using a standardized questionnaire and the results were compared to those obtained before the COVID-19 pandemic. All questionnaires were administered by telephone/video calls during the second Italian lockdown.

Results Fifty-one patients (79.7%) responded to the survey. For the question “On a 0-100 scale, how worried are you about the COVID-19 pandemic?” the mean score was 72.8 ± 27.1 , and 64.7% of patients with achalasia gave a score >60 on a visual analog scale of 0-100. In addition, those who considered themselves more vulnerable or anxious about contracting the infection than the general population, showed a significantly higher score for COVID-19 fear compared to those who felt less vulnerable or anxious (79.7 ± 27.6 vs. 62.5 ± 23.6 , $P=0.027$; 80.9 ± 19.6 vs. 57.1 ± 33.1 , $P=0.002$, respectively). The selected patients ($n=29$), who had not undergone any change in medical/surgical treatment for at least one year before the COVID-19 pandemic, had a significant worsening of the intensity-frequency score of regurgitation, heartburn, odynophagia, water brash, and epigastric burning during the lockdown ($P<0.05$). Finally, 75% of the patients were very interested in using Telemedicine.

Conclusions The COVID-19 lockdown had a significant impact on the psychological aspects and upper gastrointestinal symptoms of patients with achalasia. Telemedicine might represent a follow-up strategy.

Keywords Esophageal achalasia, COVID-19, telemedicine, anxiety, stress

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Introduction

Achalasia (Ach) is a rare primary disorder of esophageal motility characterized by insufficient relaxation of the lower esophageal sphincter (LES) and an absence of peristalsis. The annual incidence is estimated to be between 1.07 and 2.2 cases per 100,000 individuals, with estimated prevalence rates between 10 and 15.7 per 100,000 individuals [1]. Peak incidence occurs between 30 and 60 years of age [2]. The pathogenesis of Ach is thought to be the selective loss of inhibitory neurons in the myenteric plexus of the distal esophagus and LES, resulting in a neuronal imbalance of excitatory and inhibitory activity [3]. Ach manifests with progressive dysphagia to solids and liquids, heartburn, chest pain, regurgitation, and varying degrees of weight loss or nutritional deficiencies [4]. In spite of the various therapeutic options [5], Ach creates significant problems both from the nutritional point of view [6] and regarding quality of life (QoL) [7].

COVID-19 is an airborne infectious disease caused by SARS-CoV-2. The WHO declared COVID-19 “a Public Health Emergency of International Concern” on January 30, 2020, and a pandemic on March 11, 2020. On March 9, 2020, the Italian government officially initiated the first national lockdown, which lasted 69 days. A new spike in infections occurred in the fall, and the second Italian lockdown began on November 6, 2020. The country was divided into 3 zones of yellow, orange, and red, based on restrictions of increasing severity. Campania was initially declared a yellow zone and then moved to a red zone on November 15th with 111,187 positive cases and a total of 1029 deaths.

The forced isolation induced by lockdown during a COVID-19 pandemic has resulted in increased anxiety in the general population [8,9]. High levels of worry about the pandemic in patients with some chronic gastrointestinal (GI) diseases have also been highlighted [10-14], while there are no studies at present on the perception of COVID-19 in Ach patients and the impact of the COVID-19 lockdown on their upper GI symptoms. During these difficult months of restrictions, Telemedicine has gained increasing importance, in an attempt to improve patients’ clinical management. The aim of this study was to evaluate the perception of the COVID-19 pandemic in Ach patients and the impact of the COVID-19 lockdown on their upper GI symptoms, as well as their attitude towards Telemedicine.

Patients and methods

Participants

Sixty-four Ach patients followed by the outpatient clinic of the University of Salerno devoted to Rare Diseases were contacted by phone between 19th November and 3rd December 2020, during the Italian lockdown for the second COVID-19 wave. All patients had their upper GI symptoms evaluated by our medical staff, using the standardized questionnaire routinely adopted in our outpatient clinic. In addition, for those Ach patients who had completed the 36-Item Health Survey (SF-36) measuring the self-perception of QoL at least 6 months before, our medical staff also re-administered the SF-36 questionnaire by phone. Patients were then invited by email, WhatsApp or Facebook to fill in an online self-administered survey evaluating their perceptions of the COVID-19 pandemic and their nutritional status. Patients not able to access the online survey were helped by our medical staff to fill in the survey during another phone call. Informed consent was obtained for the collection and use of the data.

Online self-administered survey

A self-administered, internet-based structured survey on the Google platform was used to evaluate patients’ perception of the COVID-19 pandemic, nutritional status (using the Malnutrition Universal Screening Tool [MUST]), and attitude towards Telemedicine (Supplementary material). In the survey,

apart from demographic and clinical data, we inquired about more aspects of patients’ perception of COVID-19. The answers to questions 19 and 20—“How much are you worried because of the COVID-19 pandemic?” and “Do you think that COVID-19 information from social and mass media is excessive?”—were structured as a (0-100) visual analog scale (VAS). The answers to the remaining questions were structured as Yes, No and Don’t know.

MUST is a 5-step screening tool to identify patients’ nutritional status. It also includes management guidelines that can be used to develop a treatment program. The MUST score is based on 3 parameters: body mass index at presentation, percentage of total body weight loss over the last 3-6 months, and presence of acute disease over the last 5 days. A score of 0 is considered low risk, a score of 1 moderate risk, and a score of ≥ 2 high risk of malnutrition [15]. This tool is routinely used to evaluate the nutritional risk in Ach patients [16].

GI symptoms questionnaire

A previously published standardized questionnaire, routinely used in our outpatient clinic to assess the frequency (0 = absent; 1 = 2 days/week; 2 = 3-5 days/week; and 3 = 6-7 days/week), and the intensity (0 = absent; 1 = not very bothersome, not interfering with daily activities; 2 = bothersome, but not interfering with daily activities; and 3 = interfering with daily activities) of upper GI symptoms, was administered [13,17,18].

Upper GI symptoms were dysphagia for solids, dysphagia for liquids, regurgitation, heartburn, non-cardiac chest pain, ear, nose, throat symptoms, cough, odynophagia, water brash, belching, nausea, vomiting, upper abdominal bloating, upper abdominal distension, epigastric fullness, early satiety, epigastric pain, and epigastric burning. For each symptom, a frequency-intensity score was obtained, from 0 up to a maximum of 6.

The 36-Item Health Survey (SF-36) for measuring QoL

The SF-36 questionnaire consists of 36 items and includes 8 domains: physical functioning, role limitations due to physical health, bodily pain, general health, vitality, social functioning, role limitations due to emotional health, and mental health. These 8 domains form 2 broader health dimension scales: the physical (PCS) and mental (MCS) component scales. The SF-36 subscales and composite scores are presented as means and standard deviations, with higher scores indicating better health and wellbeing [19,20].

Statistical analysis

Frequencies, median and interquartile range, or means and standard deviations ($M \pm SD$) for continuous variables were computed. When appropriate, a χ^2 test to compare categorical data and analysis of variance (ANOVA) to compare continuous variables were used. The 0-100 VAS score was computed as

M±SD and expressed as “mild/a little” (<40; ★), “enough” (40-60, ★★), “much/very much” (>60, ★★★). The intensity/frequency scores of each GI symptom before the COVID-19 pandemic and during the second Italian lockdown were compared using Wilcoxon’s test for paired data. Significance was expressed at the level of P<0.05. SPSS for Windows (release 15.0; SPSS Inc.) was used for the statistical analysis.

Results

Fifty-four of the 64 patients (84.4%) answered the GI symptoms questionnaire, while 51 (79.7%) filled in the online survey. One patient was diagnosed with COVID-19 and was excluded from the study.

Demographic and clinical characteristics of the study population, mean Eckard score, mean time from diagnosis, treatments and comorbidities are reported in Table 1. Table 2 reports the mean scores of all the GI symptoms during the lockdown in all Ach patients.

Means and SDs of the VAS scores in response to questions 19-20 (“How much are you worried because of the COVID-19 pandemic?” and “How much do you think that COVID-19 information from social and mass media is excessive?”) were 72.8±27.1 and 63.0±31.0, respectively; 64.7% of patients scored their worry as much/very much and 56.9% did not believe that information about COVID-19 was excessive (Table 3).

In addition, Table 3 shows that 60% of patients believed they had a greater risk of COVID-19 infection because of their disease (question 22), 66% felt more tense and anxious about COVID-19 infection (question 24), 72% had more fear about going to crowded places (question 23) and 68% were worried about not receiving adequate care because of the pandemic (question 27). In contrast, the patients were not concerned about food or mask shortages (questions 25 and 26: 96% and 90%, respectively).

Moreover, patients who considered themselves more vulnerable to COVID-19 than the general population and who were more anxious about contracting the infection showed a significantly higher score for COVID-19 worry compared to those who considered themselves less vulnerable or anxious (79.7±27.6 vs. 62.5±23.6, P=0.027 and 80.9±19.6 vs. 57.1±33.1, P=0.002, respectively). The evaluation of MUST showed that 18% of patients had weight loss in the previous 3-6 months and only one patient had acute illness without nutritional intake, possibly due to his concomitant neurological disease (Congenital Bilateral Perisylvian Syndrome).

A further analysis was then performed in those Ach patients (n=29) who had not undergone any changes in medical or surgical treatment for at least one year before the COVID-19 pandemic. We compared the intensity/frequency scores of upper GI symptoms collected during the COVID-19 lockdown to those collected before the COVID-19 pandemic. There was a significant worsening of the intensity/frequency scores of regurgitation, heartburn, odynophagia, water brash and epigastric burning during COVID-19 lockdown (Wilcoxon test <0.05 in all cases) (Table 4 and Fig. 1). In addition, 65% of the selected Ach patients showed a weight increase.

Table 1 Demographic and clinical characteristics of the study population

Characteristics	Value
Number of survey answered/sent	51/64 (79.7%)
Female/Male, N (%)	17/33 (34/66)
Age (years), mean (SD)	61.02 (15.36)
Weight (kg), mean (SD)	74.4 (11.7)
BMI (kg/m ²), mean (SD)	25.7 (3.5)
Eckardt score, mean (SD)	3.0 (2.6)
Rural area, N (%)	11 (22.0)
Urban area, N (%)	39 (78.0)
Education degree, N (%)	
Primary school	13 (26.0)
Middle school	11 (22.0)
High school	21 (42.0)
University	5 (10.0)
Physical exercise, N (%)	
Not at all	31 (62.0)
A little	14 (28.0)
Yes, I use to walk	2 (4.0)
I train intensely	3 (6.0)
Time from diagnosis (years), mean (SD)	6.9 (7.9)
Types of therapy, N (%)	
Refused any therapy or waiting therapy	9 (18.0)
Calcium channel blockers	3 (6.0)
Botulinum toxin	6 (12.0)
Pneumatic dilatation	8 (16.0)
POEM	4 (8.0)
Heller’s myotomy	20 (40.0)
Comorbidities, N (%)	
Kidney problems	5 (10.0)
Diabetes	6 (12.0)
High cholesterol levels	15 (30.0)
Hypertension	12 (24.0)
Osteoporosis	8 (16.0)
Depression	4 (8.0)
Anxiety	14 (28.0)
Sleep disturbances	17 (34.0)
Gastrointestinal symptoms	6 (12.0)
Headache	9 (18.0)
Fatigue	7 (14.0)

BMI, body mass index; SD, standard deviation; POEM, peroral endoscopic myotomy

The PCS and MCS scales of the SF-36 questionnaire did not change significantly from before to during the COVID-19 lockdown (43.1±11.4 vs. 42.3±11.9 for PCS and 39.6±13.4 vs. 44.2±12.2 for MCS, P>0.05 in both cases). We also explored the propensity of Ach patients to receive the flu and the upcoming COVID-19 vaccine. Although only 28% of Ach patients underwent the recommended flu vaccination, 46% wanted to be vaccinated against COVID-19.

Finally, we evaluated Ach patients’ attitude toward Telemedicine; 76% declared interest and were in favor of using Telemedicine. This result is explained by the high percentage (54%) of them who were afraid to go to the hospital for a visit and the 68% of them who were worrying about not receiving

care as normal because of the COVID-19 pandemic. In addition, after the telephone interview, no patient required an urgent visit (Fig. 2).

Table 2 Intensity-frequency score of upper gastrointestinal symptoms during the COVID-19 lockdown in all patients with achalasia

Symptom	During COVID-19
Dysphagia for solids	3.0 (0.0-5.25)
Dysphagia for liquids	0.0 (0.0-4.0)
Regurgitation	2.0 (0.0-4.0)
Heartburn	0.0 (0.0-3.25)
Non-cardiac chest pain	2.0 (0.0-4.0)
ENT symptoms	0.0 (0.0-0.0)
Cough	0.0 (0.0-2.0)
Odynophagia	3.0 (2.0-5.0)
Water brash	1.0 (0.0-3.0)
Belching	0.0 (0.0-4.0)
Nausea	0.0 (0.0-0.0)
Vomiting	0.0 (0.0-0.0)
Upper abdominal bloating	0.0 (0.0-4.0)
Upper abdominal distension	0.0 (0.0-3.0)
Epigastric fullness	0.0 (0.0-4.0)
Early satiety	0.0 (0.0-0.0)
Epigastric pain	0.0 (0.0-3.0)
Epigastric burning	0.0 (0.0-3.0)

ENT, ear nose throat

Table 3 Online self-administered survey response

Questions	Response		
	★	★★	★★★
How much are you worried because of the COVID-19 pandemic?	13.7%	21.6%	64.7%
How much do you think that COVID-19 information from social and mass media are excessive?	25.5%	17.6%	56.9%

	(% of patients)		
	No	Yes	As much as first lockdown
Do you feel more worried compared to the first COVID-19 lockdown in March 2020?	40.0	48.0	12.0

	No	Yes	Don't know
	Do you think that you are at higher risk of COVID-19 infection because you have achalasia?	40.0	60.0
Do you feel disturbed or anxious about COVID-19 infection?	34.0	66.0	0.0
Are you worried to go into crowded places due to the possible loss of social distancing?	28.0	72.0	0.0
Are you afraid of food shortage during the COVID-19 pandemic?	96.0	4.0	0.0
Are you afraid of mask shortage during the COVID-19 pandemic?	90.0	10.0	0.0

Discussion

This is the first study demonstrating that the COVID-19 lockdown had an impact on the majority of patients with Ach, a rare disease. Specifically, a high percentage of Ach patients were much/very much worried because of COVID-19 pandemic. Those patients who felt themselves more tense and anxious and believed they had a higher risk of infection because of their disease showed significantly higher scores for

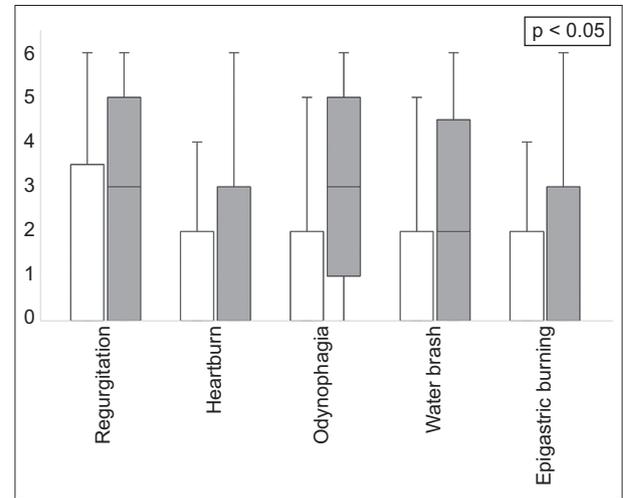


Figure 1 Box plot, median and percentiles of significant upper gastrointestinal symptoms before (□) and during (■) the COVID-19 lockdown in patients with achalasia (n=29) who had not undergone any change in medical or surgical treatment for at least one year before the COVID-19 pandemic

Table 4 Intensity-frequency score of upper gastrointestinal symptoms first and during the COVID-19 lockdown in patients with achalasia (n=29) who did not undergo any change in medical or surgical treatment at least one year before COVID-19 pandemic

Symptoms	First COVID-19	During COVID-19	P-value
Dysphagia for solids	4.0 (4.0-6.0)	4.0 (1.0-5.5)	0.088
Dysphagia for liquids	2.0 (0.0-5.0)	0.0 (0.0-4.5)	0.627
Regurgitation	0.0 (0.0-3.5)	3.0 (0.0-5.5)	0.015
Heartburn	0.0 (0.0-2.0)	0.0 (0.0-3.5)	0.015
Non-cardiac chest pain	2.0 (0.0-4.0)	0.0 (0.0-3.0)	0.826
ENT symptoms	0.0 (0.0-0.0)	0.0 (0.0-0.0)	>0.99
Cough	0.0 (0.0-4.0)	0.0 (0.0-2.0)	0.253
Odynophagia	0.0 (0.0-2.0)	3.0 (1.0-5.0)	0.001
Water brash	0.0 (0.0-2.0)	2.0 (0.0-4.5)	0.026
Belching	0.0 (0.0-4.0)	2.0 (0.0-4.0)	0.229
Nausea	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.197
Vomiting	0.0 (0.0-0.5)	0.0 (0.0-0.5)	>0.99
Upper abdominal bloating	0.0 (0.0-2.0)	0.0 (0.0-3.5)	0.418
Upper abdominal distension	0.0 (0.0-1.0)	0.0 (0.0 – 3.5)	0.531
Epigastric fullness	0.0 (0.0-2.0)	0.0 (0.0-4.0)	0.347
Early satiety	0.0 (0.0-2.0)	0.0 (0.0-0.0)	0.234
Epigastric pain	0.0 (0.0-0.0)	0.0 (0.0-1.0)	0.232
Epigastric burning	0.0 (0.0-2.0)	0.0 (0.0-3.0)	0.047

ENT, ear nose throat

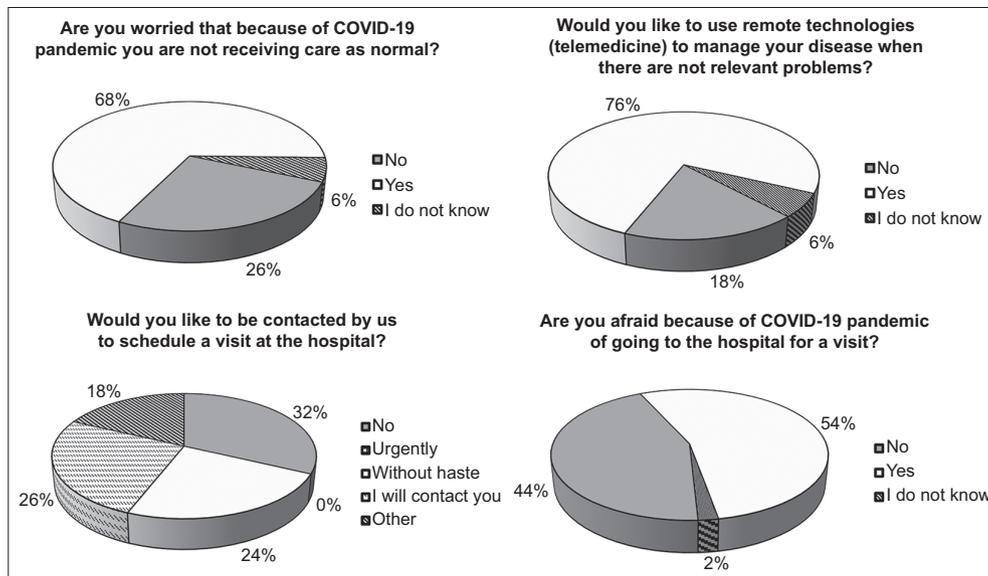


Figure 2 COVID-19 pandemic and telemedicine

fear of COVID-19 infection. Moreover, Ach patients who had not undergone any changes in medical or surgical treatment for at least one year before the COVID-19 pandemic reported a statistically significant worsening of regurgitation, heartburn, odynophagia, water brash, and epigastric burning during COVID-19 lockdown compared to the period before the pandemic. In general, Ach patients showed a positive attitude towards Telemedicine.

The psychological impact of the COVID-19 lockdown is an interesting result that emerges from our study. Numerous studies have found higher levels of anxiety and stress, which radically changed their daily lives, in patients with GI diseases [14] such as inflammatory bowel disease [12], eosinophilic esophagitis [10], and functional GI disorders [13] during the COVID-19 pandemic. During the lockdown in Italy, there was a ban on leaving the house except for reasons of absolute necessity, for example

the purchase of food or medicines. Another important aspect might be the fear of getting infected or infecting others; in fact, 72% were afraid to go to crowded places, such as supermarkets, because of the lack of social distancing. In addition, mass media and social media also play an important role in this context. The 24-h news about the deaths and risks from COVID-19 infection might have frightened people. Altogether, these factors might negatively impact one's daily activities, focusing one's thoughts continuously on the COVID-19 infection. It has already been shown that the loss of social relationships, the limitation of movements, the mass media, and many other aspects related to the COVID-19 lockdown, might lead to increased anxiety and stress in the general population [21].

To understand the impact of the COVID-19 lockdown on the GI symptoms of Ach patients, we selected those who had not undergone any changes in medical or surgical treatment for at least one year before the COVID-19 pandemic (patient's decision and/or treatment postponed due to the pandemic). We demonstrated a significant worsening of regurgitation, heartburn, odynophagia, water brash, and epigastric burning during the COVID-19 lockdown. We did not study the underlying mechanisms to explain the worsening of these symptoms; however, they might be attributed to several factors. In Ach, esophageal symptoms can be directly related to underlying esophageal motility impairment; however, it is well known that psychological and cognitive factors such as anxiety contribute to and modulate the symptom generation process, accounting for some of the disconnect between patients' symptom reports and objective measures of esophageal function [22]. Moreover, the radical lifestyle changes imposed by the restrictive measures applied during the COVID-19 lockdown should be taken into account. In fact, only 10% of Ach patients engaged in moderate/intense physical activity. Limitation of outdoor physical activity and a more sedentary lifestyle, as well as an increase in body weight, might influence symptoms associated with gastroesophageal reflux disease. In fact, 65% of the 29 selected Ach patients showed a weight increase during the COVID-19 lockdown.

Despite the worsening of several upper GI symptoms, there were no significant differences in SF-36 scores, either MCS or PCS, in Ach patients during the COVID-19 lockdown. The QoL before COVID-19 lockdown in our patients did not differ from that in other Ach series [23].

A very interesting aspect is the high percentage of patients who were in favor of the use of Telemedicine. According to the WHO definition, "Telemedicine" is "the delivery of healthcare services at a distance using electronic means for the diagnosis of treatment, prevention of disease and injuries, research and evaluation, and education of health care providers" [24,25]. Previous studies at our outpatient clinic had successfully evaluated the application of Telemedicine for other GI conditions during the first Italian lockdown [11,26]. However, studies on Telemedicine in Ach patients are lacking. We tried to take advantage of the COVID-19 lockdown crisis to introduce a Telemedicine service for this condition, which is a rare and complex disease that requires adequate follow up. Our GI symptoms questionnaire allowed us to screen for a possible relapse and to contact those patients who required a more in-depth clinical evaluation. The results of our survey showed the

great interest of Ach patients in this new technology because they felt "in touch" with their dedicated staff.

Our study had strengths and limitations. This was the first study to examine the impact of a stressful event such as the COVID-19 lockdown on psychological aspects and upper GI symptoms in Ach patients; thus, it could be considered a proof-of-concept study regarding the impact of a stressful event on GI symptoms. Secondly, a series of standardized and validated questionnaires were used to assess the GI symptoms, QoL and nutritional status of Ach patients. Thirdly, we performed the study as soon as the COVID-19 lockdown occurred, and when there was no information about how long it was going to last. Lastly, this study, to our best knowledge, is the first to explore attitudes towards Telemedicine in a group of patients affected by the rare disorder Ach. However, there are several limitations. Firstly, the small sample size might have impacted the significance of several results, although we have to take into account that Ach is a rare disease. Secondly, the observational design of the study, which was conducted only at our center. Thirdly, the lack of assessment of anxiety and stress before the COVID-19 lockdown. Finally, although we used an *ad hoc* questionnaire that was previously used in other surveys [10-13,26] to assess the impact of the COVID-19 lockdown, it has not yet been validated.

In conclusion, COVID-19 pandemic allowed us to evaluate the impact of lockdown on psychological aspects and upper GI symptoms in patients with Ach, as well as to test the use of Telemedicine in the follow up of this disease. Further studies will be needed to assess the psychological aspects of this rare disease.

Summary Box

What is already known:

- Patients with achalasia suffer from poor nutritional status and impaired quality of life.
- COVID-19 pandemic has significantly influenced anxiety and stress, both in the general population and in patients with some chronic gastrointestinal diseases
- There are no studies on the perception of COVID-19 in patients with achalasia and the impact of COVID-19 lockdown on their upper gastrointestinal symptoms

What the new findings are:

- Patients with achalasia who felt themselves more tense and anxious and believed they had a greater risk of infection because of their disease showed a significantly higher score for fear of COVID-19 infection
- Patients with achalasia reported a statistically significant worsening of regurgitation, heartburn, odynophagia, water brash and epigastric burning during the COVID-19 lockdown
- Patients with achalasia showed a positive attitude towards Telemedicine

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Supplementary material



COVID-19 Survey Achalasia Disease

Informed Consent I agree



Coronavirus SARS-CoV-2 epidemic is interfering with everyone's life. We ask you to answer a questionnaire about the interference of the present epidemic on your life. The questionnaire is not anonymous to allow us to contact you in case of a visit request.

1. **Gender**
Man – Woman - I prefer not to define myself
2. **Date of birth**
3. **Current weight in kg**
4. **Did you notice an unplanned weight loss during the past 3-6 months?**
5. **If so, how many kg did you lose?**
6. **Are you acutely ill and there has been no nutritional intake for more than 5 days?**
7. **Height in cm**
8. **The city where you live**
9. **Do you live in an urban or rural area?**
Urban area – Rural area
10. **Education degree:**
Primary school
Middle school
High school
University
11. **Do you practice physical activity?**
Not at all
A little
Yes, I use to walk
I train intensely
12. **Date of Achalasia diagnosis**
13. **Type of therapy:**
Nothing
Calcium channel blockers
Botulinum toxin
Pneumatic dilatation
POEM
Heller's myotomy
14. **Are you affected by the following diseases?**
Kidney problems
Diabetes
High cholesterol levels
Hypertension
Osteoporosis
Depression
Anxiety
Sleep disturbances
Gastrointestinal symptoms
Headache
Fatigue
15. **Did you undergo the seasonal flu vaccination?**
Yes - No
Specify why
16. **Have you been diagnosed with COVID-19 infection (i.e. using nasopharyngeal tampon)?**
Yes - No
17. **If you have been diagnosed with COVID-19 infection, what kind of symptoms did you experience?**
Nothing
Headache
Loss of taste/smell
Fever
Muscle pain
Gastrointestinal symptoms
Shortness of breath
18. **How much are you worried because of the COVID-19 pandemic?**
Not at all _____
_____very much
0 100
19. **How much do you think that COVID-19 information from social and mass media are excessive?**
Not at all _____
_____very much
0 100

20. **Do you feel more worried compared to the first COVID-19 lockdown in March 2020?**
Yes - No - As much as first lockdown
21. **Do you think that you are at higher risk of COVID-19 infection because you have Achalasia?**
Yes - No - I do not know
22. **Are you worried to go into crowded places for example supermarket or food shops due to the possible loss of social distancing?**
Yes - No - I do not know
23. **Do you feel disturbed or anxious about COVID-19 infection?**
Yes - No - I do not know
24. **Are you afraid of food shortage during the COVID-19 pandemic?**
Yes - No - I do not know
25. **Are you afraid of mask shortage during the COVID-19 pandemic?**
Yes - No - I do not know
26. **Are you worried that because of COVID-19 pandemic you are not receiving care as normal?**
Yes - No - I do not know
27. **Are you afraid because of COVID-19 pandemic of going to the hospital for a visit?**
Yes - No - I do not know
28. **Would you like to use remote technologies (Telemedicine) to manage your disease when there are not relevant problems?**
Yes - No - I do not know
29. **Would you like to be contacted by us to schedule a visit at the hospital?**
No
Urgently
Without haste
I will contact the hospital
Other
30. **Would you like to undergo a COVID-19 vaccination, when it will be available?**
Yes - No - I do not know
31. **Do you have any questions or suggestions?**