

COVID-19 lockdown and seasonal allergic rhinitis: our experience in 40 patients

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Abstract. *Introduction:* The aim of this article was to study the course of seasonal allergic rhinitis during COVID-19 lockdown to understand if being quarantined at home for a long time can constitute a protective factor for allergic patients. *Materials and methods:* Telehealth consultations were performed by the departments of Otolaryngology of Foggia and Bari University Hospitals. Patients affected by cypress pollen allergy took part in a phone interview and were asked about their sinonasal symptoms during the COVID-19 lockdown, by answering the sinonasal outcome test (I-SNOT-22) questionnaire. Further data concerning the medications used to treat allergy and the number of days per month in which they were used were collected. The responses about the COVID-19 lockdown were compared to those obtained by the same patients in our clinics the previous year. The statistical analysis was executed by using the paired sample t-test and the Bartlett test considering as significant values with p values <0.05. *Results:* Forty patients affected by cypress pollen allergy visited at Foggia and Bari University Hospitals were enrolled in this study. All I-SNOT-22 scores concerning the COVID-19 lockdown were lower than those of the previous year; moreover, 18 (81.8%) clinical parameters were statistically significant (p<0.05). Also, in regard to the treatment, results about COVID-19 lockdown were overall better than those of 2019, with 50% (n=3) of the investigated drugs, reporting statistical significance (p<0.05). *Conclusions:* The present study was able to evidence the fundamental role of primary prevention in Allergy. Paradoxically, the home quarantine ordered by the Italian Government appeared to be an effective measure not only in the fight against COVID-19 but also against pollen exposure. (www.actabiomedica.it)

Key words: Coronavirus, hypersensitivity, seasonal allergic rhinitis, pollen, cypress, SNOT-22, quarantine, therapy.

Introduction

Italy was the first European country to be hit by the COVID-19 pandemic, which has already profoundly impacted the way of living of the global population (1).

Although rhinology is now in the spotlight with the latest publications about smell and taste impairment in COVID-19 patients (2,3), allergology is ap-

parently in the background. However, allergic rhinitis will continue to be one of the most common diseases even in the post-COVID-19 era (4,5) and there are many questions that need further research. For example, an interesting point would be to investigate the influence that the new daily habits and restrictions have on the clinical history of the various allergic diseases.

Therefore, the aim of this article was to study the course of seasonal allergic rhinitis during COVID-19

lockdown in order to understand if being quarantined at home for a long time, in addition to being the best measure to control the spread of SARS-CoV-2 infection, can constitute a protective factor for allergic patients.

Materials and Methods

The first step in planning this research was to check the pollen count (<http://www.pollinieallergie.it>) of the two months of study (March 2019/ March 2020). In the Puglia region outdoor ambient pollen levels were characterized by high concentration (> 90 grains per m³ of air) of 'Cupressaceae' (Cypress family). Values in 2020 coincided with those in 2019, both as regards the pollen concentration (average levels oscillating between 100 and 380 grains per m³ of air) and the duration (pollen peak levels around the 9th week of the year).

In accordance with the guidelines from the Higher Institute of Health (ISS) and due to the sanitary restrictions, telehealth consultations (6) were performed by the departments of Otolaryngology (ORL) of Foggia and Bari University Hospitals. Patients affected by cypress pollen allergy confirmed by skin prick test took part in a phone interview and were asked about the sinonasal symptoms during the COVID-19 lockdown, from March 9th to April 9th, 2020, by answering the sinonasal outcome test (I-SNOT-22) questionnaire (7–9). This last questionnaire was chosen as a statistically significant correlation ($p < 0.001$) was demonstrated between SNOT-22 and Rhinitis Control Assessment Test (RCAT) (10,11).

Further data concerning the medications used to treat allergy and the number of days per month in which they were used were collected. The responses about the COVID-19 lockdown were compared to those obtained by the same patients in our clinics the previous year, from March 9th to April 9th, 2019. After a verbal explanation, all participants gave their oral informed consent to participate in phone interviews. Patients in essential jobs, such as health workers, security guards, policemen, and transport workers, were not included in this study since they had to go out for work even during the Italian lockdown. Other exclusion criteria were: poliallergic patients, subjects with additional non-allergic rhinitis, patients with uncontrolled symptoms of asthma, as

well as subjects who underwent immunotherapy and/or changed medications.

The assessment of significant differences among the means of continuous variables was calculated by using the paired sample t-test considering as significant values with p values <0.05. The Bartlett test was used to assess the distribution of the variables. P values <0.05 were considered significant. Data analyses were carried out using STATA-MP software, version 15.

This research was approved by the Institutional Review Board of the Department of Otolaryngology of the University Hospital of Foggia and conducted in accordance with Guideline for Good Clinical Practice and the ethical principles originating in the Declaration of Helsinki.

Results

Twelve patients who fulfilled the inclusion criteria did not answer and, after two attempts to reach them by phone, were therefore excluded. Finally, forty patients affected by cypress pollen allergy (18 males, 22 females; median age 36.5) visited at the Otolaryngology (ORL) Departments of Foggia and Bari University Hospitals were enrolled in this study. Out of this group, 14 (35%) individuals were allergic to multiple allergens, but, when the investigation was performed, it was not the season of the other pollen allergies. Eleven subjects (27.5%) were atopic and 14 (35%) were familiar for the disease. As concerns the comorbidities, 11 (27.5%) subjects were asthmatic and 3 (7.5%) had aspirin sensitivity. None of the patients had nasal polyps.

Our results confirmed that the lockdown ordered by the Italian government has positively influenced the clinical history of patients with seasonal allergic rhinitis. All I-SNOT-22 scores concerning the COVID-19 lockdown were lower than those of the previous year (Table 1); moreover, 18 (81.8%) clinical parameters were statistically significant ($p < 0.05$).

Also, in regard to the treatment, results about COVID-19 lockdown were overall better than those of 2019 (Table 2), with 50% ($n=3$) of the investigated drugs, such as "systemic antihistamines", "topical corticosteroids" and "nasal decongestants", reporting statistical significance ($p < 0.05$).

Table 1. Sinonasal outcome test (I-SNOT-22) responses during COVID-19 lockdown and during the same time frame in 2019 (Abbreviations: SD: standard deviation; CI: confidence interval).

I-SNOT-22	Year 2019*		Year 2020**		p-value
	Mean score±SD	95% CI	Mean score±SD	95% CI	
Need to blow nose	3.1±1.2	2.7-3.4	1.9±1.4	1.5-2.3	0.0000
Sneezing	3.3±1.1	2.9-3.6	2.1±1.3	1.6-2.5	0.0000
Runny nose	3±1.3	2.6-3.4	1.6±1.1	1.2-1.9	0.0000
Nasal obstruction	2.9±1.4	2.5-3.4	1.8±1.4	1.3-2.2	0.0002
Loss of smell or taste	1.6±1.4	1.2-2.0	1.0±1.1	0.6-1.3	0.0123
Cough	1.6±1.3	1.1-2.0	0.9±1.0	0.5-1.2	0.0070
Postnasal discharge	2.0±1.6	1.4-2.5	0.9±0.8	0.6-1.1	0.0001
Thick nasal discharge	1.6±1.2	1.2-1.9	0.7±0.8	0.4-0.9	0.0001
Ear fullness	1.3±1.2	0.9-1.7	0.7±0.9	0.4-1.0	0.0038
Dizziness	1.6±1.4	1.1-2.0	0.8±1.2	0.4-1.2	0.0045
Ear pain	1.0±1.3	0.6-1.4	0.6±1.0	0.3-1.0	0.0803
Facial pain/pressure	1.5±1.5	1.1-2.0	0.9±1.1	0.5-1.2	0.0143
Difficulty falling asleep	1.8±1.5	1.3-2.3	1.1±1.5	0.7-1.6	0.0230
Waking up at night	1.8±1.6	1.3-2.3	1.4±1.5	0.9-1.8	0.1084
Lack of good night's sleep	2.2±1.8	1.6-2.7	1.5±1.5	1.0-2.0	0.0413
Waking up tired	2.2±1.7	1.6-2.7	1.4±1.5	0.9-1.9	0.0138
Fatigue	1.9±1.5	1.4-2.3	1.2±1.2	0.8-1.6	0.0143
Reduced productivity	1.6±1.5	1.1-2.1	0.8±1.2	0.4-1.2	0.0085
Reduced concentration	1.6±1.5	1.1-2.1	1.0±1.3	0.5-1.4	0.0234
Frustrated/restless/irritable	1.7±1.6	1.2-2.2	1.5±1.5	1.0-2.0	0.2560
Sad	1.4±1.5	0.9-1.9	1.1±1.2	0.7-1.5	0.1626
Embarrassed	1.4±1.6	0.9-1.9	0.8±1.2	0.4-1.2	0.0306

* From March 9th to April 9th, 2019. ** From March 9th to April 9th, 2020

Table 2. Medications to treat seasonal allergic rhinitis and the number of days per month in which they were used during COVID-19 lockdown and during the same time frame in 2019 (Abbreviations: SD: standard deviation; CI: confidence interval).

Medication use	Year 2019*		Year 2020**		p-value
	Mean days per month±SD	95% CI	Mean days per month±SD	95% CI	
Systemic antihistamines	12.3±11.5	8.6-16.0	4.5±8.8	1.6-7.3	0.0005
Topical corticosteroids	7.4±10.8	4.0-10.9	3.5±8.5	0.8-6.2	0.0363
Steroid plus antihistamines nasal spray	1.6±5.8	-0.2-3.4	1.0±4.8	-0.6-2.5	0.3001
Systemic corticosteroids	0.8±2.2	0.1-1.5	0.2±1.0	-0.1-0.5	0.0566
Nasal decongestants	2.2±4.9	0.6-3.8	0.3±1.0	-0.1-0.6	0.0083
Bronchodilators	1.0±3.2	0.0-2.0	0.5±2.4	-0.3-1.3	0.2190

* From March 9th to April 9th, 2019. ** From March 9th to April 9th, 2020

Discussion

Our data evidenced the general well-being that patients have referred and are consistent with the reduced pollen exposure. The restrictions imposed by the lockdown are in accordance with the indications suggested by the ARIA (Allergic Rhinitis and its Im-

pact on Asthma) guidelines (4), according to which limiting pollen exposure in both indoor and outdoor environments is the most effective primary preventive measure in subjects with respiratory allergies.

Conversely, as evidenced by a study recently published by our group (12), the clinical history of patients with dust mite allergy was negatively influenced by the

COVID-19 restrictions, which forced patients to stay at home for a long time with increased allergen exposure. Also, it would be interesting to see what is going to happen to patients affected by other seasonal pollen allergies (i.e., gramineous, olive pollen etc.) during the next months, in order to release international guidelines and integrated strategies to improve the quality of life of allergic patients during the COVID-19 pandemic and limiting the costs for the health system already under pressure during these unprecedented times. This should be warranted also for pediatric patients, since the etiology of asthma and allergic rhinitis are influenced by genetic and environmental factors as well (13).

Even when the lockdown is going to be lifted, allergic patients will probably benefit from the use of masks. In fact, masks help to create an oronasal barrier and, in addition to being an effective preventive measure for COVID-19, they can protect allergic patients from pollen exposure. Although the study period was short enough to evaluate any reductions in infectious complications, the use of masks may also induce a decrease in infectious rhinitis that may support the general well-being of allergic patients.

Certainly, the lockdown represents an exceptional experimental model, but it also has some limitations. In fact, Italian hospitals were active only for urgent/emergent procedures and more objective measures such as laboratory findings could not confirm the subjective improvement experienced by our patients.

Conclusions

Although the present study was carried out in an extraordinary context that no one would have ever expected, it was able to evidence the fundamental role of primary prevention in Allergology. Paradoxically, the home quarantine ordered by the Italian Government to all citizens appeared to be an effective measure not only in the fight against COVID-19 but also against pollen exposure. Environmental factors appeared to play a role of primary importance in the pathogenesis of allergic rhinitis and the design of “pollen free towns” should be considered in a future perspective. Additionally, telemedicine, mobile applications (14) and

phone counselling in cooperation with primary care physicians, which were effective strategies during the COVID-19 pandemic, should constitute the basis also of the Allergology of the post-COVID-19 era.

Ethical approval: The research was conducted in accordance with Guideline for Good Clinical Practice and the ethical principles originating in the Declaration of Helsinki.

Informed consent: All participants gave their informed consent to participate in this research study.

Conflicts of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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