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COVID-19 impact on asthmatic individuals: an analysis from an Indian survey

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Abstract

Background

Acute COVID-19 appears to have a complicated effect on asthmatics, being tempered by a number of interrelated disease-specific, demographic, and environmental variables. There is little information available on this group's longer-term impacts. In persons with asthma, we intended to evaluate COVID-19's effects and predictors of persistent symptoms.

Methods

We conducted a mixed methods study of the characteristics and experience of individuals reporting having had COVID-19 using data from an online India-wide survey of 4500 persons with asthma, conducted in October 2020.

Results

In contrast to those who did not report COVID-19 (n=471, 10.5 percent), the COVID-19 group did not differ by gender, race, or household income but did indicate higher inhaler use and worse asthma control. 56.1 percent of those with COVID-19 reported having a long COVID, while 20.2 percent were "unsure." In comparison to those without long COVID, those with long COVID were more likely to report increased inhaler use (67.8 percent vs. 34.8 percent), worse or much worse asthma management (59.6 percent vs. 25.6 percent), and breathing problems after their initial illness (73.7 vs. 34.8 percent, p0.001). There was no correlation between COVID and age, gender, race, or household income.

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Three major themes emerged from the analysis of free text survey responses: (1) varying COVID-19 intensity, duration, and recovery; (2) symptom overlap and interaction between COVID-19 and asthma; and (3) impediments to healthcare access.

Conclusions

After COVID-19, persistent symptoms are typical in asthmatics. To differentiate between COVID-19 symptoms and asthma, there are steps that need to be taken to provide proper access to healthcare, including clinical assessment and study.

Keywords: COVID-19, asthmatics, interrelated disease-specific

Introduction

COVID-19 has now been experienced by tens of millions of individuals, with significant related morbidity and mortality. Concerns about COVID-19's effects on asthmatics have been raised since other coronaviruses can lead to asthma attacks.[1-3] The pandemic's first response strategies concentrated on treating the acute stage of the illness, but as long COVID has grown in prominence, so too have the disease's long-term effects.[4,5] The majority of COVID-19 patients manage their disease at home, despite the fact that a rising number of studies describe COVID-19's longer-term effects on patients who have been admitted to hospitals.[6–9] Due to early capacity limitations, these people frequently haven't had access to confirmatory laboratory diagnostic tests.

The effects of COVID-19 on asthmatics are complicated and expected to differ based on a number of variables, such as the underlying phenotype and severity of their asthma,[10] how effectively it is managed, and the influence of medications such inhaled and oral corticosteroids. Certain elements may give a degree of protection against COVID-19, according to certain research.[11,12] However, some studies have indicated that persons admitted to hospitals with COVID-19 are more likely to have severe asthma, which raises the chance of needing critical care.[10,13-16] In order to guarantee that continued responses to the pandemic are appropriate, it is imperative to better understand how COVID-19 affects persons with asthma, both acutely and over time.[17]

Method

The Asthma Society of India assisted in regularly conducting nationwide online polls to determine how the COVID-19 epidemic was affecting persons with lung diseases and what might be done to stop it.[18,19] The surveys are disseminated through websites, social media accounts, and patient mailing lists. Data from the survey taken in October 2020 was utilised for this research, which concentrated on respondents who self-reported having COVID-19.

Statistical evaluation

Multiple-choice tests had ordinal variables that were coded. For the data in table 1, the Kruskal-Wallis test was used to assess for between group differences in the relevant listed variables, defining the groups (dependent variable) by self-reported COVID-19 status (not had COVID-19, not sure if had COVID-19, has had COVID- 19), which was treated as an ordinal variable. Age groups, gender, ethnicity, care cancellation yes/no, changes to inhaler use, and how asthma has been managed were all independent factors that included two or

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more categories. The answer to the question "Do you think you have had "long-COVID"?" was used to determine the status of long COVID.

Results

There were 6355 replies to the survey (as the survey was publicly accessible, a response rate cannot be reported). Three hundred and nine comments submitted on another person's behalf were eliminated, along with 1546 responses from individuals who did not have asthma (or another chronic respiratory disease or unspecified illness). 4500 replies were left, and 471 (10.5%) of them were from persons who self-reported having COVID-19

Table 1 Characteristics of survey respondents

	All survey respondents (n=4500)	Not had COVID-19 (n=3036)	Not sure if had COVID-19 (n=972)	Had COVID-19 (n=471)	P value
Age	N (%)				
29 and under	182 (4.09)	122 (4.06)	40 (4.14)	19 (4.09)	
30–39	410 (9.20)	260 (8.65)	95 (9.83)	54 (11.64)	
40–49	891 (20.00)	541 (18.00)	235 (24.33)	112 (24.14)	
50–59	1270 (28.51)	840 (27.95)	280 (28.99)	142 (30.60)	
60–69	1085 (24.35)	770 (25.62)	211 (21.84)	101 (21.77)	
70 and above	617 (13.85)	472 (15.71)	105 (10.87)	36 (7.76)	p<0.001
Gender					
Female	3618 (80.79)	2442 (80.86)	778 (80.21)	382 (81.80)	
Male	856 (19.12)	577 (19.11)	190 (19.59)	84 (17.99)	
Other	4 (0.09)	1 (0.03)	2 (0.21)	1 (0.21)	p=0.91
Ethnicity					
Indian origin	4301 (96.41)	2909 (96.77)	930 (96.07)	444 (94.67)	p=0.28
Care cancelled					
Reported that regular care (eg, an annual review) for my asthma at the GP has been cancelled	902 (20.04)	613 (20.19)	193 (19.86)	93 (19.75)	p=0.98
During lockdown, how has your reliever inhaler use changed?					
I have used it more than usual	1689 (39.96)	1031 (35.99)	413 (45.64)	238 (54.34)	
I have used it at about the same rate	1824 (43.15)	1332 (46.49)	355 (39.23)	128 (29.22)	
I have used it less than usual	587 (13.89)	409 (14.28)	116 (12.82)	60 (13.70)	
I do not have a reliever inhaler	127 (3.00)	93 (2.25)	21 (2.32)	12 (2.74)	p<0.001
Since the start of lockdown, how have you been managing your asthma?					
Much worse than usual	324 (7.22)	161 (5.32)	84 (8.67)	77 (16.42)	
A bit worse than usual	831 (18.52)	502 (16.58)	218 (22.50)	107 (22.81)	
About the same	2358 (52.44)	1702 (56.21)	448 (46.23)	197 (42.00)	
A bit better than usual	584 (13.02)	401 (13.24)	129 (13.31)	51 (10.87)	
Much better than usual	390 (8.69)	262 (8.65)	90 (9.29)	37 (7.89)	p<0.001

Table 2 Characteristics of people with asthma who reported having had COVID-19

	All with COVID-19 (n=471)	Long COVID (n=261)	Not long COVID (n=210)	P value
Age	N (%)			
29 and under	19 (4.09)	12 (4.67)	6 (2.99)	

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30–39	54 (11.64)	24 (9.34)	28 (13.93)	
40–49	112 (24.14)	65 (25.29)	45 (22.39)	
50–59	142 (30.60)	78 (30.35)	64 (31.84)	
60–69	101 (21.77)	57 (22.18)	43 (21.39)	
70 and above	36 (7.76)	21 (8.17)	15 (7.46)	p=0.795
Gender				
Female	382 (81.97)	212 (82.17)	166 (82.18)	
Male	84 (18.03)	46 (17.83)	36 (17.82)	p=0.998
Ethnicity				
Indians	444 (94.67)	245 (94.59)	194 (95.10)	
Ethnic minority	25 (5.33)	14 (5.41)	10 (4.90)	p=0.808
Total annual household income				
Below 2 Lacs INR	116 (25.00)	63 (24.42)	53 (26.50)	
2–3 Lacs INR	90 (19.40)	54 (20.93)	36 (18.00)	
3.1–4 Lacs INR	53 (11.42)	30 (11.63)	21 (10.50)	
4.1–7 Lacs INR	74 (15.95)	41 (15.89)	31 (15.50)	
Above 7 Lacs INR	31 (6.68)	8 (3.10)	21 (10.50)	
Rather not say	100 (21.55)	62 (24.03)	38 (19.00)	p=0.156
Nation				
Indian	379 (80.98)	209 (80.38)	167 (82.67)	

Patient encounter

Following analysis of survey data, three major themes regarding people's experiences following COVID-19 emerged.

1. Variable severity, duration, and recovery from COVID-19
2. The COVID-19 and asthma symptoms overlap and interact.
3. Obstacles to receiving medical care.

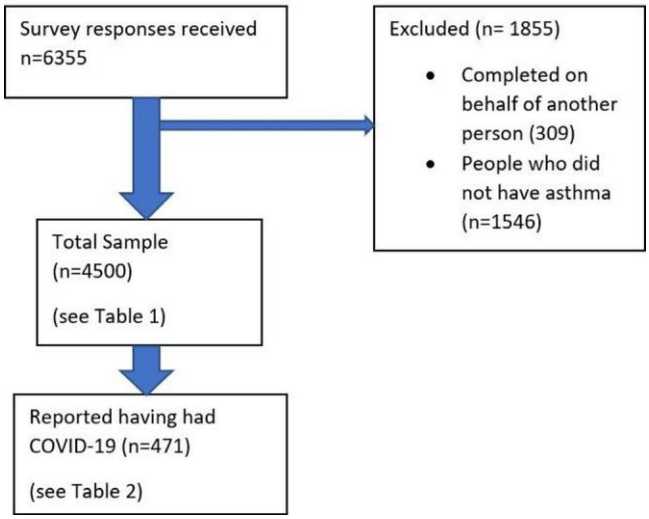

Figure 1 Participant flow diagram.

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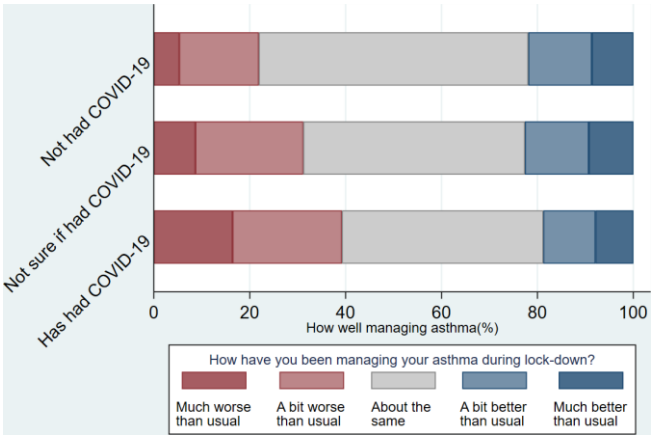
Figure 2 Self-reported asthma management by COVID-19 status.



The severity and duration of symptoms described varied considerably between people. Despite many people reporting a quick return to normalcy following COVID-19, almost half continued to have symptoms weeks to months later. A wide range of cases were reported, from those who were asymptomatic (found during screening) or believed they had only a very mild disease during the acute phase—"The only symptoms I had were loss of taste and smell" (female, aged 30-39), for example—to those requiring admission to an intensive care unit.

The course of recovery also varied greatly, with relapses occurring regularly, being described as "slow and unpredictable" by a woman in her 40s or 50s and recurrent worsening of symptoms following early improvements as "it comes and goes in waves" by the same woman.

Discussion

According to the findings of this significant mixed-methods study, patients with asthma who have undergone COVID-19 often report using their relief inhalers more frequently and managing their asthma poorly. Although age, gender, ethnicity, and household income have an impact on the risk of developing acute COVID-19, they do not predict the occurrence of long COVID, which is experienced by about half of those surveyed.[15] Each person's experience with COVID-19 was highly variable in terms of the severity, symptoms, and course of the disease. The symptoms of COVID-19 overlapped and frequently exacerbated those of asthma, making it difficult for sufferers to comprehend their symptoms and choose the best course of treatment.

Significance Of The Results

Although there is an expanding corpus of research on the acute stage of COVID-19, the longer-term experience of recovery is still little-studied.[6] To our knowledge, this is the first study to investigate this in asthmatic patients using a mixed methods approach. The ongoing effects of COVID-19 on asthma and breathlessness control have significant management ramifications. These findings imply that COVID-19-related prolonged symptoms may be more common among asthmatics, however confirmation would need to come from more research comparing asthmatic and non-asthmatic groups. It is unknown how much the prolonged symptoms described here are caused by one of the several

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pathogenic processes associated with chronic COVID,9 destabilized asthma, or a combination of variables.

Conclusion

COVID-19 is linked to poorer asthma control and extended symptoms in many asthmatics. It might be challenging to differentiate between COVID-19-related symptoms and asthma symptoms since post-COVID experiences are so diverse. Distress can result from both difficulties in obtaining proper medical treatment and a failure to recognise patients' conditions.

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