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**Hriday Gondalia**

Student, Kodaikanal  
International School,  
Kodaikanal, Tamil Nadu, India

## Observation of different symptoms associated with COVID-19

**Hriday Gondalia**

### Abstract

The SARS CoV 2 (COVID-19) pandemic which started in 2019 has spread throughout the world with newer mutations and variants of concern identified every few days. Essentially the symptoms remain the same but this study aims to observe the prevalence of Covid-19 symptoms in participants in India. Identifying newer symptoms of the infection may pave the way to prevent Post covid-19 complications (upto 45 days) as well as long covid-19 complications as they are exceedingly debilitating.

This is a prospective observational study wherein subjects diagnosed Covid-19 positive from Jan – Mar 2021 were enrolled. We included subjects aged 18 – 75 years who could answer the questionnaire independently.

Our findings show new symptoms reported that were not reported to a greater extent in the first wave of the pandemic in 2020 (As reported on <https://www.mygov.in/covid-19>). We also observed a difference in the extent of symptoms reported observed in male and female subjects.

Further studies are required to verify the difference observed and to associate the symptoms reported with post covid-19 complications and long covid-19 complications.

**Keywords:** SARS CoV 2 (COVID-19) pandemic, post covid-19 complications

### 1. Introduction

The SARS CoV 2 (COVID-19) pandemic, which emerged in Wuhan, China, in December 2019 as China reported an outbreak of pneumonia cases by unknown causes. Many of the initial cases were linked to the Huanan seafood market, where aquatic and live animals were sold. On further investigation using next-generation sequencing, a new betacoronavirus was found from the lower respiratory tract samples of these patients, 2019 novel Coronavirus (2019 - nCov). The virus when observed under electron microscope had a diameter of 60 to 140 nm with characteristic spikes of 9 to 12 nm, similar to the Coronaviridae family [1]. Phylogenetically, the novel coronavirus was found to be more similar to two bat derived coronavirus strains (~88% similarity) than coronaviruses which infect humans including SARS (~79% similarity) and MERS (~50% similarity) [2]. The initial spread of COVID-19 was caused by zoonotic transmission due to the exposure of initial patients to the wet market. However, by the beginning of 2020 the number of patients who developed the disease without any exposure to the market started to increase; this resulted in healthcare workers suggesting that COVID-19 spread from person to person. The basic reproduction number (R0) is the expected number of secondary cases that could arise from one case in a susceptible population. R0 is the essence of infectious disease epidemiology and indicates the risk of an epidemic spread. Most studies have estimated the R0 for SARS-CoV2 to be within a range of 2.0 to 3.0 [3].

Our results show that the incubation period falls within range of 2-14 days with 95% confidence and has a mean of around 5 days when approximated using the best-fit lognormal distribution [4].

COVID-19 has now spread to 220 countries and infected nearly 161,000,000 individuals of all ages as of 14 May 2021. Though most infected individuals exhibit mild symptoms including fever, upper respiratory tract symptoms, shortness of breath, and diarrhea, or are asymptomatic altogether, severe cases of infection can lead to pneumonia, multiple organ failure, and death. As of 14 May 2021, 3,000,000 deaths have directly been caused by COVID-19, but this number is expected to rise due to the ongoing pandemic [5].

**Corresponding Author:**

**Hriday Gondalia**

Student, Kodaikanal  
International School,  
Kodaikanal, Tamil Nadu, India

**2 Materials and Methods**

**2.1 Study protocol and patients**

This was a prospective observational study that included adult patients aged 18 and above who contracted Covid-19 between the time period Jan 2021 to Mar 2021 either hospitalised or home-quarantined. The aim of our preliminary study as to observe the different symptoms associated with Covid-19 and if there is a difference in the same as compared to those observed in the first wave of Covid-19 pandemic in India in 2020.

The symptoms were self-reported by the patients. A questionnaire was used for the same wherein the paper and online version of the form was shared to people in India who had Covid-19. The diagnosis of Covid-19 was confirmed in each patient by confirming that RT-PCR was done using nasopharyngeal and oropharyngeal swabs collected during the infection, that all labs performing RT-PCR were NABL accredited and kits used were ICMR approved. This was made sure of before collecting data from patients. All the participants gave consent to participate in the study.

Patients who did not complete the forms or left blank fields were not considered for analysis.

Patients who were HRCT positive and showed clinical symptoms of COVID-19 but were RT-PCR negative were also not considered for the study.

Patients were shared the questionnaire after they had recovered from Covid-19 infection and were stable enough to answer themselves. Patients who required Caregivers to answer for them were not considered for the study. Only

patients who were able to answer the questions first hand were selected for the study.

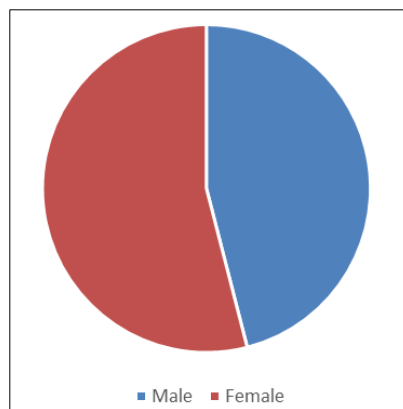
**2.2 Laboratory tests**

Since this was an observational study, no laboratory tests were performed neither data available from patient charts was reported.

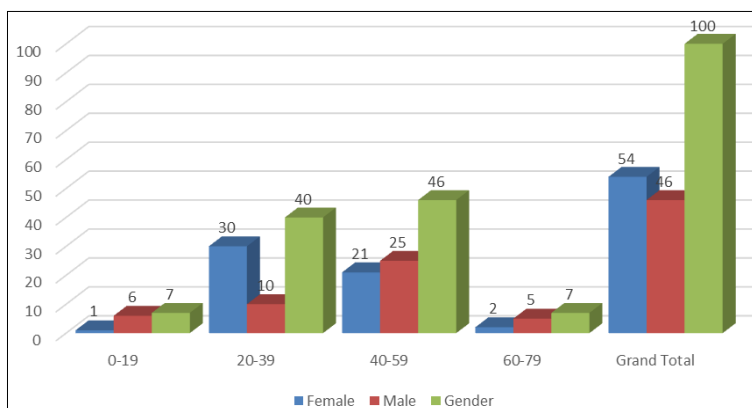
**3 Results and Discussion**

**3.1 Characteristics of Patients**

A total of 117 patients answered the questionnaire. However, data from only 100 could be utilised for analysis as the rest had not completed questionnaire.



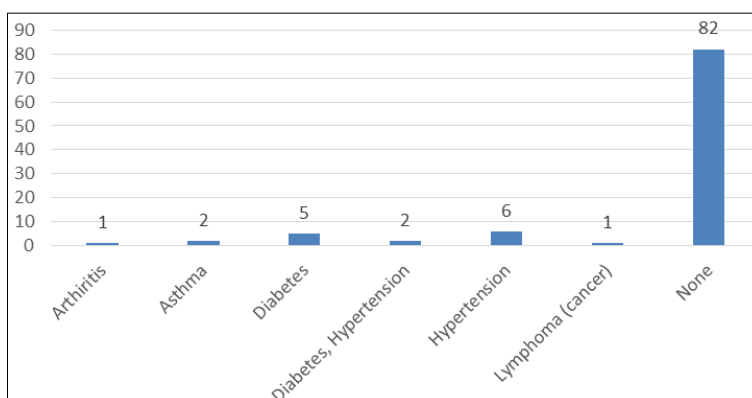
**Fig 1:** Count in male and female



**Fig 2:** Demography by Age/Gender

The age of patients ranged from 18 to 75 years (both inclusive) of which 7 were aged 60 and above, 49 had age between 40 to 60 years and 46 patients were aged between 18

to 39 years. Of the 100 patients, 54 were female and 46 were male patients.



**Fig 3:** Count of Comorbidity

Of the 100 patients, 18 patients had atleast one pre-existing comorbidity, most commonly hypertension 6 patients followed by diabetes 5 patients, 1 had Arthritis, 1 had

Lymphoma, 1 had Thyroid disorder and 2 had Asthma and 2 had both Diabetes and hypertension.

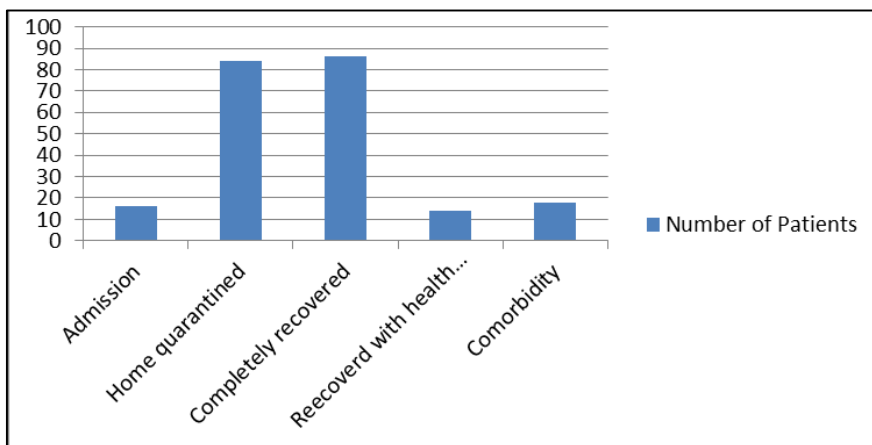


Fig 4: Number of patients

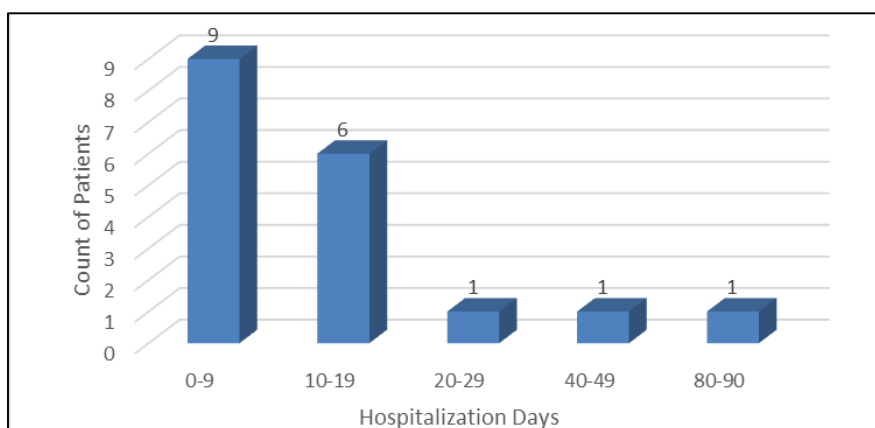


Fig 5: Show the Count of patients and hospitalization days

Of the 18 patients who had pre-existing comorbidities it was observed that atleast 10 had to be hospitalised. It was also observed that patients with pre-existing comorbidities experienced symptoms for longer duration as opposed to otherwise healthy patients. The average number of days symptoms were experienced by this group was 10 days with the range from as low as 4 days to as long as 90 days (3 months) even after patient has been treated for Covid-19. Patient who reported health issue ongoing at 90 days had only diabetes as a comorbidity.

It was also observed that 7 of these 18 patients did not recover completely and had some on-going health issues related to Covid-19.

Of the 18 patients, 10 had to be hospitalised and the rest were home quarantined. It was also observed that Caregivers of these patients were also found to be positive with Covid-19 for 10 of the 18 patients with the average days to testing positive was 2.5 days.

Of the 18 patients, only 4 were female patients of which 1 had on-going health issue after recovering from Covid-19.

Patients with co-morbidities had early onset of symptoms as compared to healthy subjects with an average of 2 days prior to them testing positive for Covid-19.

Fever and cough were the symptoms observed first by 7 and 6 patients followed by weakness in 2, diarrhoea, backpain and loss of smell in 1 patient each. Weakness was observed to be

the symptom to last more than a week in 11 of 18 patients, followed by cough in 5 and fever in 4.

Interestingly, sore throat was observed in 2 of 18 patients as a symptom that lasted for more than 1 week following treatment for Covid-19.

**3.2 Patients with no co-morbidities but ongoing health issues after Covid-19 recovery**

Data collected from 82 patients with no co-morbidities were analysed of which 35 were male and 47 female. Of these, 3 male and 4 female subjects had ongoing health issues and had not recovered completely with symptoms lasting from 5 days to 90 days post treatment for Covid-19, weakness being the common symptom in all of them. 4 patients reported loss of taste, 3 reported loss of smell and 1 reported sore throat as lasting for more than 1 week.

Of the 7 patients who had ongoing health issues for longer duration only 2 were hospitalised and 5 of them had family members/ caregivers who got infected with an average duration of 3.4 days to get symptomatic and infected.

4 of the 7 patients reported Fever as their first symptom followed by Cough in 2 and Sore throat in 1.

**3.3 Patients with no co-morbidities and recovered completely**

32 Male and 43 female patients had completely recovered,

had no comorbidities. Fever was reported as the most common first symptom observed by Subjects with 27 reporting it, followed by cough -17, loss of taste- 8. 2 of the subjects reported diarrhoea as the first symptom and 4 reported sore throat as the first symptom. Of this group, Loss of taste lasted for more than 1 week for 17 of the subjects, followed by cough for 13, sore throat for 4, diarrhoea for 1 and others as described in the diagram below. Of the 75 subjects, it was observed that symptoms lasted for

as short as 1 day to as long as 60 days in subjects with an average of 7 days for a subject. Only 4 of the 75 subjects had to be hospitalised with the rest being home quarantined. For 40 of these subjects, their caregivers/ family members were found to be positive with Covid-19 with an average of 4 days after them being positive. On an average it was observed that subjects had their first symptom 2.7 days prior to testing positive for Covid- 19.

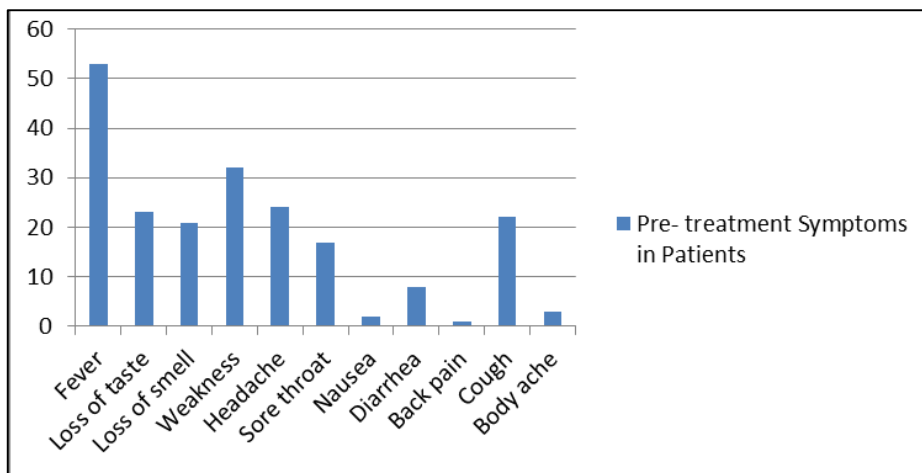


Fig 6: Pre- treatment symptoms in patients

The following figure discusses the prevalence of Covid-19 symptoms that was observed in studies all over the world.

Table 1: Other COVID- 19 associated symptoms

Author	Study design	Cohort Size	Other Symptoms					
			Fever	Cough	Headache	Arthralgia/Myalgia	Fatigue	Anorexia
Yan <i>et al.</i> (2020)	Retrospective (Cross- sectional)	262	41 (69.5%)	39 (66.1%)	25 (42.4%)	37 (62.7%)	48 (81.4%)	-
Leichien <i>et al.</i> (2020)	Prospective (Cross- sectional)	78	62 (72.9%)	42 (48.6%)	52 (60.0%)	36 (42.9%)	-	-
Leichien <i>et al.</i> (2020)	Retrospective (Cross- sectional)	417	48%	78%	45%	31%	-	-
Vaira <i>et al.</i> (2020)	Retrospective (Case Series)	72	69 (95.8%)	60 (83.3%)	30 (41.6%)	-	48 (66.7%)	-
Spinato <i>et al.</i> (2020)	Retrospective (Cross- Sectional)	202	113 (55.9%)	122 (60.4%)	86 (42.6%)	90 (44.6%)	-	110 (54.5%)
Carignan <i>et al.</i> (2020)	Retrospective (Case-Control)	134	50 (37.3%)	90 (72.4%)	87 (64.9%)	76 (56.7%)	-	75 (56.0%)
Giacomelli <i>et al.</i> (2020)	Retrospective (Cross- Sectional)	59	43 (72.8%)	22 (37.3%)	2 (3.4%)	3 (5.1%)	-	-
Wee <i>et al.</i> (2020)	Retrospective (Cross- Sectional)	870	21 (60%)	10 (28.5%)	-	-	-	-
Moein <i>et al.</i> (2020)	Retrospective (Case-Control)	60	46 (77%)	35 (58%)	22 (37%)	5 (8%)	-	2 (3%)
Klopfenstein <i>et al.</i> (2020)	Retrospective (Cohort)	114	40 (74%)	47 (87%)	44 (82%)	40 (74%)	50 (93%)	-
Mao <i>et al.</i> (2020)	Retrospective (Case-Control)	214	132 (61.7%)	107 (50%)	28 (13.1%)	-	-	68 (31.8%)
Kosugi <i>et al.</i> (2020)	Retrospective (Cohort)	253	16 (42.1%)	83 (57.2%)	20(52.6%)	8(21%)	7 (18.4%)	2 (5.2%)

Table -1 represents similar results to what we have observed from the result of this retrospective study- Figure- 4 Symptoms such as Fever, Head ache, Sore throat, Nausea, Diarrhea and Body ache saw a drastic decrease in the patients after treatment. Such reduction in the patients was observed from 62% to 50%. Symptoms such as Loss of taste, Loss of smell and Weakness saw an increase even after treatment. Such increase was

ranging from 14% to 17%. This can be ascertained to the fact that Covid symptoms might take upto 14 days to show completely. Cough was however a symptom which saw the least decrease at 10% even after taking the treatment. There was however difference in the prevalence of symptoms observed in males and females as is evident by the table below.

**Table 2:** Show the symptoms female and male patients

	Symptoms in no. of Female patients	% in Female	Symptoms in no. of Male patients	% in Male
Fever	22	40.74	31	67.39
Loss of taste	11	20.37	12	26.09
Loss of smell	10	18.52	11	23.91
Weakness	14	25.93	18	39.13
Headache	10	18.52	14	30.43
Sore throat	14	25.93	3	6.52
Nausea	2	3.70	0	0.00
Diarrhea	3	5.56	5	10.87
Cough	9	16.67	13	28.26
Body ache	2	3.70	1	2.17

There was a significant difference observed in number of males and females reporting symptoms like Fever and sore throat. While more males experienced fever, females complained more of sore throat. The reasons for the same is a point which can be explored further and is outside the limits of this study.

#### 4. Limitations of the study

This study was done with an effective sample size of 100 subjects and to make certain conclusions studies with a more robust design, more number of participants and data is required. This study however represents a cross sectional view of the symptoms of Covid-19 prevailing in the society. Due to lower sample size significant differences in symptoms are not observed.

#### 5. Conclusion

There was no difference in the prevalence of symptoms observed from the first and second waves of Covid-19 pandemic in terms of fever, cough and weakness. There were a few newly reported symptoms that were observed namely sore throat and diarrhoea and a difference in men and women experiencing these symptoms was also observed. The limitations of this study however do not emphasize the differences in symptoms and more detailed studies with greater participants would be required to draw an effective conclusion.

#### 6. References

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