

# An observational study to determine the clinical course of asymptomatic and mildly symptomatic COVID-19–positive patients admitted to a tertiary care centre in Puducherry

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## Abstract

**Background:** Severe acute respiratory syndrome Coronavirus2 (SARSCoV2) disease (COVID-19) has spread nationwide including union territory of Puducherry.

**Methods:** Consecutive asymptomatic or mildly symptomatic COVID-19 patients admitted to the COVID-19 ward were included in the study. Demographic details, following of social norms, contact-exposure history, presence of co-morbidities, vital parameters, clinical symptoms and signs, development of new symptoms, progression and outcome of study patients are reported.

**Results:** Six hundred and forty two patients were included for final analysis. Most of symptomatic patients did not use face mask (87%) and did not follow social distancing (84.1%) or hand hygiene (91.3%). Out of mildly symptomatic patients, 12 become moderately or severely symptomatic and were shifted to intensive care unit. All these patients were male, aged more than 50 years with co-morbidities.

**Conclusions:** Wearing face mask, social distancing and hand hygiene can decrease disease severity. Male patients with co-morbidities and old age are at higher risk of progression to moderate or severe COVID-19 infection.

**Keywords:** Co-morbidity, COVID-19, face mask, hand sanitisers, male patients, social distancing

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## INTRODUCTION

The first severe acute respiratory syndrome Coronavirus2 (SARSCoV2) disease (COVID-19) case in union territory of Puducherry was recorded on 17<sup>th</sup> March 2020.<sup>[1]</sup> Various prophylactic measures such as use of face mask, frequent hand sanitisation and social distancing came into practice to prevent spread of virus.<sup>[2]</sup> Screening of symptomatic patients and their contacts was done, and patients infected

with coronavirus were isolated in COVID-19 care centres to prevent the spread of disease.<sup>[3]</sup> Most of the available studies highlight epidemiology and outcome in symptomatic and severely ill COVID-19–positive patients. Through this study, we aim to understand transmission dynamics and clinical outcomes of asymptomatic and mildly symptomatic COVID-19–positive patients.

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## MATERIAL AND METHODS

Institutional Research Committee and Ethics Committee permissions for conducting the study were obtained for conducting this prospective observational study. During the COVID-19 pandemic, there was excessive burden of COVID-19 positive patients on the government hospitals, due to which many private hospitals were converted into COVID-19 care centres. Our hospital was also one of them. Even though our hospital was a tertiary care hospital, all categories of COVID-19-positive patients were admitted.

Asymptomatic and mildly symptomatic nasopharyngeal swab real-time polymerase chain reaction (RT-PCR) positive COVID-19 patients admitted to our tertiary care centre at Puducherry, who gave consent to participate were studied. Patients who were moderately or severely symptomatic at the time of admission were excluded.

We studied clinical course of these patients. These patients were diagnosed to have COVID-19 based on the nasopharyngeal swab RT-PCR obtained at peripheral health institutions and were referred to our centre. Asymptomatic cases were those without any symptoms. Patients were mildly symptomatic if they reported symptoms such as cough, sore throat, headache, fever, loss of taste or smell and myalgia and had an arterial oxygen saturation measured by pulse oximetry (SpO<sub>2</sub>) more than 94% on room air.<sup>[4]</sup> Laboratory testing done at admission included complete blood count and chest radiograph. At presentation temperature, pulse, blood pressure and SpO<sub>2</sub> were recorded and monitored thrice-daily or in case of any fresh complaints by the patient. The patients were given symptomatic treatment during their stay. Patients were referred to intensive care unit (ICU) based on national guidelines.<sup>[5]</sup> Any episode of worsening of symptoms or referral of patient to ICU was recorded. The patients were discharged as per the guidelines set forth by the Ministry of Health and Family Welfare.<sup>[6]</sup> After discharge, the patients were telephonically communicated every week for three weeks about any recurrence of symptoms.

Demographic details, medical history, following of social norms (wearing mask, social distancing, use of hand hygiene techniques), contact and exposure history, presence of co-morbid diseases, vital parameters, existing clinical symptoms and signs, treatment for the symptoms, development of new symptoms, treatment given for the

same, progression and outcome were collected by the duty doctor posted in the COVID-19 ward. The information was filled in the pro forma provided. The consent form and proforma were scanned and accessed digitally for data collection.

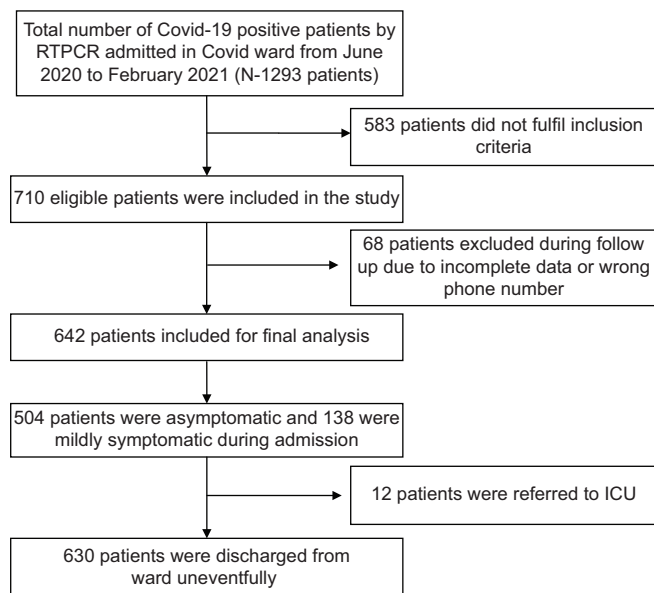
Apart from case records and case sheets, patients were telephonically communicated to obtain information about their clinical course and outcome and to collect information that was unavailable in the records.

## Statistical analysis

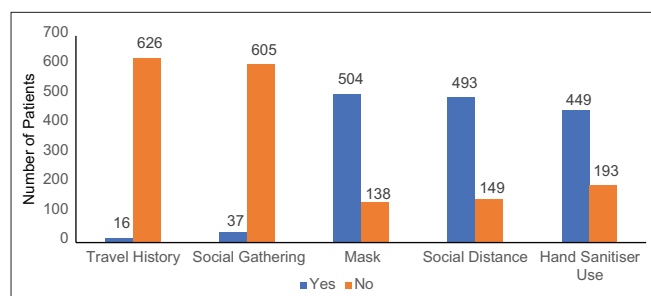
Data were recorded using a standardised proforma and were managed using Statistical Package for the Social Sciences (SPSS) version 17 statistical software. Categorical variables are expressed as percentages. Continuous variables are presented as median and interquartile range. Crude odds ratios (ORs) and 95% confidence intervals (CIs) associated with different exposures were calculated. Variables that were statistically significant with  $P < 0.05$  in univariate analysis were included in the final unconditional multiple logistic regression model.

## RESULTS

In the period between June 2020 and February 2021, a total of 1293 patients who were COVID-19 positive by RT-PCR and were asymptomatic or mildly symptomatic were admitted to the COVID-19 ward of our tertiary care centre. Out of these, 583 patients were excluded from the study as the patients did not give consent for participation/available data were incomplete. The remaining 710 patients were included in the study. Of these, 68 patients were excluded during follow-up due to wrong phone number and incomplete data. A total of 642 patient data were included for final analysis (Figure 1). Out of these, 428 patients were male (66.7%) (Table 1). Five hundred and twenty nine patients (82.4%) reported COVID-19 positivity among family members, and 170 patients (26.5%) were identified during contact tracing. Patients who wore face mask accounted for 502 patients (78.5%) of the study group. Social distancing was followed by 493 patients (76.8%) of the study population and 449 patients (69.9%) used measures such as frequent hand wash and hand sanitisers. Majority of the patients did not have history of travel (97.5%) or participation in any social function or event (94.2%) (Figure 2). Co-morbidities were present in 42 patients and the remaining 600 patients had no co-morbidities (93.5%). Diabetes mellitus was the most commonly present co-morbidity.



**Figure 1:** Clinical course of asymptomatic and mildly asymptomatic COVID-19–positive patients admitted in a tertiary care centre, Puducherry



**Figure 2:** Social norms followed by patients in the study

**Table 1: Demographic characteristics of COVID-19–positive patients**

| Patient characteristics                         | No. (%)    |
|---|------------|
| Age group (years)                               |            |
| 0-18  | 29 (4.5)   |
| 19-45   | 347 (54.0) |
| 46-60   | 172 (26.8) |
| Older than 60                                   | 94 (14.6)  |
| Gender  |            |
| Male  | 428 (66.7) |
| Female  | 214 (33.3) |
| Co-morbidities                                  |            |
| Diabetes  | 22 (3.4)   |
| Hypertension                                    | 6 (9)      |
| Diabetes + hypertension                         | 12 (1.9)   |
| Diabetes + hypertension+coronary artery disease | 1 (0.2)    |
| Bronchial asthma                                | 1 (0.2)    |
| No  | 600 (93.5) |
| Smoking   |            |
| Yes   | 124 (19.3) |
| No  | 518 (80.7) |
| Alcohol   |            |
| Yes   | 108 (16.8) |
| No  | 534 (83.2) |

Out of 642 patients, 504 patients were asymptomatic (78.5%), and 138 patients (21.5%) were mildly symptomatic at the time of admission. Of the asymptomatic patients, 482 patients became symptomatic during their stay in the hospital and 12 patients remained asymptomatic throughout their stay in hospital until they were discharged. The common presenting symptoms observed were fever (67.3%), sore throat (62%), generalised body ache (5.6%), cough (28.2%), headache (3.7%), anosmia (4.4%) and dysgeusia (3.6%) (Figure 3). The mean duration of stay in the COVID-19 ward was 7.135 days. None of the patients reported readmission to the hospital or development of new COVID-19–related symptoms over 21 days following discharge when communicated telephonically.

Most of the symptomatic patients did not use face mask (87%), did not follow social distancing (84.1%) and did not use hand sanitisers or did not follow frequent hand wash (91.3%). Out of the mildly symptomatic patients, 12 patients become moderately or severely symptomatic and had to be shifted to the ICU. These 12 patients (1.9%) complained of difficulty in breathing which was accompanied by fall in SpO<sub>2</sub> (Figure 4). All the patients who were shifted to the ICU were male patients who had one or more co-morbidities and were more than 50 years. No deaths were reported.

On univariate analysis, symptomatic patients at the time of admission were male gender [odds ratio (OR) = 1.884, 95% confidence intervals (CI) 0.595–2.313]; age over 50 years (OR 1.65, 95% CI 0.714–1.590) presence of co-morbidities (OR 3.713, 95% CI 1.962–7.029) and greater likelihood of having disease progression. Furthermore, disease progression was more likely to occur in patients who did not follow social norms such as wearing mask (OR 5.999, 95% CI 4.088–8.803), social distancing (OR 4.314, 95% CI 3.190–5.832) and hand hygiene (OR 2.665, 95% CI 2.209–3.216) (Table 2). On multivariate analysis, age above 50 years, male gender, presence of co-morbidities emerged as predictors for progression to moderate or severe illness (Table 3).

## DISCUSSION

We investigated the demographic details, social norms followed, clinical characteristics and clinical outcome of asymptomatic and mildly symptomatic patients COVID-19–positive patients admitted in the COVID-19 ward of a tertiary care centre in Puducherry. Most patients (78.3%) belonged to the age group between 18 and 60 (mean 42.4) years. The age

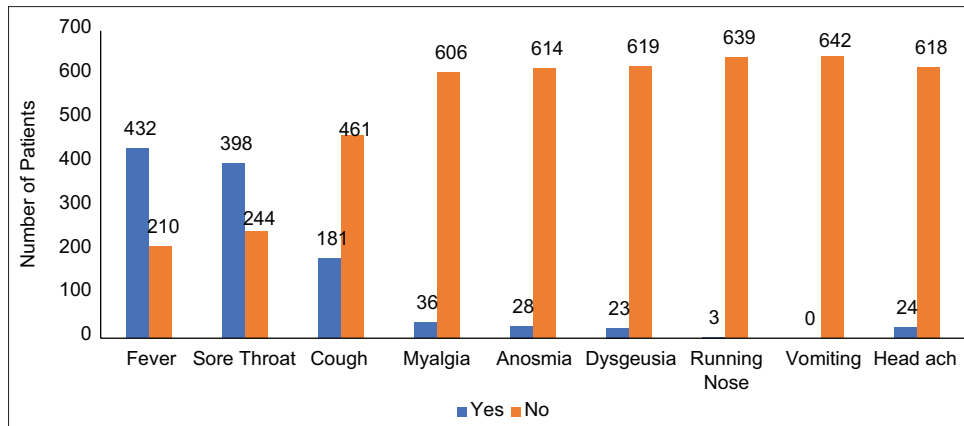


Figure 3: Symptoms reported by patients in the study

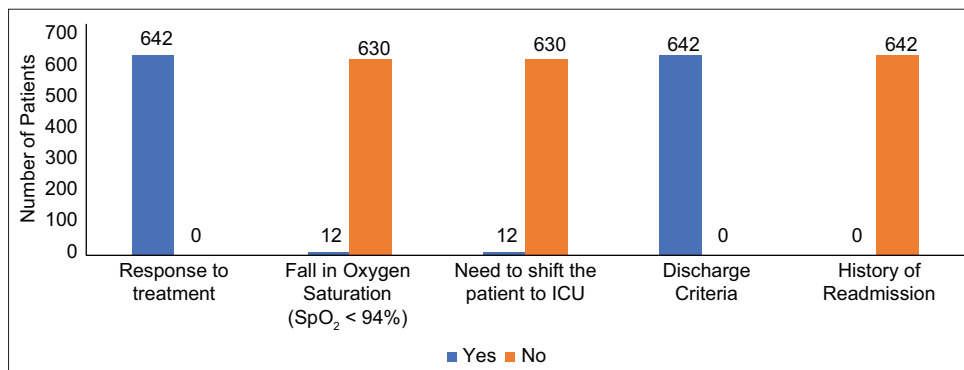


Figure 4: Disease outcome of patients in the study. SpO<sub>2</sub> = Arterial oxygen tension measured by pulse oximetry; ICU = intensive care unit

Table 2: Factors associated with disease progression in the study group

| Characteristic     | Patients with disease progression [No. (%)] | Patients without disease progression [No. (%)] | OR (95% CI)         |
|--------------------|---|--|---------------------|
| Age group          |   |  |                     |
| Older than 50      | 46 (22.2)                                   | 161 (77.8)                                     | 1.65 (0.714-1.90)   |
| Younger than 50    | 92 (21.1)                                   | 343 (78.9)                                     |                     |
| Gender             |   |  |                     |
| Male               | 89 (20.8)                                   | 339 (79.2)                                     | 1.884 (0.595-2.313) |
| Female             | 49 (22.9)                                   | 165 (77.1)                                     |                     |
| Co-morbidity       |   |  |                     |
| Yes                | 20 (47.6)                                   | 22 (52.4)                                      | 3.713 (1.962-7.029) |
| No                 | 118 (19.7)                                  | 482 (80.3)                                     |                     |
| Mask               |   |  |                     |
| Yes                | 22 (4.4)                                    | 482 (95.6)                                     | 0.009 (0.005-0.016) |
| No                 | 116 (84.1)                                  | 22 (15.9)                                      |                     |
| Social distance    |   |  |                     |
| Yes                | 22 (4.5)                                    | 471 (95.5)                                     | 0.013 (0.007-0.024) |
| No                 | 116 (77.6)                                  | 33 (22.1)                                      |                     |
| Hand sanitiser use |   |  |                     |
| Yes                | 15 (3.3)                                    | 434 (96.7)                                     | 0.020 (0.011-0.036) |
| No                 | 123 (63.7)                                  | 70 (36.3)                                      |                     |

OR=Odds ratio; CI=Confidence intervals

of the oldest patient was 90 years and the youngest patient was 6 years. In a research report of COVID-19 patients in Puducherry<sup>[7]</sup> reported mean age of the patients was 40 years; our observations were similar.<sup>[7]</sup> Majority of patients in our study were male (67.3%). It has been reported that there is a higher expression of coronavirus receptors in men as

compared to females<sup>[8]</sup> and this may perhaps be the reason for male preponderance in the study.

We studied the effectiveness of COVID-19-prevention strategies such as use of face mask, maintenance of social distancing and frequent hand sanitisation. We

**Table 3: Factors associated with disease progression from mildly symptomatic to moderate or severe COVID-19 disease**

| Characteristic | Patients with disease progression<br>[No. (%)] | Patients without disease progression<br>[No. (%)] | Risk estimate (with 95% CI) | P      |
|----------------|--|---|-----------------------------|--------|
| Age (years)    |  |   |                             |        |
| >50            | 12 (6.8)                                       | 195 (93.2)  | 0.932 (0.899-0.967)         | <0.001 |
| <50            | 0  | 435 (100)   |                             |        |
| Gender         |  |   |                             |        |
| Male           | 12 (3.3)                                       | 416 (96.7)  | 0.967 (0.951-0.984)         | 0.007  |
| Female         | 0  | 214 (100)   |                             |        |
| Co-morbidity   |  |   |                             |        |
| Yes            | 12 (33.3)                                      | 30 (66.7)   | 0.667 (0.538-0.826)         | <0.001 |
| No             | 0  | 600 (100)   |                             |        |

CI=Confidence intervals

found that most of the patients who wore mask were asymptomatic (75.4%) at admission. Studies have shown that cotton masks, surgical masks and N95 masks all have a protective effect with respect to the transmission of infective droplets/aerosols of COVID-19 virus and that the protective efficiency was higher when masks were worn by a virus spreader. However, medical masks (surgical masks and even N95 masks) may not be able to completely block the transmission of virus droplets/aerosols even when completely sealed.<sup>[9]</sup> In our study, most of the patients who followed social distancing were asymptomatic (73.5%) on admission. The effectiveness of social distancing more than 1 m in reducing the transmission of viral disease has been reported.<sup>[10]</sup> Hand hygiene was followed by 68.2% of the patients who were asymptomatic on admission in our study. Studies have concluded that hand hygiene is a key factor in reducing germs that can potentially cause disease.<sup>[11,12]</sup> Fever, sore throat, headache, cough and body ache were the most observed symptoms in our study. In a meta-analysis<sup>[13]</sup> these were also the most common symptoms observed and reported in other studies conducted in different countries. This is important as main symptoms of COVID-19 infection such as fever, cough, fatigue and dyspnoea can have a key role in early detection of this disease.<sup>[14]</sup>

In our study, 42 patients had co-morbidities. All the patients who become moderate-to-severely symptomatic had one or more co-morbidities. Various studies have shown that patients with co-morbidities have more deteriorating outcomes compared with patients without co-morbidities.<sup>[15,16]</sup> Hypertension, obesity and diabetes mellitus were identified to be the most prevalent co-morbidities in COVID-19 patients.<sup>[17]</sup> A meta-analysis<sup>[18]</sup> has shown that cancer, chronic kidney diseases, diabetes mellitus and hypertension were independently associated with mortality in COVID-19 patients.<sup>[1]</sup> However, in our study, there were no deaths.

All the patients with progression to moderate or severe symptoms in our study were more than 50 years and belonged to male gender. In a meta-analysis,<sup>[19]</sup> age was observed to significantly determined the clinical features and prognosis of COVID-19. The prognosis was worse in patients older than 50 years, calling for clinicians to pay more attention to patients of this age. Male patients with COVID-19 were associated with significantly increased risk of mortality compared to females.<sup>[19]</sup> In our study, all the patients were monitored at an 8<sup>th</sup> hourly interval daily and whenever the patient complained of new signs and symptoms. Hence, we were able to identify patients who required ICU care and patients were shifted accordingly. Recurrence of COVID-19 symptoms has been reported.<sup>[20]</sup> In our study, recurrence of COVID-19-related symptoms was enquired telephonically weekly once after discharge till 21 days. None of the patients reported any recurrence of symptoms.

The present study had some limitations. We were unable to get data regarding some patients as communication was not possible because of wrong phone number. However, we excluded these patients during the final analysis. Patients could have falsified or concealed information related to use of COVID-19-preventive measures such as wearing mask, social distancing and hand hygiene. We created no pressure on the patients and encouraged them to answer honestly and to the best of their knowledge. Collection of data from other centres in Puducherry would have made the results more robust. This could not be done due to logistic reasons.

Through our study, we can emphasise the importance of following preventive measures such as wearing of face mask, social distancing and hand hygiene in decreasing disease severity. Preventive measures like such as wearing of face mask, social distancing and hand hygiene decrease disease severity of COVID-19. Fever, sore throat, headache, cough and body ache are the most frequently

observed symptoms and important for identification of COVID-19 infection. Male patients who are more than 50 years with co-morbid conditions are at higher risk of progression to moderate or severe COVID-19 infection. These results of our study can help in developing protocols for monitoring asymptomatic and mildly symptomatic COVID-19-positive patients admitted in the COVID-19 wards.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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