

Original Article

The prevalence of asymptomatic COVID-19 cases in a single center and duration of viral clearance.

Arifa Akram¹, Md. Tanjimul Islam², Md. Ashiqur Rahman³, Md. Raihanul Islam³, Md. Mahbub Ali³,
Toufiqul Islam³, Lubana Akram⁴, Md. Alimur Reza³

¹Department of Virology, National Institute of Laboratory Medicine and Referral Center, Dhaka, Bangladesh

²Beximco pharmaceuticals Ltd, Dhaka, Bangladesh, ³Novus Molecular Lab, Paribag, Dhaka, Bangladesh

⁴Department of Paediatric Gastroenterology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.

Abstract

Background: The COVID-19 pandemic is already a public health emergency and led to millions of cases and deaths worldwide since its outbreak on December 2019. Public health responses is not seen to identify asymptomatic individuals who are also infectious. Data are also limited on the duration of viral clearance.

Methods: Retrospectively and randomly selected 2117 cases who came to do PCR for COVID-19 in Novus molecular Lab, Dhaka between 5 March 2021 and 5 May 2021. Laboratory data and patient's characteristics, such as age, sex, and other relevant history were collected from our laboratory database.

Results: Among 2117 cases (symptomatic or asymptomatic patients), SARS-CoV-2 RNA was detected in 501 samples (24%). Among 501 positive cases 352 were male and 149 were female with the mean age of 34.81 (SD±12). The most common complaints were fatigue (68%), high temperature (57%); but anosmia and ageusia were present among 57% cases in symptomatic and also asymptomatic groups. Among the positive cases, 30-39 years of age group was mostly affected followed by 19-29 years. 48% asymptomatic cases were found among the positive cases. The mean CT value was significantly higher in asymptomatic (24.5 ± 0.4), compared to symptomatic (23.37 ± 0.3). The median duration of viral conversion in this study was 20 days (IQR 16–33 days).

Conclusion: We found those people having symptoms have delayed viral clearance. These data disclose the high asymptomatic incidence of SARS-CoV-2 infection in Bangladesh, and that these cases may act as carrier. Public health expert should think for routine screening in office or other area to identify asymptomatic cases and to contain the outbreak.

Introduction

The novel coronavirus (2019- nCoV) from Wuhan is currently becoming a threat to the civilization as the virus is spreading around the world. Since identification of the virus in late December 2019, the number of cases from China that have been imported into other countries¹ have raised and this pandemic has affected international social and economic activities markedly.

SARS-CoV-2, the virus causing Coronavirus disease 2019 (COVID-19), has infected 244,427,544 people and lead to the death of 4,963,752 people worldwide since its outbreak in December 2019 up to 24 October, 2021². The disease has a wide range of presentations, from asymptomatic infection to fever, cough, shortness of breath and the loss of taste and smell. Usually symptoms appear 2-14 days after exposure to the virus and may develop into mild upper respiratory tract infections or sometimes progress to severe pneumonia or respiratory distress, shock, multi organ failure and death. The virus is thought to mainly be transmitted through person-to-person contact, with evidence that SARS-CoV-2 transmits through the inhalation of large droplets exhaled by infected individuals³.

Correspondence:

Dr Arifa Akram

Assistant Professor, Department of Virology
National Institute of Laboratory Medicine and Referral center
Dhaka, Bangladesh

Mobile: +8801816-296249, Email: drbarna43@gmail.com

ORCID id: 0000-0001-8829-9817

On 1 February 2020, the World Health Organization (WHO) indicated that "transmission from asymptomatic cases is likely not a major driver of transmission". One meta-analysis found that 17% of infections are asymptomatic, and asymptomatic individuals were 42% less likely to transmit the virus⁴.

Bangladesh is among the top 20 countries in terms of confirmed cases of COVID-19, with a positive case rate of 19.09%-22.91% as of June 1, 2020⁵. Social distancing is difficult in many areas of the country.

40% to 45% of SARS-CoV-2 infections account for asymptomatic persons. They can transmit the virus to others, sometimes for more than 14 days. Subclinical lung abnormalities, as detected by computed tomography is not uncommon in case of asymptomatic infection. As asymptomatic persons spread the virus silently, it is quite impossible to find them out without routine testing⁶.

35% of COVID-19 cases are asymptomatic declared by the Center for Disease Control and Prevention, and that 40% of transmission occurs before appearance of symptom. When a healthcare worker became positive for SARS-CoV-2, contact screening identified that 56% people were positive for SARS-CoV-2, but they were asymptomatic. It is clear that these asymptomatic cases are acting as a reservoir and are responsible for community spread of the virus⁷.

This study aimed to see the prevalence of asymptomatic cases in a single center of Bangladesh and also to identify the duration of viral clearance.

Methods

Novus molecular lab, Dhaka, Bangladesh regularly tested COVID 19 for the symptomatic and asymptomatic persons. We retrospectively reviewed documents and medical records of 2117 cases who were tested here between 5 March 2021 and 5 May 2021. The samples were collected from symptomatic patients (fever, cough, chills and dyspnea) or from asymptomatic patients who had contact with infected patients or need to travel to foreign country. Laboratory data and patient's characteristics, such as age, sex, and other relevant history were collected from our laboratory database.

A confirmed COVID-19 case was defined as an individual who tested positive for SARS-CoV-2 Envelope (E) and

RNA-dependent RNA polymerase (RdRP). The test was conducted by taking a nasopharyngeal (NP) and oropharyngeal swab (OP). Both samples were tested for the presence of SARS-CoV-2 by polymerase chain reaction (PCR) analysis. The RT-qPCR test was conducted using SD biosensor Master Mix on the Applied Bio systems (Foster City, CA) 7500 Fast Dx RealTime PCR Instrument.

Statistical Analysis

Statistical analysis was performed using the SPSS statistical software (version 25; IBM). Qualitative variables are expressed as percentages and quantitative variables as means, standard deviation (SD), and range. A P-value of <0.05 was considered statistically significant.

Result

A total of 2117 cases (symptomatic or asymptomatic patients) were analyzed. SARS-CoV-2 RNA was detected in 501 samples (24%). Among 501 positive cases 352 were male and 149 were female (Figure 1) with the mean age of 34.81 (SD±12) (Figure 2). The most common complaints were fatigue (68%), high temperature (57%), myalgia (49%), headache (44 %), dry cough (40%), dyspnea (33%), diarrhea (17%), and nausea or vomiting (12%). Interestingly, anosmia and ageusia was present among 57% cases in symptomatic and also asymptomatic groups.

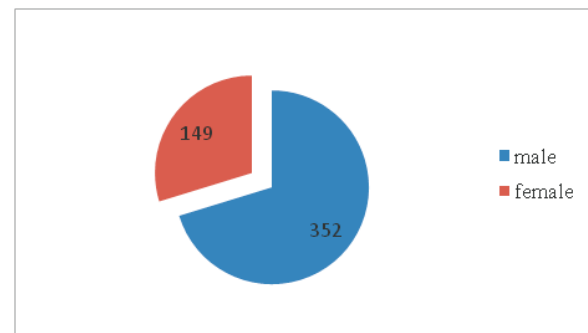


Figure 1: Male female ratio among positive cases

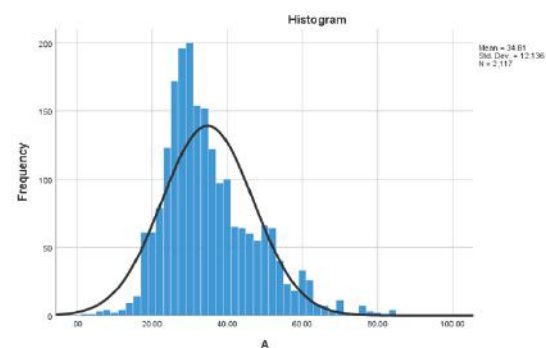


Figure 2: Age distribution shows mean age of 34.81 (SD ±12.13)

To visualize the overall infected cases and transmission levels and to compare, we divided age group such 0–18, 19–29, 30–39, 40–49, 50–59 and more than 60 years. Among the positive cases 30-39 years of age group was mostly affected followed by 19-29 years (Figure 3).

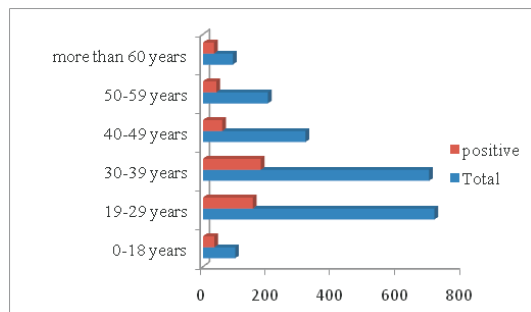


Figure 3: Total positive cases was plotted with age group and 30 to 39 years of age group were mostly affected

Analysis of the number of symptomatic and asymptomatic cases of each gender was undertaken. We found 241 (48%) asymptomatic cases among the 501 positive cases (Figure 4). They were asymptomatic or in contact with symptomatic cases as or did it routine purpose for their office or travelling or other reason. Among the asymptomatic cases, most were male.

There was a history of 100 cases in contact with positive patients among which 35 cases became positive later.

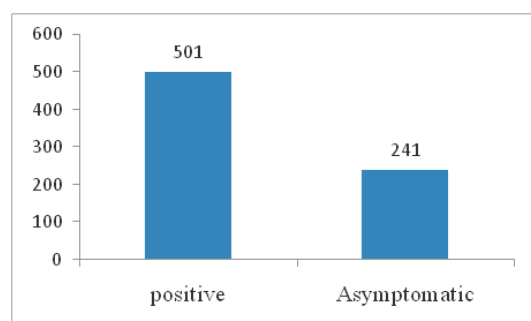


Figure 4: Total number of asymptomatic cases among the positive cases

CT values were available for 501 individuals; 260 cases were symptomatic cases and 241 were asymptomatic, with CT values ranging between 17-33 and 16-30, respectively. The mean CT value was significantly higher in asymptomatic (24.5 ± 0.4), compared to symptomatic (23.37 ± 0.3)

The median duration of viral conversion in this study was 20 days (IQR 16-33 days). The shortest duration was 11

days and the longest was 45 days. The patient with the shortest duration of RNA viral clearance was a 23-year-old male with no comorbidities. Regarding the longest duration of 45 days, the patient concerned was a 62-year-old male with diabetes. 136 patients (27 %) had consecutive negative RT-PCR within 14 days, 299 patients (59 %) within 21 days, and 66 patients (13 %) more than 21 days.

Discussion

Following emergence of COVID-19 in Wuhan, China, in December 2019, thousands of people have died from SARS-CoV-2. For the time being hundreds of imported and resulting secondary cases have been reported in multiple countries as of 31 August 2021⁸.

Most of the COVID-19 studies usually describes initial clinical and laboratory findings. So far, there has been little investigation of the duration of SARS CoV-2 RNA shedding in Bangladesh.

In our study, among 2117 cases, 501 was positive and 1616 was negative. Among the positive cases, 78% were male and mean age was 34.81 (SD±12) and most affected age group was 19-29 years. Interesting thing was 48% cases were asymptomatic. These data show that in a large cohort of at-risk subjects for COVID-19, the majority of those who were or subsequently became positive were asymptomatic and remained asymptomatic until viral clearance. Anosmia and ageusia were present among 57% cases in symptomatic and also asymptomatic groups.

As of early April 2020, evidence suggests that as many as 50% of all SARS-CoV-2 infections are asymptomatic⁹. Asymptomatic infection was sometimes associated with lung findings by computed tomography and these persons may act as a silent carrier¹⁰.

The proportion of asymptomatic COVID-19 patients in our study was 48% which is greater than those estimated by other studies, where they range from 17.9% to 35% and not dissimilar to that reported in the cruise ship outbreak¹¹⁻¹³.

The median time to viral conversion observed in the study cohort was 20 days (IQR 16-33 days) from the first positive RT-PCR test, almost similar to the results of the study by Bennasrallah et al., 2021¹⁴. Other published studies have revealed a shorter median duration of viral

clearance of 9.5 days as well as a longer median duration of viral clearance of 31 days^{15,16}. Though a previous study showed prolonged SARS-CoV-2 RNA clearance experienced by male sex, but we did not correlate such findings¹⁷.

This study had a number of limitations. This study reports only qualitative results for nucleic acid detection, but SARS-CoV-2 RNA positivity for prolonged time and persistent shedding of live virus is not same. Till now, it is not known that the shedding of viral RNA correlates with the shedding of infectious virus or not which needs further studies.

Conclusion

In conclusion, our data show high asymptomatic incidence of SARS-CoV-2 infection in Bangladesh and these people remained asymptomatic until viral clearance. It is showing the high risk of transmission from a silent carrier and the need for screening as routine test to help halt the ongoing pandemic.

Conflicts of interest

The authors have declared that no conflicts of interest exist.

Ethical approval

The study was approved by the Ethical Committee of NILMRC.

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