http://www.banglajol.info/index.php/JNINB

Original Article DOI: https://doi.org/10.3329/jninb.v7i2.58101

Journal of National Institute of Neurosciences Bangladesh, ISSN (Online) 2518-6612
July 2021, Vol. 7, No. 2, pp. 132-136 ISSN (Print) 2410-8030

Association of Demographic Profiles with RT-PCR Test Results for Covid-19 Patients during First Wave of Pandemic: A Retrospective Cross-Sectional Study from Dedicated Laboratory of Manikgonj District of Bangladesh

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[**Received on:** 22 April 2021; **Accepted on:** 12 May 2021; **Published:** 1 July 2021]

Abstract

Background: RT-PCT test for Covid-19 is the most widely used test during the pandemic. **Objectives:** The purpose of the present study was to see the status of RT-PCR test for Covid-19 during first wave of pandemic in Bangladesh at a dedicated hospital outside Dhaka city. **Methodology:** This retrospective cross-sectional study was conducted in the Department of Microbiology at Colonel Malek Medical College, Manikgonj, Bangladesh from November 2020 to April 2021 for a period of six months. The suspected cases of covid-19 patients or patients who had the history of contact with the confirmed cases of Covid-19 patients were advised by the clinician to do the test. RT-PCR for Covid-19 test was performed and results were recorded with their age and gender. **Results:** A total number of 6678 cases were recruited for this study. The mean age with SD of positive and negative were 42.6±17.32 years and 40.98±18.78 years respectively (p=0.023). The male and female ratio was 1.8:1 (p=0.004). Out of 668 positive cases of Covid-19 patients most of them were from urban area which was 464(9.1%) cases during this pandemic (p=0.000). Out of 675 cases of having history of travel, Covid-19 was positive in 43(6.4%) cases. Again, 6003 patients were without travel history and among these 625(10.4%) cases were Covid-19 RT-PCR positive (p=0.001). **Conclusion:** In conclusion young adult male patients are most commonly suffering with Covid-19 infection. *[Journal of National Institute of Neurosciences Bangladesh, July 2021;7(2):132-136]*

Keywords: RT-PCR test; COVID-19; first wave

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Conflict of interest: There is no conflict of interest relevant to this paper to disclose.

Funding agency: This research project was not funded by any group or any institution.

Contribution to authors: Ahmed I, Akhtaruzzaman M were involved in protocol preparation, data collection and literature search and manuscript writing. Ahmed I, Samad K, Quadir R, Rabin N were involved in preparation and revision of this manuscript.

How to cite this article: Ahmed I, Akhtaruzzaman M, Samad K, Quadir R, Rabin N. Association of Demographic Profiles with RT-PCR Test Results for Covid-19 Patients during First Wave of Pandemic: A Retrospective Cross-Sectional Study from Dedicated Laboratory of Manikgonj District of Bangladesh. J Natl Inst Neurosci Bangladesh, 2021;7(2): 132-136

Introduction

The novel severe acute respiratory syndrome coronavirus- 2 (SARS-CoV-2) has rapidly spread across Bangladesh from April 2020 and there is an unprecedented propagation due to its infectious nature[1]. The World Health Organization declared the COVID-19 outbreak as a pandemic on 11th March 2020 worldwide[2]. With a rising number of cases, the need to screen all patients with respiratory symptoms and travel history has been recognized. One effective strategy is to establish of fever clinics or COVID-19 screening centres. These screening centres are assigned to screen patients based on a standard criterion. With increasing instances of nosocomial outbreaks of COVID-19, it has become even more important to screen all patients with suspected infectious disease in the hospital setting as well as for control and prevention of infection in the community[3]. During pandemic alert in Bangladesh suspected patient screening in health facilities has been was strongly recommended by the Ministry of Health and Family

Welfare (MOHFW), Bangladesh[4]. A guidelines has been issued for setting up COVID-19 screening centres in healthcare settings. These screening centres are established for those patients who are presented with influenza-like illness in a separate area from the general outpatient department, to facilitate implementing standard droplet precautions, to triage the patients and collect samples[5]. Based on these principles, healthcare institutions have developed and implemented a hospital-specific systematic process for screening and managing suspected COVID-19 patients[6]. However, till now there is limited published literature regarding the functioning and patient profile of these COVID-19 screening facilities, especially at tertiary care institutions which are significantly involved in both COVID-19 and non-COVID-19 services simultaneously[7]. Hence, this study was undertaken to understand the patient profiles and evaluation of COVID-19 screening centres at a tertiary health care institution outside Dhaka city.

Methodology

This retrospective cross-sectional study was conducted in the Department of Microbiology at Colonel Abdul Malek Medical College, Manikgonj, Bangladesh from November 2020 to April 2021 for a period of six months. The suspected COVID-19 patients who were referred to the laboratory for screening from the OPD of Department of Medicine and other Departments of Colonel Abdul Malek Medical College, Manikgonj, Bangladesh as well as from the different health centres. The main purpose of the referral of the suspected patients to the laboratory was to segregate COVID-19 and Non-COVID-19 patients through screening before their admission into the hospital or home. Patients were categorized into "Suspect" and "Not-a-suspect" case for COVID-19 based on travel history in the last 14 days, contact history in the last 14 days and relevant symptoms suggestive of COVID-19 like fever, sore throat, cough, dyspnoea and loss of taste/smell. The suspected cases were referred to the sample collection zone and the nasopharyngeal swab samples were collected by the trained laboratory personnel. All the samples were sent to the IEDCR-approved Diagnostic Laboratory of the Department of Microbiology under a proper cold-chain system. All the samples were tested by the reverse transcriptase-polymerase chain reaction (RT-PCR) method. Any patient with incomplete or missing data or duplicity were being excluded from the study. At the time of patient examination, the staffs input the data, such as the presence of COVID-19 symptoms, travel history, and a history of contact with COVID-19 patients, after interviewing the patient. All the extracted quantitative data were administered in Microsoft Excel 2016 along with the relevant variables mentioned. Data analysis was performed by SPSS version 23.0. The analysis of sociodemographic variables and variables related to COVID-19 screening services was expressed using descriptive statistics like mean, median, proportion and relevant graphical presentation. Personal identifiers for the patients were removed from the dataset after data extraction to maintain privacy and confidentiality.

Results

A total number of 6678 cases were recruited for this study. Majority positive patients were in the age group of 20 to 40 years which was 270(9.9%) cases followed by 40 to 60 years of age group and 60 to 80 years age group which were 231(11.2%) cases and 95(9.8%) cases respectively. The mean age with SD of positive and negative were 42.6±17.32 years and 40.98±18.78 years respectively (p=0.023) (Table 1).

Table 1: Rate of Positivity among Different Age Group (n=6678)

Age Group	Covid-19 Results		Total	P value
	Positive	Negative		
Less Than 20 Years	61(7.5%)	755(92.5%)	816(100.0%)	
20 to 40 Years	270(9.9%)	2469(90.1%)	2739(100.0%)	
40 to 60 Years	231(11.2%)	1826 (88.8%)	2057 (100.0%)	0.004*
60 to 80 Years	95(9.8%)	879 (90.2%)	974 (100.0%)	
More Than 80 Years	11(12.0%)	81(88.0%)	85(100.0%)	
Total	**668(10.0%)**	**6010(90.0%)**	**6678 (100.0%)**	
Mean±SD	42.6±17.32	40.98±18.778	41.15±18.64	0.023**

*Chi-square test was performed to see the level of significance; Student t test was performed to see the level of significance.

In this study positive was found more in male than female which was 461(10.8%) cases and 207(8.6%) cases respectively. The male and female ratio was 1.8:1. The gender with the rate of positivity of Covid-19 cases between male and female were statistically significant (p=0.004) (Table 2).

Majority of the suspected cases of Covid-19 cases were dwellers of urban area. However, out of 668 positive cases of Covid-19 patients most of them were from urban area which was 464(9.1%) cases and the rest of 204(13.1%) cases were from rural area during this

pandemic. The relationship between the urban and rural positivity of Covid-19 cases were statistically significant (p=0.000) (Table 3).

Table 2: Gender Distribution among Study Population (n=6678)

Gender	Covid-19 Results		Total	P value
	Positive	Negative		
Male	461(10.8%)	3808 (89.2%)	4269 (100.0%)	
Female	207(8.6%)	2202 (91.4%)	2409 (100.0%)	0.004
Total	**668(10.0%)**	**6010(90.0%)**	**6678 (100.0%)**	

Male:Female=1.8:1; Chi-square test was performed to see the level of significance.

Table 3: Relationship of Residence with the Covid-19 Positivity among Study Population (n=6678)

Residence	Covid-19 Results		Total	P value
	Positive	Negative		
Urban	464(9.1%)	4653 (90.9%)	5117 (100.0%)	
Rural	204(13.1%)	1357 (86.9%)	1561 (100.0%)	0.000
Total	**668(10.0%)**	**6010(90.0%)**	**6678 (100.0%)**	

Chi-square test was performed to see the level of significance.

Travel history was important factor for positivity among the Covid-19 patients. However, out of 675 cases of having history of travel Covid-19 was positive in 43(6.4%) cases. Again, 6003 patients were without travel history and among these 625(10.4%) cases were Covid-19 RT-PCR positive. The association between the travel history with the positivity of Covid-19 cases were statistically significant different (p=0.001) (Table 4).

Table 4: Association of History of Travel with the Covid-19 Results (n=6678)

H/O	Covid-19 Results		Total	P value
Travel	Positive	Negative		
No	625(10.4%)	5378 (89.6%)	6003 (100.0%)	
Yes	43(6.4%)	632 (93.6%)	675 (100.0%)	0.001
Total	**668(10.0%)**	**6010(90.0%)**	**6678 (100.0%)**	

Chi-square test was performed to see the level of significance.

Discussion

The role of screening OPD for COVID -19 is essential to maintain hospital function through preventing nosocomial infection and is to provide diagnostic services among suspected COVID-19 patients from the community in an accurate and timely manner[8-9]. This laboratory is the only dedicated facilities in Manikgonj which is near to Dhaka city of Bangladesh. The communication is very well facilitate. Therefore the chance of spread of infection is most common in this district. In addition many people living in this district are foreign workers which make more vulnerable considering the spread of infection.

The present experience with COVID-19 has reinforced the role of separate OPD under various names like "fever clinic", "screening OPD", "screening clinic" which can prevent the spread of nosocomial infection[10-12]. In a resource-constrained setting like Bangladesh, these facilities have played a significant role in both screening and triage during the pandemic[13]. Mahesh et al[14] have conducted a similar study in a tertiary care hospital in western India. They concluded that early diagnosis, quick initiation of treatment, infection control measures and reasonable care at the hospital effectively reduced the morbidity and mortality during the pandemic. With the limited resources this laboratory is working with its full pace to diagnose the Covid-19 cases. Currently as this laboratory is only one in this district the pressure of doing tests is also enormous.

A total number of 6678 cases were recruited for this study. Majority positive patients were in the age group of 20 to 40 years which was 270(9.9%) cases followed by 40 to 60 years of age group and 60 to 80 years age group which were 231(11.2%) cases and 95(9.8%) cases respectively. The mean age with SD of positive and negative were 42.6±17.32 years and 40.98±18.78 years respectively (p=0.023). This results reflect the more movements of this young adults group during pandemic lead to become Cvoid-19 positive. In this regards a study conducted by Kwon et al and have reported that COVID-19 screening clinics are effective in maintaining the non-COVID-19 treatment facilities by reducing the incidence of nosocomial infection in the hospital. In addition Covid-19 dedicated laboratory might have played a crucial role in the prevention of possible nosocomial infection by early diagnosis and thus segregation of COVID-19 positive patients as well as healthcare workers at Manikgonj district of Bangladesh. Although this laboratory has been planned and designed according to the existing health facility infrastructure and local environment, some of the improvements based on evidence from other studies can be incorporated into its functioning. Modifications like a separate passage for patient–staff waste and sample collection in a negative pressure chamber can further strengthen the infection prevention and control measures which is also applied in the laboratory[10,15].

In this study positive was found more in male than female which was 461(10.8%) cases and 207(8.6%)

cases respectively. The male and female ratio was 1.8:1. The gender with the rate of positivity of Covid-19 cases between male and female were statistically significant (p=0.004). From this results it is clear that the male gender is suffering from Covid-19 more than female. Similar results are also reported by another study and have mentioned that as far as the patient profile is concerned, the maximum proportion of patient belongs to the male gender. In another study Khan et al have found similar results and this may be due to the lesser tendency among the female and elderly population to seek proactive COVID-19 related care because of social and inadequate health-seeking behaviour issues[11,16]. However, there is no definitive cause regarding this predominance.

Majority of the suspected cases of Covid-19 cases were dwellers of urban area. However, out of 668 positive cases of Covid-19 patients most of them were from urban area which was 464(9.1%) cases and the rest of 204(13.1%) cases were from rural area during this pandemic. The relationship between the urban and rural positivity of Covid-19 cases were statistically significant (p=0.000). This indicates that the urban dwellers are more closely living in comparison with rural dwellers. This leads to less infection rate among the rural people. Again, the urban people are wandering as asymptomatic population visiting highly congested OPD for follow up visits and these patient attendants, healthcare workers and individuals with travel history make this urban area as hotspot areas at that point of time[17].

Travel history was important factor for positivity among the Covid-19 patients. However, out of 675 cases of having history of travel Covid-19 was positive in 43(6.4%) cases. Again, 6003 patients were without travel history and among these 625(10.4%) cases were Covid-19 RT-PCR positive. The association between the travel history with the positivity of Covid-19 cases were statistically significant different (p=0.001). It is an important issue of history of travelling among the covid-19 positive patients. It is well said that virus can't move from one place to another but the people move the virus. Therefore, people with lack of knowledge and ignorance leads to increase more chance to infect. Similar results have been reported by another author[15] and have added that on further analysis of the profiles of patients with respect to time, the number of patients visiting OPD with travel history and contact history. This may be due to the initiation of unlock after a nationwide lockdown[18].

Evolution in pandemic response strategies like rapid antigen test, improvement in health care infrastructure and emergency transportation services can facilitate the functioning of CS-OPDs at the primary care institutions if planned adequately[14,16]. This present study gives an overview of the functioning of a COVID-19 screening test.

Conclusion

In conclusion young adult age group are most commonly suffering from Covid-19 among the study population. Furthermore male patients are most commonly suffering with Covid-19 infection than female which is statistically significant. However, the urban dwellers are reported significantly more RT-PCR positive to SARS CoV2 than the rural people. The travel history is important by getting this present study results which shows that Covid-19 is significantly positive those people who have the history of travelling. This COVID-19 screening in the laboratory has been effective in providing screening as well as for diagnostic services to patients. Inclusion of point-of-care testing services and broadening the ambit of suspected criteria at screening OPDs can help us to detect more COVID-19 positive cases. As the pandemic continues, it is evident that no single strategy is sufficiently effective. Therefore, the health system must adhere to a holistic approach in dealing with this pandemic for which COVID-19 screening OPDs remains a critical component as well as the laboratory diagnosis.

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