First week of testing nCovid-19 at a tertiary care hospital of Jaipur (Rajasthan) India

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Abstract—Coronavirus (nCovid-19) is an emerging disease causing current pandemic. This pandemic has entered in 187 countries including India. There is emphasis on identification of these cases. So this study was conducted in a Private Medical College of Jaipur to know the status of testing of nCovid-19 cases in its initial stages. It was found that 2065 samples were received 13th.April 2020 to 15th April 2020, results were received from 15th April 2020 to 19th April 2020 with positivity of 3.26% and mean time lag was found 2.9 days with standard deviation of one day. Out of 68 positive cases found in these days majority were in 45-60 years with M:F 1.96. All the positive cases were from Jaipur, out of that 73.5% from Ramganj area. As positivity is quite high and majority of positive cases were from Ramganj area so containment measures should be directed mainly towards this area and as the numbers of samples were of just few days so more studies are suggested with appropriate sampling.

Keywords: Coronavirus, nCovid-19, Positivity Rate, Time lag in testing.

I. INTRODUCTION

The whole world is in pandemic of nCovid-19 which was 1st identified in Wuhan city of Hubei Province, China experiences a cluster of typical pneumonia cases. Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) was isolated from the throat and nasal swab cultures.[1,2] It's clinical manifestations included fever, dyspnea, fatigue, dry cough, myalgia, lymphopenia and radiographic findings of pneumonia. For severe and critical cases, patients suffered from acute respiratory distress syndrome (ARDS), acute respiratory failure, other serious complications and even death.[3,4] Recent reports suggested that asymptomatic COVID-19 infected individuals could also be the source of transmission.[5,6]

To successfully contained the epidemic of SARS-CoV-2, public health interventions such as disease detection and isolation were critical. Thus, rapid and accurate detection of the causative pathogen is essential in controlling the outbreak among both asymptomatic carriers and individuals showing signs of the disease.[7] However, since SARS-CoV-2 is a newly discovered virus, the diagnostic toolkit is limited. Current diagnostic tests for coronavirus include reverse-transcription polymerase chain reaction (RT-PCR), realtime RT-PCR (rRT-PCR), and reverse transcription loop-mediated isothermal amplification (RT-LAMP).[8,9]

Two kinds of diagnostic tests are being currently used in India -- RT-PCR test and rapid antibodies test for nCovid-19, as per the global health norms.[10] Results of rapid antibodies test are not reliable so 21 April 2020, the Indian council of Medical Research (ICMR) has advised Indian states to stop using the

rapid antibody tests as Rajasthan health minister Mr. Raghu Sharma said that it gave only 5.4 percent accurate results.[11]

In acute respiratory infection, RT-PCR is routinely used to detect causative viruses from respiratory secretions. Nasopharyngeal and oropharyngeal swabs are the recommended upper respiratory tract specimen types for SARS-CoV-2 detection.[12]

On 8 April 2020, In India, the Supreme Court of India ruled that private labs should be reimbursed at the appropriate time for COVID-19 tests.[13] So state government start giving permission to test for nCovis-19 using RT-CR machines. Mahatma Gandhi Medical College is one of the apex medical college among private colleges of Rajasthan. It has given permission on 12 April 2020 to test for nCovis-19 using RT-CR machines.

Mahatma Gandhi Medical College had started testing for nCovid-19 since 13.04.2020, so this present study was conducted to know the status of testing nCovid-19 disease and to present the status of positive cases.

II.   METHODOLOGY

This laboratory based descriptive type of observational study was conducted in Mahatma Gandhi Medical College, Jaipur (Rajasthan) India in April 2020.

Mahatma Gandhi Medical College, Jaipur had two RT-PCR but there was no permission from the state government to do test for nCovid-19 before 13th April 2020. College received permission from the state government on 13th April 2020 to do test for nCovid-19. Thus MGMC start doing test for nCovid-19 since 13th April 2020. (Table 1)

On 14th April 2020, 2 Nuclic Acid Extractors were also installed to give speed to the tests. (Table 1)

TABLE 1

DATE WISE STATUS OF RT-PCR AND NUCLIC ACID EXTRACTOR

Date	RT-PCR	Nuclic Acid Extractor	Permission
Before 13.4.2020	2	0	No
13.04.2020	2	0	Yes
14.04.2020	2	2	Yes
14.04.2020	2	2	Yes
15.04.2020	2	2	Yes

Data regarding sample received, sample tested and results of the tested samples were collected. Data thus collected were compiled in the form of master chart in Microsoft Excel 2010. Postivity rate and time lag in sample received and result declared were calculated.

III.   RESULTS

Mahatma Gandhi Medical College, Jaipur started doing test for nCovid-19 since 13th April 2020 after getting permission from the state government. First day 558 samples were processed and results were

obtained on 15th April 2020 with 6.45% positivity rate & 2 days time lag in samples received and results obtained. On second day i.e. on 14th April 2020, as two Nuclic Acid Extractors were also installed 744 samples were processed. Out of these 744 samples, results of 509 sampled were received on date 17th April 2020 with 0.25 positivity rate & 3 days time lag in samples received and results obtained. And results of other 235 were obtained on 18th April 2020 with 0.43% positivity rate & 4 days time lag in samples received and results obtained. On third day i.e. on 15th April 2020 762 samples were processed and results were obtained on 19th April 2020 with 3.94 positivity rate & 4 days time lag in samples received and results obtained. Overall positivity rate was found 3.26% and mean time lag was found 2.9 days with standard deviation of one day. (Table 2 & Figure 1)

TABLE 2

DATE WISE STATUS OF nCOVID-19 TEST DONE

Date	Sample Tested	Date of Result	Results			Positivity Rate
			Positive	Negative	Total	
13.04.2020	558	15.04.2020	36	522	558	6.45
14.04.2020	744	16.04.2020	0	0	0	Results not received
		17.04.2020	1	509	510	0.20
		18.04.2020	1	234	235	0.43
15.04.2020	762	19.04.2020	30	732	762	3.94
Total			68	1997	2065	3.26 (Overall)

Time Lag: Mean time lag in testing and result 2.9 Days with SD 1 day

This college found 68 positive cases in these 6 days of starting testing. Mean age of these 68 positive cases was 40.8 Years with SD 15.3 years and M:F =1.96. Out of these 68 positive cases, majority (48.5%) of cases were in 31-45 years age group followed by 16-30 years, 45-60 years, above 60 years and less than 16 years. (Table 2, Figure 2 & 3)

TABLE 3

AGE AND SEX WISE DISTRIBUTION OF nCOVID-19 POSITIVE cases

S. No.	Age Groups	Females		Males		Total	
		Number	%	Number	%	Number	%
1	(1) <16 Years	1	4.3	2	4.4	3	4.4
2	(2) 16-30 Years	6	26.1	7	15.6	13	19.1
3	(3) 31-45 Years	11	47.8	22	48.9	33	48.5
4	(4) 46-60 Years	3	13.0	7	15.6	10	14.7
5	(5) Above 60 Years	2	8.7	7	15.6	9	13.2
	Grand Total	**23**	100.0	**45**	100.0	**68**	100

Age: Mean age of positive cases 40.8 Years with SD 15.3 years M:F =1.96

Figure 1

Date wise Positivity Rate

Figure 2

Sex wise distribution of Positive cases (N=68)

Figure 3

Age wise distribution of Positive cases in Percentage (N=68)

Figure 4

Residence wise distribution of Positive cases in percentage (N=68)
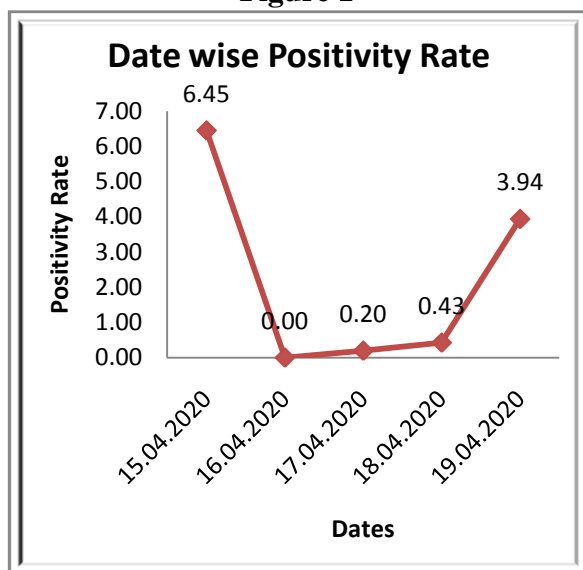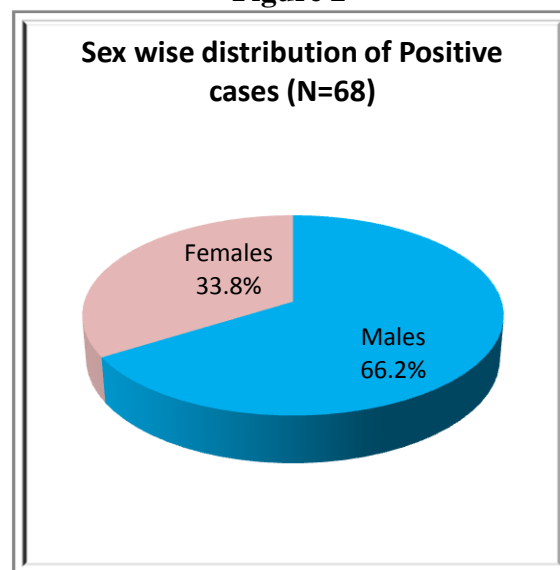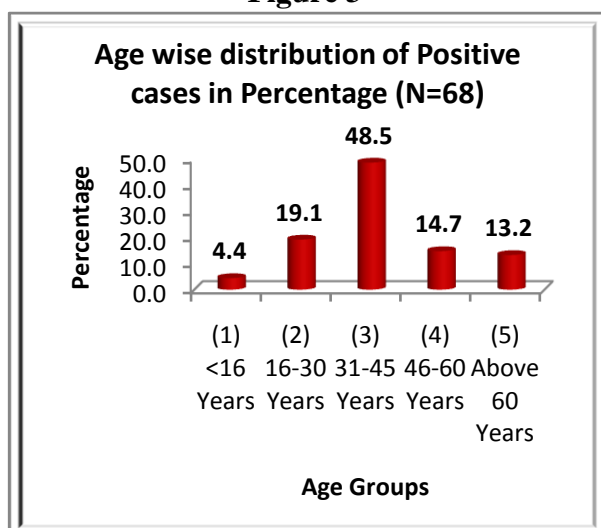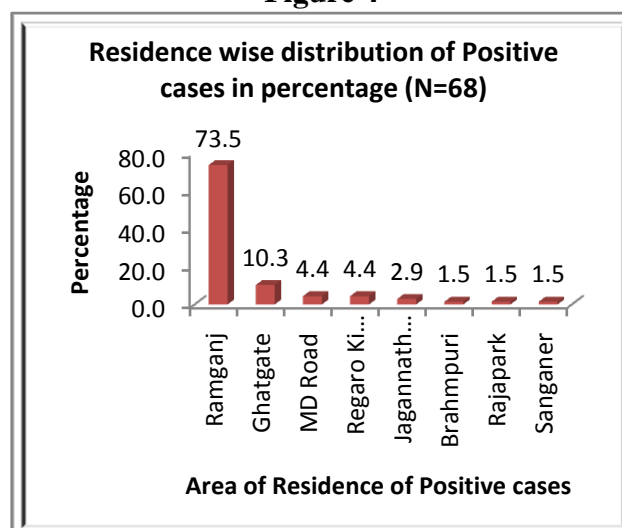
All the 68 positive cases were from Jaipur majority (73.5%) residing in Ramganj area followed by Ghatgate, MD Road, Regaro Ki Kothi, Jagannath Sahay Ka Rasta, Brahmpuri, Rajapark and Sanganer. (Table 3 & Figure 4)

TABLE 4

RESIDENCE WISE DISTRIBUTION OF nCOVID-19 POSITIVE CASES

S. No.	Area	Number	%
1	Ramganj	50	73.5
2	Ghatgate	7	10.3
3	MD Road	3	4.4
4	Regaro Ki Kothi	3	4.4
5	Jagannath Sahay Ka Rasta	2	2.9
6	Brahmpuri	1	1.5
7	Rajapark	1	1.5
8	Sanganer	1	1.5
	Grand Total	**68**	100.0

IV.   DISCUSSION

In the present study, total 2065 samples were tested, out of that 68 were found positive. Overall positivity rate was found 3.26% and mean time lag was found 2.9 days with standard deviation of one day. In India studies are not available regarding positivity rate of samples tested for nCovid-19 by RT-PCR. Studies are available mainly from China as this epidemic first emerge in Chiana.

One of the study conducted in a hospital of Wuhan city of China on 4880 cases reported 38% positive rate of RT-PCR detection of SARS-CoV-2 infection.[14] In another study from Wuhan China conducted on 1014 suspected symptomatic cases of nCovid-19, reported 59% (601/1014) positivity rate of the samples.[15] Yang Y etall[16] did a study for evaluating the accuracy of different respiratory specimens in the laboratory diagnosis and monitoring the viral shedding of 2019-nCoV infections and found the positivity rate varies from 30% to 60%.

These studies found very high positivity rate in comparison to present study. The reason may be because these all studies are from China and China was the first country reported nCovid-19 cases, so there are more cases of nCovid-19 as comparison to India. Another reason may be because in China the infectivity of the virus is more, so cases on nCovid-19 were there in China as compared to India.

In another study it was found that positive test result was highest at week one (100%), followed by 89.3%, 66.1%, 32.1%, 5.4% and zero by week six.[17]

It was also reported that the positive rate of PCR for oropharyngeal swabs is not very high: only 53.3% of COVID-19-confirmed patients had positive oral swabs tests.[18] In another series of 51 patients with confirmed COVID-19 infection, 71% patients were RT-PCR positive at the first time of testing of throat swab.[19]

Another fact was observed regarding RT-PCR testing for nCovid-19 that the RT-PCR results usually become positive after several days (2-8 days) of infection.[20]

Yang Y etall[16] also reported that a number of external factors may affect this positivity of RT-PCR in diagnosing nCovid-19 like specimen source, sampling time, performance of kits etc.

V.   CONCLUSION

In the present study, positivity rate of RT-PCR test for nCovid-19 was found 3.26% and mean time lag was found 2.9 days with standard deviation of one day. Among positive cases found majority were in 45-60 years age groups with M:F 1.96. All the positive cases were from Jaipur and 73.5% were from Ramganj area only. As positivity is quite high and majority of positive cases were from Ramganj area so containment measures should be directed mainly towards this area.

CONFLICT OF INTEREST

None declared till now.

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