



Epidemiology of Covid-19 Positive Patients Admitted In a Dedicated Covid Hospital

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ABSTRACT

Introduction: The pandemic of Covid-19 was declared on 11 march 2020 by WHO.

Methods: The study was carried out in a dedicated Covid 19 hospital on 1493 patients. All patients who tested positive for Covid-19 by RTPCR were included in the study and the outcome was analysed.

Result: Most of the patients were symptomatic (64.97%). The asymptomatic patients recovered faster than symptomatic and the difference was statistically significant. The most common symptoms were fever (38.3%), tiredness (20.6%) and cough (17.8%). Only 0.8% patients died due to the novel corona virus.

Conclusion: The mortality due to the virus in India is not alarming and we need to consider starting focusing back on other diseases as well. The mean age of the deceased was 58.42 which highlights that elderly at a greater risk to succumb to disease and hence should be preferred for as priority one for vaccination against the disease. The numbers of Covid-19 cases have reduced considerably over last few months in the country, but this does not mean that the pandemic has gone away. We need to be cautious, use this opportunity to vaccinate the maximum population to prevent second wave of the disease

Key Words: Covid-19, herd immunity, vaccination, mortality, RTPCR

INTRODUCTION

Corona viruses are large group of virus that infect both humans and animals. Novel Corona virus (Covid-19) started from China.¹ Covid-19 was declared pandemic by WHO on 11 march 2020.^{2,3}

The complete epidemiology of the disease is not yet fully understood. Patients are the main source of infection. It is now clear that the virus is transmitted mainly through airborne route. Infection occurs when droplets generated during coughing, sneezing, talking or blowing nose are inhaled by other person in close contact. These droplets can land on the surfaces of the nearby objects. Other person can also get infected when he/she touches these infected sur-

faces by hand and then touches his nose, mouth or eyes.^{1,4-6}

Studies have found that the median incubation period is 5.1 days (Range 2-14 days).^{1,7,8} However few unusual cases of longer incubation period of 19 days have also been found.^{9,10} The 19-day incubation period is a low probability event, and experts suggest 14 days for quarantine.

Patients can be completely asymptomatic or present with symptoms like fever, cough, fatigue, shortness of breath, myalgia, arthralgia, loss of taste/smell, rhinorrhoea, and diarrhea. Patient may present with unusual or atypical symptoms specially immune compromised and elderly.^{1,11-13}

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The severity of COVID-19 was defined on the basis of the clinical features, laboratory testing, and chest radiograph imaging, including asymptomatic and symptomatic cases as mild, moderate, severe, or critical.¹

Use of masks, social distancing, use of sanitizers, frequent hand washing, avoiding crowded places and partial to complete lockdowns in the country are the measures followed to prevent the spread of the disease.¹⁴⁻¹⁶ How far these preventive measure have been effective in controlling the spread of infection is a point of further discussion and research.

Identification, isolation and caring for patients early are essential to limit human-to-human transmission including reducing secondary infections among close contacts and health care workers, preventing transmission amplification events.¹ Beyond doubt it is certain that the best way to prevent the infection and end the pandemic of Covid-19 is by attaining herd immunity by immunisation.¹⁴ However percentage of population that needs to be vaccinated to attain herd immunity is not known and is a matter of research. Similarly other matters of research are, how long the immunity against virus will last after initial doses of vaccination? Which immunity is longer lasting that achieved through vaccination or natural infection is not known. In short a lot of questions about the epidemiology of the disease, its prevention and management are still in grey area and requires further research.

In present study we have tried to fill some gaps about the epidemiology of the Covid-19 infection.

METHODOLOGY

The study was conducted at Govt approved dedicated Covid-19 hospital in North-Bengal from Jun to Nov 2020. Patients were managed as per the guidelines issued from MoHFW.^{17,18}

It is a prospective observational study. All the patients who were suspected to be Covid-19 were tested by RTPCR. All Covid-19 positive patients were then admitted in the study centre. Contact tracing of the positive patients was carried out, and all the high risk contacts were also tested by RTPCR. All patients who tested Covid-19 positive were included in the study. The RTPCR tests were done from ICMR approved lab. Consent from the participants was taken before including in the study. Approval from institutional ethics committee was taken.

The data was collected in a pre-structured questionnaire. Epidemiological determinants of these patients were studied. The data was analysed using SPSS software version 23.

Definitions:

Covid-19 patient: Patient who tested positive by RTPCR.

Cured/recovered: Patient was considered cured or recovered when they tested negative by repeat RTPCR.

RESULTS

A total of 4890 patients were tested, out of which 1493 (30.53%) patients were found Covid-19 positive and treated during the study period. All the Covid-19 positive patients were included in the study.

Mean age of cases was 33.75 years with male preponderance (95.6%), similar to previous studies.^{19,20}

Most of the patients were symptomatic (64.97%), while only 34.23% patients were asymptomatic. The finding similar to previous studies^{20,21} and in variance from study conducted in China.²²

Table 1: Characteristics of Covid-19 Positive cases (Original)

Variables	Total cases (%)	95%CI
Gender		
Male	1427(95.6)	
Female	65 (4.4)	
Age		
Range	1-88 years	
Mean	33.75	
Std deviation	10.21	
Symptoms		
Symptomatic	970 (64.97)	0.625-0.674
Asymptomatic	523 (35.03)	0.326-0.375
Outcome		
Recovered	1481 (99.2)	0.987-0.996
Dead	12 (0.8)	0.004-0.013
Recovery Time (n=1481)		
Range	3-49 days	
Mean	12.95 days	
Std deviation	4.42	
Recovery Time (days)		
Asymptomatic		
<10	239 (45.5)	
>10	286 (54.5)	
mean	11.47 days	
Symptomatic		
<10	186 (19.5)	
>10	770 (80.5)	
mean	13.78 days	

CI= Confidence Interval

Table 2: Most common symptoms amongst Covid-19 positive patients (Original)

Attribute	Cases (%)	95% CI
Fever	572 (38.3)	0.36-0.41
Tiredness	308 (20.6)	0.186-0.227
Rhinorrhea/nasal stuffiness	251 (16.8)	0.149-0.187
Body aches including arthralgia	188 (12.6)	0.109-0.149
Headache	141 (9.4)	0.008-0.109
breathlessness	73 (4.9)	0.038-0.060
Loss of taste/smell	20 (1.3)	0.008-0.019
Diarrhoea	14 (0.9)	0.004-0.014
Co morbidities	49 (3.3)	0.024-0.042

CI= Confidence Interval

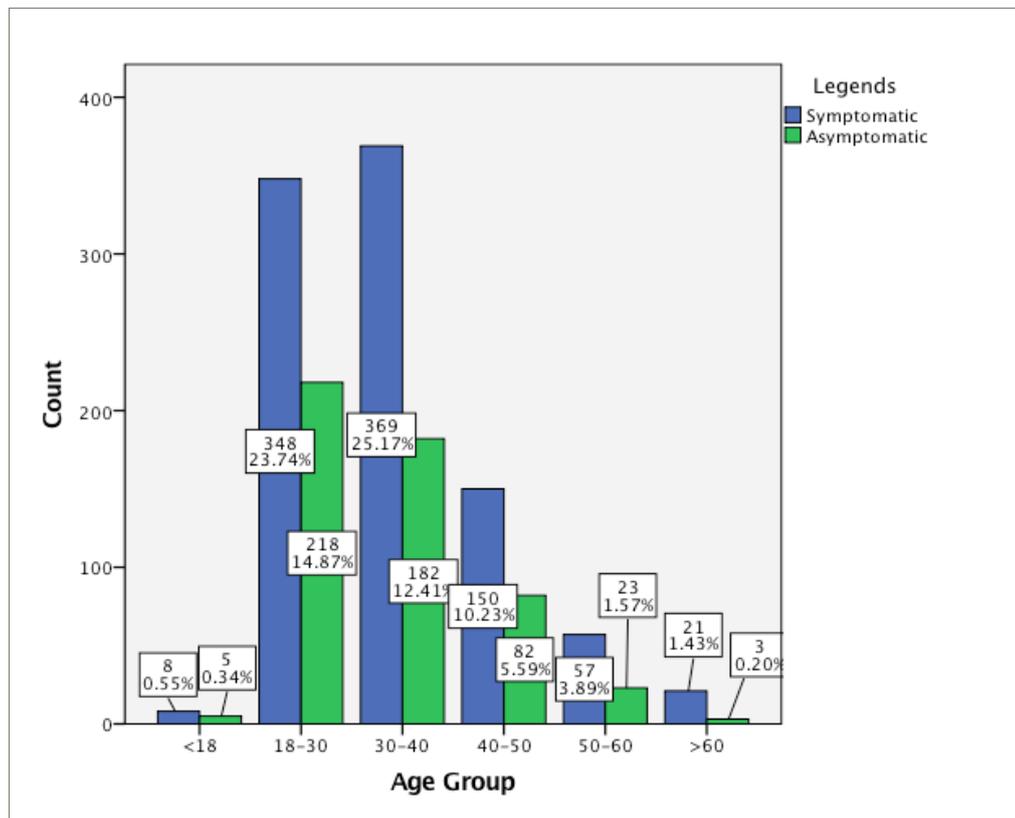


Figure 1: Distribution of cases as per age

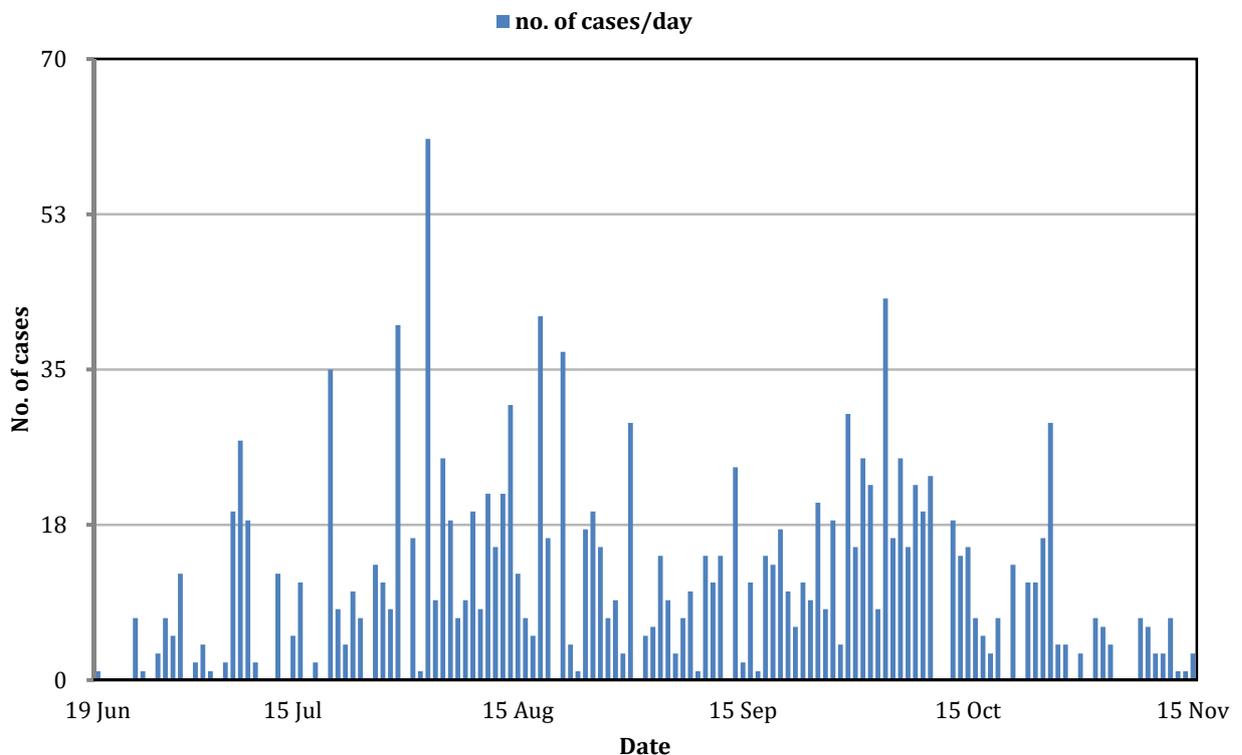


Figure 2: Number of new covid-19 cases/day

The difference in recovery time for symptomatic and asymptomatic cases was analyzed using chi square test and it was found that recovery time of asymptomatic patient was lower than that of symptomatic

patient and there was significant difference between the two groups. ($X^2= 112.54, D.F=1 N=1481, p\text{-value}= <0.00001$). These highlights that asymptomatic have shorter duration of viral shedding than sympto-

matic and this could be due to better immunity of these patients against the virus. The finding is in variance with the study conducted in China.²²

The most common symptom amongst the patients was Fever (38.3%) followed by tiredness (20.6%) and cough (17.8%). The presenting symptom of patients is shown in the table (multiple responses).

DISCUSSION

The daily new cases reached its peak of in early Aug 20 followed by a second peak in Oct 20. Till then the number of new cases per day have declined to near zero. The average no of new cases per day during the study period was 10. The occurrence of daily new cases/day graph is similar to national graph.^{23,24} The reduction of new cases/day has occurred in spite of the fact that there has been lifting of various bans national wide and increase in the no of testing centers. This reduction could be probably due to achievement of herd immunity amongst general population through natural infection. However larger studies to evaluate the attainment of herd immunity needs to be done. Also longitudinal studies to determine the period for which this immunity lasts needs to be done. Studies suggest the immunity after natural infection is short lived²⁵, therefore we expected that sporadic outbreaks of the disease to occur off and on for years. Two vaccines against Covid-19 are now available in country, however how long the protection will be offered and how frequently booster doses will be required to achieve the herd immunity is not known. Attainment of herd immunity against the disease through vaccination is the best method to curb the pandemic. But percentage of vaccination coverage required to attain the herd immunity is to be researched.

There were 12 (0.8%) Covid-19 positive deaths during the study period which is similar to national data.^{23,24} However the death rate is much lower than other countries.²⁶⁻²⁸ This could be due to the fact that corona viruses are zoonotic,²⁹⁻³¹ India being an agricultural state; there is constant interaction with animals. This could have caused cross immunity to Covid-19 virus. To some extent low mortality rate can also be attributed to underreporting. But since the difference is quite large, it's obvious that there is more than one factor which have attributed to low mortality due to the infection as compared to other counties and this draws attention towards research to find out these factors. The characteristics of deceased were compared with those who recovered. It was found that there is significant difference between mean age of deceased (mean=58.42 years) and recovered (mean=33.54), (p value <0.0001 at 95% CI). It indicates that elderly are at greater risk of succumbing to the disease as compared to children and young adults. Hence population above 50 should be preferred as priority one for vaccination against the disease.

CONCLUSION

Asymptomatic cases of covid-19 are most common and they recover faster as compared to symptomatic ones. Fever, tiredness and cough are the most common symptoms. Death rate due to covid-19 is very low therefore we should need to focus back on others diseases which are still the maximum contributors of death in India. This is not trivializing Covid-19 but a message that in order to defeat Covid-19 others diseases should not get neglected and we should not deviate from the goal of improving the overall public health status of the country. The pandemic due to Covid-19 has now crossed its peak and the cases are declining. The downfall in number of cases is probably due to attainment of herd immunity through natural infection. This highlights that the actual number of Covid-19 cases in the country could have been much larger than what is reported. How long the immunity due to natural infection will last is not known, however going by the fact that immunity due to infection by other corona viruses is short lived we assume that sporadic outbreaks of the disease is highly possible. Mass vaccination to cover maximum people as early as possible is warranted to end the pandemic. High risk groups like people above 50 years, health care workers and front line workers should be given priority during vaccination.

BIBLIOGRAPHY

1. India G of M of H and FW. Clinical Management Protocol: COVID-19, MHFW, GoI. 2020; Available from: <https://www.mohfw.gov.in/pdf/ClinicalManagementProtocolforCOVID19.pdf>. Accessed Feb 1st, 2021.
2. WHO Director-General's opening remarks at the media briefing on COVID-19 - 8 June 2020. Available from: <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---8-june-2020.html>. Accessed Feb 3rd, 2021.
3. Cucinotta D, Vanelli M. WHO Declares COVID-19 a Pandemic. *Acta Biomed.* 2020;91(1):157-160.
4. Zhang AL, Wang Y, Molina MJ. Erratum: Identifying airborne transmission as the dominant route for the spread of COVID-19. *Proceedings of the National Academy of Sciences of the United States of America.* 2020;117:14857-14863
5. Coronavirus disease (COVID-19): How is it transmitted? Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19-how-is-it-transmitted.html>. Accessed Feb 4th, 2021
6. Commentary E. COVID - 19 : Epidemiology and Public Health Aspects. 2020;111-6.
7. Zhou L, Med M, Tong Y, Ph D, Ren R, Med M, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia. 2020;1-9.
8. Centers US, Control D. The Incubation Period of Coronavirus Disease 2019 (COVID-19) From Publicly Reported Confirmed Cases : Estimation and Application Objective : To estimate the length of the incubation period of COVID- Design : Setting : News reports and press releases f. 2020;2-3.
9. Bai Y, Yao L, Wei T, Tian F, Jin DY, Chen L, et al. Presumed Asymptomatic Carrier Transmission of COVID-19. *American Medical Association;* 2020;323 p. 1406-7.

10. Zhai P, Ding Y, Wu X, Long J, Zhong Y, Li Y. The epidemiology, diagnosis and treatment of COVID-19. *International Journal of Antimicrobial Agents* 2020;55.
11. Terms U, Province H. Coronavirus disease 2019 (COVID-19): Epidemiology, virology, and prevention. 2020;2019:1-31.
12. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Articles Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. 2020;6736(20):1-10.
13. Chowdhury SD, Oommen AM. Epidemiology of COVID-19. *Journal of digestive endoscopy*. 2020;11(1):3-7.
14. Coronavirus disease (COVID-19): Herd immunity, lockdowns and COVID-19. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/herd-immunity-lockdowns-and-covid-19.html>. Accessed Feb 5th 2021
15. Advice for the public [Internet]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public.html>. Accessed Feb 5th
16. India, Day 1: World's Largest Coronavirus Lockdown Begins – The New York Times [Internet]. Available from: <https://www.nytimes.com/2020/03/25/world/asia/india-lockdown-coronavirus.html?auth=link-dismiss-google1tap>. Accessed on Feb 05th, 2021.
17. Ministry of health and family welfare, directorate general of health services, EMR division. Guidelines to be followed on detection of suspect/confirmed COVID-19 case in a non-COVID Health Facility. New-delhi, India: MoHFW.2020 p 1-3.
18. Ministry of health and family welfare. Guidelines on Clinical management of severe acute respiratory illness (SARI) in suspect/confirmed novel coronavirus (nCoV) cases. New-delhi, India: MoHFW.2020 p 1-11
19. Agarwal N, Biswas B, Lohani P. Epidemiological determinants of COVID-19 infection and mortality: A study among patients presenting with severe acute respiratory illness during the pandemic in Bihar, India. *Niger Postgrad Med J*. 2020; 27(4): 293-301.
20. Bhandari S, Shaktawat AS, Sharma R, Dube A, Kakkar S, Banerjee S, et al. A preliminary clinico-epidemiological portrayal of COVID-19 pandemic at a premier medical institution of North India. *Ann Thorac Med*. 2020;15(3):146-50.
21. Sakurai A, Sasaki T, Kato S, Hayashi M, Tsuzuki S, Ishihara T, et al. Natural History of Asymptomatic SARS-CoV-2 Infection. *N Engl J Med*. 2020;383(9):885-6.
22. Long QX, Tang XJ, Shi QL, Li Q, Deng HJ, Yuan J, et al. Clinical and immunological assessment of asymptomatic SARS-CoV-2 infections. *Nat Med*. 2020;26(8):1200-4.
23. India Coronavirus: 10,847,790 Cases and 155,195 Deaths - Worldometer [Internet]. Available from: <https://www.worldometers.info/coronavirus/country/india/html>. Accessed Feb 9th, 2021.
24. India: WHO Coronavirus Disease (COVID-19) Dashboard | WHO Coronavirus Disease (COVID-19) Dashboard. Available from: <https://covid19.who.int/region/searo/country/in.html>. Accessed Feb 9th, 2021.
25. Episode #18 - COVID-19 - Immunity after recovery from COVID-19. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/media-resources/science-in-5/episode-18-covid-19-immunity-after-recovery-from-covid-19.htm>. Accessed Feb 9th, 2021.
26. • COVID-19 mortality rate by country | Statista. Available from: <https://www.statista.com/statistics/1105914/coronavirus-death-rates-worldwide/html>. Accessed Feb 9th, 2021.
27. WHO coronavirus (Covid-19) Dashboard. Available from: <https://covid19.who.int/table.html>. Accessed Feb 9th, 2021.
28. India's COVID-19 Mortality Too Low to Divert All Our Attention Away from Other Diseases - The Wire Science. Available from: <https://science.thewire.in/health/indias-covid-19-mortality-is-too-low-to-warrant-closure-of-other-health-services/>. Accessed Feb 9th, 2021.
29. Coronavirus | WHO | Regional Office for Africa [Internet]. Available from: <https://www.afro.who.int/publications/coronavirus.html>. Accessed Feb 9th, 2021.
30. MacKenzie JS, Smith DW. COVID-19: A novel zoonotic disease caused by a coronavirus from China: What we know and what we don't. *Microbiol Aust*. 2020;41(1):45-50.
31. WHO EMRO | Questions and answers | COVID-19 | Health topics. Available from: <http://www.emro.who.int/health-topics/corona-virus/questions-and-answers.html>. Accessed Feb 9th, 2021.