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Original Research Article

Epidemiological profile of COVID-19 patients admitted in Palakkad district- a descriptive study

Shilu M. Zachariah*, Sreedevi Chakkanmattil, Divyamol Nallat, Deepak K. Soman

Department of Community Medicine, Government Medical College, Palakkad, Kerala, India

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***Correspondence:**
Dr. Shilu M. Zachariah,
E-mail: shiluzachariah@gmail.com

ABSTRACT

Background: The World Health Organization (WHO) declared coronavirus disease 2019 (COVID-19) a public health emergency of international concern. There is paucity of published data from India especially regarding the epidemiological information of COVID-19 patients and factors affecting the length of hospitalization.
Methods: The objectives of the study are to determine the epidemiological profile of COVID-19 patients and to determine the factors associated with their duration of hospital stay. The study is a descriptive study which includes all COVID-19 patients admitted to COVID-19 treatment centres of Palakkad district from 23 May 2020 to 30 June 2020.
Results: A total of 467 patients were obtained constituting 362 (77.5%) males and 105 (22.5%) females. The mean age was 36.52±14.44 years. 84 (17.99%) patients had comorbidities and 53 (11.35%) were symptomatic. The mean duration of hospital stay was 13.00±5.79 days (IQR 9-15). Symptomatic patients had higher odds of having a longer hospitalization compared to asymptomatic patients and this was found to be highly significant. Presence of comorbidities was also associated with longer duration of hospital stay which was significant.
Conclusions: A knowledge about the length of hospital stay will be crucial in determining the necessary infrastructure and manpower to manage the COVID-19 patients. If careful planning of health resources allocation is done, it will prevent undue overburdening of the health systems especially during a surge of COVID-19 cases.

Keywords: COVID-19, Epidemiological profile, Length of hospital stay

INTRODUCTION

At the end of 2019, several cases of pneumonia with unknown etiology emerged in Wuhan, Hubei Province, China.[1-3] On 07 January 2020, a novel coronavirus was identified in the throat swab sample of one patient by the Chinese Center for Disease Control and Prevention (CDC), and was subsequently named as 2019-nCoV by World Health Organization (WHO).[1,2]

According to the WHO report, 2019-nCoV is a unique virus that causes respiratory disease, which spreads via oral and nasal droplets. Moreover, the pathogen of COVID-19 can float in the air in the form of aerosols and cause infection in healthy people [4].

In India, the first case of COVID-19 was identified on 30 January 2020 and the number increased steadily due to local transmission and foci of community transmission.[5] As of 14 April 2020, the number of cases in India was 11,485 with overall reported mortality of 396.[6]

India lacks basic and comprehensive epidemiological information such as sociodemographic profile, risk factors, and comorbidities, modes of transmission and its dynamics, clinical presentations, the different testing strategies and its positivity rates, and clinical outcomes.[7] There is paucity of published data from India especially regarding the epidemiological information of the patients. Epidemiological data will be useful to implement control measures with respect to COVID-19.

Aims and objectives

Aims and objectives of the study include: to determine the epidemiological profile of COVID-19 patients, and to determine the factors associated with duration of hospital stay for COVID-19 patients.

METHODS

A descriptive study was conducted based on secondary data of COVID-19 patients from COVID-19 contact tracing cell (CCTC) of Government Medical College (GMC), Palakkad. The CCTC was established for the district during the initial phase of the pandemic when the first cases of COVID-19 were reported among international returnees to the state of Kerala. The activities of the CCTC included collecting pertinent details of the diagnosed COVID-19 patients, their travel history and also gathering details regarding the number of contacts of each patient. The sample size included all COVID-19 patients admitted to COVID-19 treatment centres from 23 May 2020 to 30 June 2020.

Operational definition

Laboratory confirmed case

A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.[8]

Inclusion criteria

All laboratory confirmed COVID-19 patients' diagnosed using reverse transcriptase-polymerase chain reaction (RT-PCR) test, rapid antigen test and admitted to COVID-19 treatment centres were included in the study.

Exclusion criteria

COVID-19 patients diagnosed during postmortem were excluded from the study.

The data was entered into excel sheet and analysed using statistical package for the social sciences (SPSS) 20 trial software. The data is expressed in terms of proportions, mean and standard deviation. Logistic regression analysis was used to find out risk factors associated with length of hospital stay.

RESULTS

A total of 467 patients were obtained constituting 362 (77.5%) males and 105 (22.5%) females. The mean age was 36.52±14.44 years. Majority i.e. 163 (35.1%) belonged to the age group 30-45 years.

Majority i.e. 176 (53.2%) out of 331 patients were unskilled workers followed by 57 (17.2%) of skilled workers. About 17 (3.6%) were health care workers.

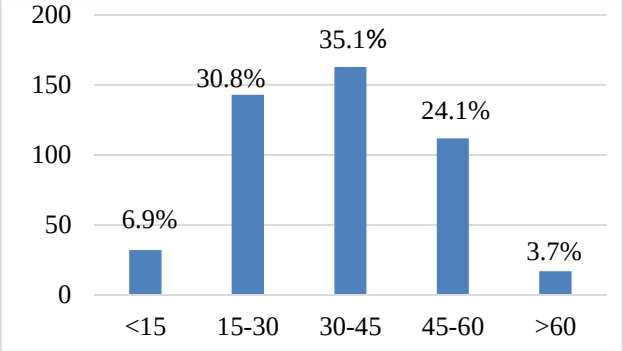

Figure 1: Age distribution of COVID-19 positive cases (n=465).

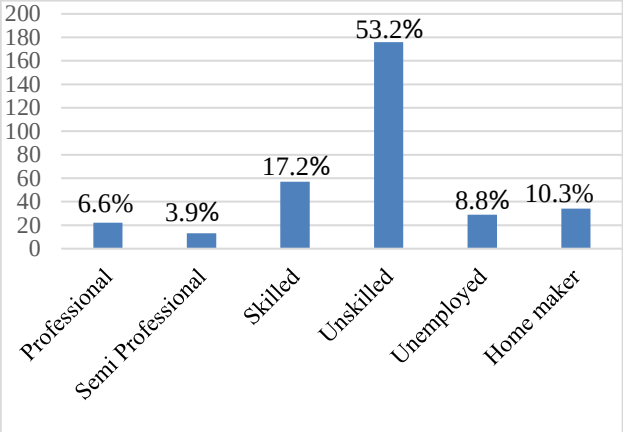

Figure 2: Distribution of COVID-19 positive patients based on occupation (n=331).

386 (82.66%) belonged to rural area while 81 (17.34%) belonged to urban area of the district.

422 (90.4%) were travellers while 40 (8.6%) were contacts and 5 (1.1%) were unknown source. 211 (50.0%) of the travellers were international travellers and 211 (50.0%) were domestic travellers.

84 (17.99%) patients had comorbidities. 414 (88.65%) patients were asymptomatic while 53 (11.35%) were symptomatic.

The mean duration of hospital stay was 13.00±5.79 days (IQR 9-15). The mean duration between date of arrival of traveler and diagnosis of COVID-19 was 9.17±5.89 days. 2 deaths (0.42%) occurred among the patients admitted during this study period.

We analysed data for 254 patients (complete data was available) using logistic regression to determine factors associated with duration of hospital stay. Symptomatic patients had higher odds of having a longer hospitalization compared to asymptomatic patients and this was found to be highly significant. Presence of comorbidities was also associated with longer duration of hospital stay which was significant.

Table 1: Logistic regression analysis to determine factors associated with duration of hospital stay.

Variable	Hospital stay (%)		P value	Odds ratio
	<15 days	≥15 days		
Age				
<15	4 (66.7)	2 (33.3)	0.115	1
15-30	58 (70.7)	24 (29.3)	0.833	0.83 (0.14-4.82)
30-45	73 (77.7)	21 (22.3)	0.539	0.58 (0.10-3.36)
45-60	43 (70.5)	18 (29.5)	0.845	0.84 (0.14-4.98)
>60	4 (36.4)	7 (63.6)	0.241	3.50 (0.43-28.45)
Gender				
Male	139 (69.5)	61 (30.5)		1.71 (0.83-3.55)
Female	43 (79.6)	11 (20.4)	0.143	1
Asymptomatic/symptomatic				
Asymptomatic	167 (75.6)	54 (24.4)		1
Symptomatic	15 (45.5)	18 (54.5)	<0.001	3.71 (1.75-7.86)
Comorbidity				
No	155 (75.2)	51 (24.8)		1
Yes	27 (56.3)	21 (43.8)	0.010	2.36 (1.23-4.54)
Exposure				
Contact	27 (81.8)	6 (18.2)	0.355	1
Traveller	150 (69.4)	66 (30.6)	0.150	1.98 (0.78 – 5.02)
Unknown	5 (100)	0(0)	0.99	0

DISCUSSION

In our study, the median age of the patients was 35 years (range 1-83 years). This was similar to a study from Beijing and other parts of China which also reported a wide age range i.e. from 1 to 94 years of age.[9] It is suggested that people of all ages and sexes could be susceptible to COVID-19.[8]

Majority of the patients i.e. 35.1% belonged to the age group 30-45 years. Males and females comprised 77.25% and 22.5% of the study population respectively. In a study from Karnataka on COVID-19 positive patients, majority of the patients were male (70.8%) and belonged to the age group of 21–40 years (48.3%).[10] The patients in our study mainly constituted international and domestic travelers who were returnees to their home state during the pandemic and therefore, most patients belonged to the productive age group.

84 (17.99%) patients had comorbidities. This is similar to a study in Vietnam where 11.3% of patients had co-existing disorders.[8] Patients with comorbidities have been shown to have a greater risk of symptomatic infection with COVID-19, with a worse prognosis than those without.[11] In our study 88.65%patients were asymptomatic while 11.35% were symptomatic.

The mean duration of hospital stay was 13.00±5.79 days (median of 11 days). The median length of stay was 7 days overall and 17 days for those older than 80 years in a study from Tamil Nadu.[12] The median length of stay among COVID-19 patients with definitive outcomes was 17 days (IQR: 15–20) in a study from Karnataka.[10] A study which was done among 538 confirmed patients between January and March 2020 in China found that the median hospital stay was 19 days with interquartile range of 14 to 23 days and it was influenced by age, serious illness, and density of health care workers.[13]

In studies from China and Vietnam, the median duration of hospital stay was 12 and 21 days respectively.[8,14] However, in the United States and several European countries, the duration of hospital stay is shorter with an average of 7–8 days.[15-17] This difference has been attributed to a difference in strategies for the prevention and control of COVID-19. In the United States or several European countries where the average duration of stay for COVID-19 patients was shorter, suspected or confirmed patients with mild symptoms were being encouraged to self-isolate. Therefore, people admitted to hospitals were often in severe or critical condition.[8] Moreover, the criteria for discharge of patients from isolation also plays a role. Accordingly, the discharge criteria at the time stipulated that patient had to recover clinically and also two negative RT-PCR results on sequential samples taken at least 24 hours apart.[18,19]

Within the clinical management of COVID-19 interim guidance published on 27 May 2020, WHO updated the criteria for discharge from isolation as part of the clinical care pathway of a COVID-19 cases patient.[20] These criteria apply to all COVID-19cases regardless of isolation location or disease severity.

Criteria for discharging patients from isolation (i.e. discontinuing transmission-based precautions) without requiring retesting: for symptomatic patients - 10 days

after symptom onset, plus at least 3 additional days without symptoms (including without fever and without respiratory symptoms); for asymptomatic cases - 10 days after positive test for SARS-CoV-2.[21]

In our study, we found that symptomatic patients and those with comorbidities had longer hospitalization. Age, residence and sources of contamination were significantly associated with longer duration of hospitalization in the study from Vietnam. Presence of more than two comorbidities was found to be an important factor influencing length of hospital stay in the study from Tamil Nadu.[12]

There was no significant association between age and duration of hospitalization in our study. There was no difference in the length of hospital stay by gender and age as reported in the study from Karnataka.[10] This is in contrast to other studies where older age has been found to be the main factor associated with hospitalisation in several studies.[9,15-17] This could be explained by the fact that most of the patients in our study period were from the productive age group.

As revealed by a study of China, a longer duration of disease/hospitalisation means a greater medical burden, especially when the transmission of COVID-19 might rapidly increase patient volumes, to the point of excessively exceeding healthcare capacities.[3] With the progression of global pandemic of COVID-19, the information on the duration of hospital stay and the survival of patients may be helpful in the planning of allocation of medical resources, improving treatment outcomes, and designing effective interventions.[22]

Limitations

The study did not assess the clinical severity of the patients and whether patients were admitted to intensive care units which would have a bearing on the length of hospital stay.

CONCLUSION

In conclusion, a knowledge about the length of hospital stay will be crucial in determining the necessary infrastructure and manpower to manage the COVID-19 patients. If careful planning of health resources allocation is done, it will prevent undue overburdening of the health systems especially during a surge of COVID-19 cases.

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REFERENCES

1. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020;395:497-506.
2. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet. 2020;395:507-13.
3. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. JAMA. 2020;323(11):1061-9.
4. WHO Director-General's opening remarks at the media briefing on COVID-19. 2020. Available at: https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-COVID-19. Accessed on 10 July 2020.
5. Andrews MA, Areekal B, Rajesh KR, Krishnan J, Suryakala R, et al. First confirmed case of COVID-19infection in India: A case report. Indian J Med Res. 2020;151:490-2.
6. Coronavirus in India: latest map and case count. Available at: https://www.covid19india.org. Accessed on 01 June 2020.
7. Gandhi PA, Kathirvel S. Epidemiological studies on coronavirus disease 2019 pandemic in India: Too little and too late? Med J Armed Forces India. 2020;76(3):364-5.
8. Thai PQ, Toan DTT, Son DT, et al. Factors associated with the duration of hospitalisation among COVID-19patients in Vietnam: A survival analysis. Epidemiol Infect. 2020;148:e114.
9. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID 1919) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. JAMA Int Med. 2020;323:1239-42.
10. Mishra V, Burma AD, Das SK, Parivallal MB, Amudhan S, Rao GN. COVID 1919-Hospitalized Patients in Karnataka: Survival and Stay Characteristics. Indian J Public Health. 2020;64(2):221-4.
11. Sanyaolu A, Okorie C, Marinkovic A, Patidar R, Younis K, Desai P. Comorbidity and its impact on patients with COVID-19. SN Compr Clin Med. 2020;2(8):1069-76.
12. Thiruvengadam G, Lakshmi M, Ramanujam R. A Study of Factors Affecting the Length of Hospital Stay of COVID-19 Patients by Cox-Proportional Hazard Model in a South Indian Tertiary Care Hospital. J Prim Care Comm Health. 2021;12.
13. Ji JS, Liu Y, Liu R. Survival analysis of hospital length of stay of novel coronavirus (COVID 19) pneumonia patients in Sichuan, China. medRxiv. 2020.

14. Guan W, Ni ZY, Hu Y, Liang WH, Ou CQ, et al. Clinical characteristics of coronavirus disease 2019 in China. N Engl J Med. 2020;382(18):1708-20.
15. CDC COVID-19 Response Team. Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) - United States. MMWR Morb Mortal Wkly Rep. 2020;69(12):343-6.
16. Lescure FX, Bouadma L, Nguyen D, Parisey M, Wicky PH, Behillil S, et al. Clinical and virological data of the first cases of COVID-19in Europe: a case series. Lancet Infect Dis. 2020;20(6):697-706.
17. Wise J. A third of COVID-19 patients admitted to UK hospitals die. BMJ. 2020;369:1794.
18. World Health Organization. Laboratory testing of human suspected cases of novel coronavirus (nCOV) infection (Interim Guidance). Available at: https://apps.who.int/iris/bitstream/handle/10665/330374/WHO-2019-nCoV-laboratory-2020.1-eng.pdf 10 January 2020. Accessed on 15 June 2020.
19. Government of Kerala. Revised guidelines for Testing, Quarantine, Hospital Admission and Discharge for COVID-19based on current risk assessment. Available at: http://dhs.kerala.gov.in/wp-content/uploads/2020/03/reg_1203 2020.pdf. Accessed on 16 July 2020.
20. World Health Organization. Coronavirus disease (COVID 1919) Situation Report – 129. 2020. Available at: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200528-COVID 19-sitrep-129.pdf. Accessed on 17 September 2020.
21. World Health Organization. Clinical management of COVID-19 (Interim Guidance) Available at: https://www.who.int/publications-detail/clinical-management-of-covid-19. Accessed on 13 October 2020.
22. Wang Z, Ji JS, Liu Y, Liu R, Zha Y, Chang X, et al. Survival analysis of hospital length of stay of novel coronavirus (COVID 19) pneumonia patients in Sichuan, China. medRxiv. 2020.

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