Original Research Article

Demographic and clinical profile of Covid-19 patients admitted at a tertiary care hospital in South India

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Abstract

Introduction: The COVID-19 pandemic emerged as a major public health emergency affecting healthcare services all over the world. It is essential to analyze the epidemiological and clinical characteristics of patients with COVID-19 in different parts of our country. This study highlights clinical experience in managing patients with COVID-19 at a tertiary care center in South India. It is pertinent to identify the clinical and demographic characteristics of patients considering the novelty and substantial heterogeneity of the illness across the world. The pathogen has been named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which has a phylogenetic similarity to SARS-CoV beta coronavirus.

Aim of the study: To assess the demographics, clinical characteristics, comorbidities, and outcomes of a cohort of patients with COVID-19.

Materials and methods: A record-based cross-sectional study. All cases were admitted in the covid ward of the Department of TB & Respiratory Disease, Government Hospital of Thoracic Medicine, Chennai from 26th June to 5th December 2020. A total of 2552 patients with confirmed covid-19 were included in the study. All the patients were analyzed in study demographics, clinical characteristics, comorbidities, and outcomes of a cohort of patients with COVID-19.

Results: 24 patients were excluded due to a lack of sufficient data. Of the remaining 976 in the early phase of the epidemic, males were admitted twice as much as females (67.1% and 32.9%, respectively). More than 8% reported no symptoms and the most common presenting symptoms were fever (78.3%), productive cough (37.2%), and dyspnea (30.64%). More than one-half (53.6%) had no co-morbidity. The major comorbidities were hypertension (23.7%), diabetes without (15.4%), and complications.

Conclusion: The majority of the patients with COVID-19 infection presenting to our hospital were young and asymptomatic. Fever was noted only in three-fourth of the patients and respiratory symptoms in half of them. Patients with comorbidities were more vulnerable to complications. Triaged classification of patients and protocol-based treatment resulted in good outcomes and low case fatality.

Key words

Corona, Covid-19, Lymphopenia in Covid-19, ARDS, Hypertension, Dyspnea.

Introduction

An unprecedented disease hit the world some time ago. The World Health Organization (WHO) declared this a coronavirus disease-19 (COVID-19) pandemic on 11th March 2020. It has affected over 21,756,357 and killed 771,635 people by 19/08/2020 when this report was prepared Many hospitals are now flooded with patients suffering from the COVID-19, presenting with a wide array of symptoms ranging from fever and respiratory distress to gastrointestinal symptoms [1]. The death count has been rapidly rising through the level (5.6%) has not reached the infliction by the other members of the coronavirus family causing human illnesses such SARS (13%) and MERS (35%). However, COVID is far more transmissible with an estimated reproduction number (R0) India too now is in the grip of the pandemic and, in terms of absolute numbers, the 3rd worst affected country after USA and Brazil. Early countrywide lockdown helped in delaying the spread and shift the peak and gave time to create infrastructure to face the surge [2]. Despite this, a total of 2,768,670 cases and 53,026 deaths have been reported in India as of 19/08/2020. This enormous number has overwhelmed the medical system and has resulted in shortages of medical equipment and personal protective equipment (PPE). Many hospitals across the country were designated as COVID-19 hospitals [3]. Despite the swift spread and the rapidly increasing number of people getting affected, the complete clinical course of this disease is still unclear for Indian patients. [4]. We report a relatively large study of 1000 patients with known outcomes to better understand the disease process and progression of COVID-19 cases and to study the factors affecting the outcome. This may help in triaging the rapid rise of patients and streamlining resources for better management of cases with optimal efficiency and better outcomes [5].

Materials and methods

A record-based cross-sectional study was done. All cases were admitted in the covid ward of the Department of TB and Respiratory Disease, Government Hospital of Thoracic Medicine, Chennai from 26th June to 5th Dec 2020. A total of 2552 patients with confirmed covid-19 were included in the study. All the patients were analyzed in study demographics, clinical characteristics, comorbidities, and outcomes of a cohort of patients with COVID-19. Inclusion criteria Individuals whose Nasopharyngeal swab for RT-PCR positive for COVID 19.Exclusion criteria: Severe COVID-19 patients, Negative RT-PCR. Epidemiological, clinical, laboratory and radiological characteristics and treatment and outcomes data were obtained with data collection forms from electronic medical records, and history given by 21 Covid-19 infected Patients were tested for Covid-19 by real-time reverse transcription-polymerase chain reaction (RT-PCR) assay of 2019-CoV RNA.

Statistical analysis: Statistical analysis was carried out using Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA, version 23.0 for Windows) and Microsoft Excel 2016. All quantitative data such as age, weight, hemodynamic parameters, and laboratory values were estimated using measures of central location (mean). Qualitative or categorical variables were described as proportions. The normality of quantitative data was checked by Kolmogorov-Smirnov tests of normality. For normally

distributed data, means were compared using an independent *t*-test. Mann-Whitney U-test was applied for statistical analysis of skewed continuous variables and ordered categorical variables. Univariate and multivariate logistic regression analyses were performed to analyze the effect of comorbidities (age >60 yr, diabetes mellitus and hypertension) on the severity of COVID-19. Mortality as an outcome measure couldnot be used as its number was low.

Results

Demographic details were as per **Table – 1**. Univariate and multivariate logistic regression analyses with 'hypoxia at admission' and 'critical illness' being the outcome variables with age >60 yr and presence of hypertension and diabetes mellitus as predictor categorical variables was as per **Table – 2**.

The most prevalent symptoms in our cohort were fever, which was present in 15% of the cohort, dry cough (54%), General weakness (23%), shortness of breath (22%), Myalgia & Headache were seen in 20%, GI symptoms Diarrhea in 30%, Vomiting/ Nausea was seen in 5.8% as per **Graph – 1**.

Table – 1: Demographic details.

Parameter	Without comorbidities (n=80)		With comorbidities (n=34)		P
	Median	Range	Median	Range	
Age (yr) (%)	30	13-59	50	22-29	
12-44ᵀ	71 (88.7)		14 (41.1)		
45-59ᵀ	9 (11.25)		11 (32.3)		
>60ᵀ	0		9 (26.4)		
Gender (%)					
Maleᵀ	50 (62.5)		16 (47)		
Femaleᵀ	30 (37.5)		18 (52.9)		
RR (/min)	20	16-24	20	16-26	
SpO₂ (%), room air	98	93-100	97	90-100	
Temperature (°C)	37	36.7-38.4	37	37-39	
SBP (mmHg)	120	100-160	129	88-206	
DBP (mmHg)	80	64-104	78	60-100	
NLR	1.9	0.6-22.5	2.3	0.7-47.5	
Fibrinogen (g/l)	3.3	1.5-8.0	4.5	1.2-7.9	
Ferritin (ng/ml)	86	8.1-1522	138.5	11.3-2000	0.047
CRP (mg/dl)	1.3	0.1-162	5.0	0.1-252	<0.001
Normalized D-Dimer#	0.7	0.0-83	1.0	0.1-25	0.021
LDH (U/l)	227	159-359	208	150-603	0.626
Pro-BNP (pg/ml)	5.1	3.0-138.5	40	4.1-105330	0.002
Trop T (pg/ml)	5.8	3.8-317	8.24	3.5-49.7	0.014
Procalcitonin (ng/ml)	0.0	0.0-0.4	0.0	0.0-7.0	0.211
Urea (mg/dl)	24	14-39	24.950	14-263	0.176
Creatinine (mg/dl)	0.7	0.4-1.2	0.7	0.2-12	0.334

#Normalized D-Dimer value (1 indicate 240 ng/ml); ᵀExpressed in number and percentage. RR, respiratory rate; SPO₂, oxygen saturation; HB, haemoglobin; TLC, total leucocyte count

Table – 2: Univariate and multivariate logistic regression analyses with 'hypoxia at admission' and 'critical illness' being the outcome variables with age >60 yr and presence of hypertension and diabetes mellitus as predictor categorical variables.

Outcome variable	Predictor variable	Univariate analysis		Multivariate analysis	
		Odds ratio/95% CI	P	Odds ratio/95% CI	P
Critical illness at admission	Age >60 yr	13.07 (2.55-66.84)	0.002	3.82 (0.53-27.13)	0.18
	Hypertension	12.15 (3.44-42.94)	0.001	4.51 (0.80-25.35)	0.87
	Diabetes	10.37 (2.91-37.11)	0.001	3.02 (0.52-17.3)	0.21
Hypoxia at admission	Age >60 yr	1.12 (0.12-10.01)	0.920	1.07 (0.94-12.23)	0.95
	Hypertension	1.88 (0.45-7.82)	0.385	0.41 (0.06-2.7)	0.36
	Diabetes	1.23 (0.242-6.26)	0.803	1.47 (0.17-12.51)	0.72

Graph – 1: Represent classification of severity of disease.
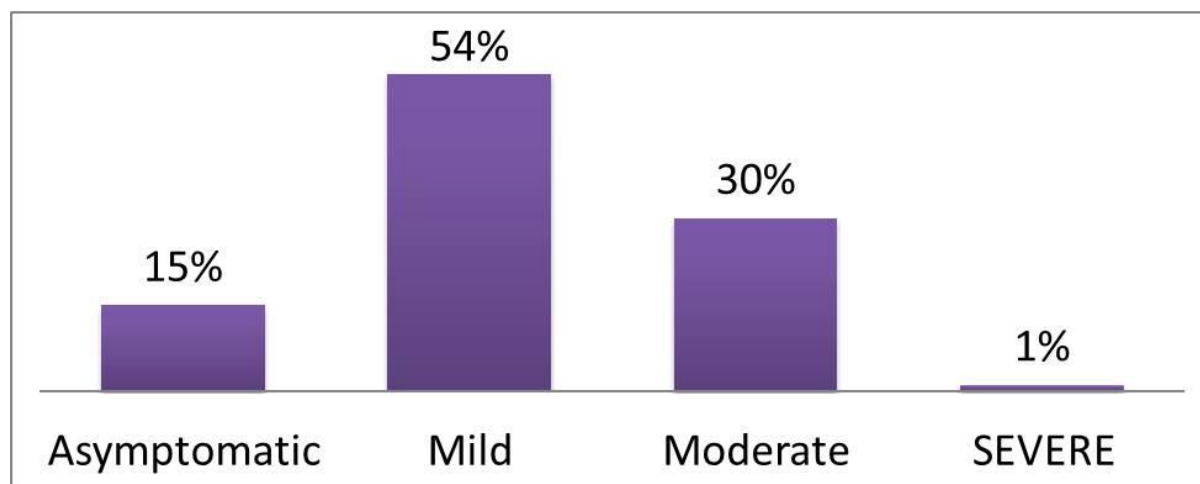
Discussion

SARS-CoV-2 is one of the most virulent pathogens causing severe acute respiratory illness along with MERS and swine flu in humans. Initial case studies from China demonstrated COVID-19 to be a respiratory illness with a spectrum ranging from mild illness (81%), severe respiratory distress (14%), and critical illness in five percent with a case fatality rate of around 2.4 percent [6]. Considerable disparities in demographic and clinical patterns have been observed between countries across different continents. This prospective study demonstrated the clinical profile and outcomes of initial COVID-19 patients from northern India. These patients were well categorized according to the severity and managed using standard protocols for investigations and treatment. fifty-eight percent of the patients in our study were asymptomatic at admission; all of them were followed closely, and only two out of 66 patients became subsequently symptomatic during the hospital stay [7, 8]. We found abnormalities in laboratory parameters in 25 percent of our asymptomatic patients. These observations reiterate the fact that asymptomatic patients need to be followed closely as some of them may progress to severe disease [9]. Another observation was an increased incidence of severe COVID-19 disease manifestations in patients with underlying chronic diseases (hypertension 16.6% and diabetes 14.9%). Similar findings

have been reported from various studies across the world. Various biomarkers have been shown to predict severe COVID-19 disease [10]. We also observed nearly the same results with high baseline levels of CRP, ferritin, and LDH and an NLR ratio of ≥3.5 along with hypoalbuminemia and deranged baseline creatinine, indicating severe COVID-19-related illness [11].

Two of our patients had acute myocardial insults during the hospital stay. COVID-19 is considered a hypercoagulable state, leading to venous thromboembolism in patients with severe disease Routine radiological screening for venous thrombosis was not performed [12]. A compression ultrasound was done only if peripheral venous thrombosis was clinically suspected (n=3), however, none of these patients had any evidence of venous thrombosis at imaging. This was despite 35 percent of patients having increased D dimer levels at admission. As per our institutional protocol, the early institution of heparin therapy based on D-dimers levels was strictly followed [13]. This intervention might have made a difference in preventing any thrombotic episodes in any of our patients. Steroids, especially dexamethasone, are now mainstay in the treatment of COVID-19 management after the results of the recovery trial have been published No benefit was observed in the use of steroids in patients with COVID-19 infection who were not hypoxic at admission

[14]. We did not routinely use corticosteroids in critically ill patients as part of our treatment protocol. Most of the patients having Covid-19 were male (66.66%) which was similar to that reported by WHO which show 73.0% male predominance but higher than that reported by Wang et al (54.3%). This male predominance may have happened due to increased foreign travel by males for occupational or educational purposes. Only 1 (4.76%) patient in our study had COPD as compared to that in Wu Z, et al. 7 (1.1%) [15]. Some patients also presented with lymphopenia with thrombocytopenia (14.28%). Lymphopenia was much more commonly seen in male patients (64.28%) as compared to females (28.57%). All patients requiring oxygen support, presented with lymphopenia indicating, that occurrence of lymphopenia can be used as a marker of prognosis [16].

Conclusion

This study showed a variable range of presentation. Asymptomatic patients during disease despite being Covid-19 positive pose a great epidemiological risk to society as they can spread the infection unrestrictedly and shall be strictly isolated. Old age and comorbidity are associated with poor prognosis. The study provides further insights into the burden of COVID-19 infection among HCWs, the epidemiology and guides us to evaluate and further plan our preventive measures and management strategies.

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