ORIGINAL RESEARCH PAPER

General Medicine

EPIDEMIOLOGY AND CLINICAL FEATURES OF 690 PATIENTS WITH COVID 19 IN CHENNAI, TAMILNADU

KEY WORDS: COVID 19, SARS CoV-2, Pneumonia, Clinical features, Epidemiology, Chennai

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ABSTRACT

BACKGROUND & OBJECTIVE: Chennai city in Tamilnadu served as an initial epicentre for SARS CoV-2 pandemic in Tamilnadu, India. We report the epidemiological, clinical, laboratory and radiological characteristics of these patients.

METHODS: All lab confirmed COVID 19 cases admitted in Government Kilpauk medical college and its quarantine centres in Chennai, Tamilnadu from 25th October to 5th November were included. The epidemiological data and clinical characteristics were collected. We evaluated individuals with and without severe disease (Defined as Admission to ICU)

RESULTS: Among 690 patients 290 were admitted in quarantine facility and 400 patients were hospitalized. Of the admitted patients 67% were males, 38% in 20 to 40 years 36% in 40 to 60 years, 43% had one or more comorbidities with Diabetes (40%), systemic hypertension (20%), Cardiovascular disease (5%) being more prevalent. Common symptoms included fever [376 – (54%)], cough [300 – (43%)], fatigue [152 – (22%)], breathlessness [150 – (21%)]. Hypoxia was noted in 16% of patients at admission. Lymphopenia noted in 30% of patients. Typical imaging findings of viral pneumonia is noted in 382 (55%) patients. Severe disease occurred in 14% of patients and 11% patients were placed on mechanical ventilation.

CONCLUSION: From the demographic profile, most of the patients are in the age group of 20-40 years. About two thirds of the patients are male and patients with comorbidities have shown significantly elevated risk of acquiring COVID 19 infection. Diabetes mellitus, a common comorbid condition was found to have a significant impact on developing severe disease. The mortality in ICU patients was high.

INTRODUCTION:

In December 2019 an outbreak of new pneumonia cases of unknown aetiology emerged in Wuhan, China and has disseminated worldwide. First confirmed case in India was reported in the state of Kerala on 30th January 2020 (A Student who was studying in China, Wuhan University). Tamilnadu reported its first case on 7th March 2020. Greater peaks were observed during the month of August and September.

Initially thought to be a zoonotic infection which was then nullified by considerable evidence confirming human to human transmission. The infective agent isolated from the patients showed an emergence of novel RNA beta corona virus which was officially named SARS CoV-2 by WHO on 11th February 2020. The disease caused by SARS CoV-2 was officially named Corona virus disease 2019 (COVID-19) by WHO.

The clinical presentation ranges from mild to critical scenarios with common features including fever, cough, fatigue & breathlessness. Other features include sore throat, running nose, headache, loose stools, vomiting, anosmia, loss of taste, abdominal pain & chest pain.

ARDS, acute cardiac injury, acute kidney injury, thrombo-embolism, shock & death were reported in severe cases. Early reports indicate that infection occurs in clusters within groups in close contacts and severe disease more common in elderly with comorbidities.

In this case series we examine epidemiology, clinical features of 690 patients from a tertiary care centre and quarantine facility in Chennai, Tamilnadu.

METHODS:

STUDY DESIGN AND PARTICIPANTS:

We conducted a cross sectional study examining the clinical characteristics of patients with lab confirmed SARS CoV-2 infection. Patients included are In-patients in Government Kilpauk Medical College and its affiliated quarantine centres between 25th September and 5th October.

DATA SOURCES AND COLLECTION:

Demographic data, encounter data, laboratory measurements, radiological studies, vital signs, medications were collected from the hospital records and documented in a prestructured proforma and statistical analysis was done.

RESULTS:

690 patients with lab confirmed SARS CoV-2 infection were hospitalized between 25th September and 5th October. Among them 461 (67%) were males, 229 (33%) were females, with 6% (42) in age group <20 years, 38% (265) in 20-40 years, 37% (254) in 40-60 years and 19% (129) in >60 years. Among 690 patients 43% (300) had 1 or more coexisting medical disorders, 40% (279) had diabetes mellitus, 20% (139) systemic hypertension, 5% (37) cardiovascular disease, 2% (16) COPD.

Common clinical features were fever [376 – (54%)], cough [300 – (43%)], fatigue [152 – (22%)], breathlessness [150 – (21%)], other features include sore throat (16%), running nose (16%), headache (14%), loose stools (12%), vomiting (10%), loss of smell (11%), loss of taste (8%), chest pain (2%) and 25% (173) patients were asymptomatic. Hypoxia was observed in 16% of patients on admission.

Demographic And Clinical Characteristics Of Patients Infected With SARS CoV-2

	ALL PATIENTS N=690	NON-SEVERE N=531	SEVERE N=159
Age			
0-20	39 (5%)	38 (7%)	1 (0.6%)
20-40	267 (39%)	244 (46%)	23 (14.4%)
40-60	254 (37%)	184 (35%)	70 (44%)
>60	130 (19%)	64 (12%)	66 (41%)
Sex			
Male	461 (67%)	356 (67%)	105 (66%)
Female	229 (33%)	175 (33%)	54 (34%)
Comorbidity			
Diabetes mellitus	279 (40%)	158 (30%)	121 (76%)
Systemic hypertension	139 (20%)	59 (11%)	80 (50%)
Cardiovascular disease	37 (5%)	11 (2%)	26 (16%)
COPD	16 (2%)	4 (0.7%)	12 (7%)
Comorbidity burden			
None	381 (55%)	352 (66.4%)	29 (18%)
1-2	280 (41%)	178 (33.5%)	102 (64%)
3 or more	29 (4%)	1 (0.1%)	28 (18%)
Smoking	165 (30%)	105 (20%)	60 (38%)
Symptoms			
Fever	376 (54%)	250 (47%)	126 (79%)
Cough	300 (43%)	192 (36%)	108 (68%)
Breathlessness	156 (23%)	34 (6%)	122 (77%)
Fatigue	152 (22%)	110 (21%)	42 (26%)
Sore throat	114 (16%)	80 (15%)	34 (21%)
Running nose	114 (16%)	91 (17%)	23 (14%)
Loose stools	86 (12%)	56 (10%)	30 (19%)
Headache	99 (14%)	70 (13%)	29 (18%)
Vomiting	69 (10%)	45 (8%)	24 (15%)
Loss of smell	74 (11%)	54 (10%)	20 (13%)
Loss of taste	58 (8%)	40 (7%)	18 (11%)
Asymptomatic	173 (25%)	160 (30%)	13 (8%)

Vital Signs, Imaging And Laboratory Measurements Of Patients Infected With SARS CoV-2

	ALL PATIENTS N=690	NON-SEVERE N=531	SEVERE N=159
Saturation			
>92%	593 (86%)	515 (97%)	78 (49%)
80-92%	85 (12%)	16 (3%)	69 (44%)
70-80%	8 (1%)	0	8 (5%)
<70%	4 (0.5%)	0	4 (2%)
Pulse rate (bpm)			
>120	19 (3%)	8 (1.5%)	11 (7%)
100-120	210 (30.3%)	114 (21%)	96 (60%)
60-100	456 (66%)	407 (76%)	49 (31%)
<60	5 (0.7%)	2 (0.3%)	3 (1.8%)
Blood pressure (mmHg)			
>160/100	10 (1.4%)	4 (0.7%)	6 (3.7%)
140/90-160/100	40 (5.7%)	19 (3.5%)	21 (13%)
100/60-140/90	637 (92%)	508 (95%)	129 (81%)
<100/60	3 (0.4%)	0	3 (1.8%)
Respiratory rate (cpm)			
>30	15	0	15 (9.4%)
25-30	64	10	54 (33%)
20-25	187	124	63 (39%)
<20	417	390	27 (16%)
Imaging (CT-CHEST)			
No lung involvement	211 (31%)	202 (38%)	8 (5%)
1-25 %	243 (35%)	214 (40%)	29 (18%)
25-50%	82 (12%)	23 (4%)	59 (38%)
50-75%	51 (7%)	1 (0.1%)	50 (31%)
>75%	13 (2%)	0	13 (8%)
Neutrophil lymphocyte ratio (NLR)			
1-6	541 (78%)	507 (95%)	34 (21%)
6-9	56 (8%)	11 (2%)	45 (28%)
9-18	67 (10%)	10 (1.5%)	57 (36%)
>18	26 (4%)	3 (0.5%)	23 (15%)

Complications And Treatment

	ALL PATIENTS N = 690	NON-SEVERE N = 531	SEVERE N = 159
Complications			
ARDS	35 (5%)	2 (0.37%)	33 (20%)
AKI	18 (2.6%)	2 (0.37%)	16 (10%)
Acute cardiac injury	23 (3.3%)	3 (0.56%)	20 (12.5%)
Shock	6 (0.8%)	0	6 (3.7%)
Treatment			
Antiviral	257 (37%)	98 (18.4%)	159 (100%)
Antibiotic	259 (37.5%)	100 (18.8%)	159 (100%)
Corticosteroid	299 (43%)	140 (26%)	159 (100%)
LMWH	299 (43%)	140 (26%)	159 (100%)
Oxygen support			
NRM or HFNO	120 (17%)	40 (7.5%)	80 (50%)
Non-invasive ventilation (Bi/CPAP)	76 (11%)	5 (0.9%)	71 (45%)
Invasive ventilation	8 (1.1%)	0	8 (5%)
Death	18 (2.6%)	1 (0.1%)	17 (10.6%)

On admission then degree of severity of COVID 19 was categorised as non-severe in 531 (77%) patients and severe in 159 (23%). Patients with severe disease were older than those with non-severe disease, co-existing illness was more common among patients with severe disease than among those with non-severe disease. Most of the patients with severe disease had lymphocytopenia (78%). CT chest was taken in 600 patients, abnormality was noted in 65% of patients. About 17% of patients required oxygen supplementation, and 12% required mechanical ventilation. Death occurred in 18 (2.6%) patients enrolled in the study which indicates a low mortality rate. Mortality rate in ICU patients was 10.6%.

DISCUSSION:

In our study, which enrolled 690 individuals with SARS CoV-2 between 25th October and 5th November showed us male predominance with male: female ratio 2:1, which is consistent with reports, but there was no variation in severity. Age group most commonly involved were middle aged group (20-60 years) constituting 75%. Diabetes was the most prevalent comorbidity followed by hypertension and heart disease.

About 25% of patients were asymptomatic at the time of admission, who were traced out by close contacts with infected cases. This may be attributable to long latency of SARS CoV-2 or strong immunity of these individuals. Most predominant symptoms among patients infected with SARS CoV-2 were fever, cough, breathlessness, fatigue which were similar to SARS CoV and MERS CoV. Other symptoms like loose stools, vomiting, abdominal pain, and headache were present but less common. Patients with hypoxia in initial presentation mostly had severe disease.

From the study it is evident that all age groups were susceptible to the virus and most of the critical ill cases with many complications requiring ICU admissions were elderly patients with comorbidities. Severe illness occurred in 159 (23%) patients, out of them 85% of individuals were more than 40 years, 82% had one or more comorbidities. The disease usually occurs in clusters and its infectivity is very much high resulting such a major outbreak. Main transmission routes were droplet infection and aerosols occurring as human to human transmission.

The chest computed tomography findings were also similar to that of SARS CoV and MERS CoV showing bilateral ground glass opacities and patchy shadows. No radiological abnormalities were noted in initial presentation in 5% of patients with severe disease and 38% with non-severe disease. The neutrophil lymphocyte ration (NLR) was elevated in almost 80% of patients with severe disease indicating severe lymphocytopenia thus it can be used as an indicator for grading severity. Patients with severe disease received corticosteroids, low molecular weight heparin, antivirals and antibiotics. 17% of patients required oxygen supplementation and 12% required mechanical ventilation. Death occurred in 18 (2.6%) patients enrolled in the study which indicates a low mortality rate. Mortality rate in ICU patients was 10.6%.

Most of the patients with severe disease had multi-system involvement such as acute kidney injury, acute cardiac injury, thrombo-embolic events, uncontrolled sugars suggesting that COVID 19 is a multi-system disease with an obscure pathophysiology which warrants more research and exploration into this topic.

There are some notable limitations in our study. First, as this is an observational study where clinical data were collected routinely, incomplete capture of data. Since study period is short, most of patients were not followed-up after study period. The study also included many asymptomatic patients. Study population only included patients within one tertiary hospital of Chennai region.

CONCLUSION:

From this data series, the main findings are elderly age group with comorbidities are prone to develop severe disease. Lymphocytopenia is most commonly associated with severe COVID 19. The mortality in ICU patients was high.

From the demographic profile, most of the patients are in the age group of 20-40 years. About two thirds of the patients are male and patients with comorbidities have shown significantly elevated risk of acquiring covid infection. Diabetes mellitus, a common comorbid condition was found to have a significant impact on developing severe disease.

From the laboratory evidence, patients with high NLR ratio (Severe Lymphocytopenia) are most commonly associated with severe disease. Patients with high CT scoring require ICU monitoring and mortality is high in such patients.

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