



Clinical Features and Outcome of COVID-19 Patients during First Wave of Covid-19 Pandemic- A Case Series

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ABSTRACT

Objective: To describe the clinical features and outcomes of patients with COVID-19 admitted during the first wave Covid-19 Pandemic in Tomo Riba Institute of Health and Medical Sciences (TRIHMS), Dedicated Covid Hospital (DCH), Chimpu, Itanagar, Arunachal Pradesh. **Methods:** A Prospective study of patients with COVID-19 admitted to TRIHMS Dedicated Covid Hospital. Chimpu. The study included all sequentially admitted patients between 1st June 2020, and 30th November 2020. **Results:** A total of 462 patients were admitted. Male-266 Female-196. Males constituted the majority of the patients in this study which accounted for 57.5%. The age distribution of the patients was 0 to 20=37.21 to 40=163.41 to 60=218.61 to 80=44. Most of the patients admitted to the DCH Chimpu were from Itanagar Capital Region (78.7%) followed by Papumpare (3.2%), West Kameng (2.5), and Upper Subansiri (2.3 %) The most common comorbidity in our observation was Diabetes Mellitus (18.8%) and Hypertension

(18.6%). Oxygen saturation below (SpO_2) 94% and respiratory rate of more than 24 breaths per minute were the most common findings during the admission. The main common presenting symptoms were shortness of breath (73.59%) and dry irritating cough (62.33%). Out of the total admitted patients, 154 needed ICU care (33.33%). Seven patients (1.51%) were put on a mechanical ventilator. Ten patients (2.16%) had received hemodialysis. Two patients were given Convalescent Plasma Therapy (CPT). The recovery rate was 91.99%. The overall mortality rate recorded was 5.62%. Chronic Kidney Disease was the most common comorbidity seen in the expired patients, followed by Cardiovascular Disease (5), Chronic Liver Diseases (3), Cancer (3), and Diabetes Mellitus (3). **Conclusions:** This study was done to identify the pattern of clinical features and outcomes of admitted patients with COVID-19 during the first wave Covid-19 Pandemic in the Itanagar Capital Region (ICR) and adjoining districts of Arunachal Pradesh.

Keywords: Covid-19, Pandemic, Chronic kidney disease, Diabetes mellitus, Hypertension

INTRODUCTION

Coronaviruses belong to the Coronaviridae family in the Nidovirales order. Corona represents crown-like spikes on the outer surface of the virus; thus, it was named a coronavirus. Coronaviruses are minute in size (65 nm to 125 nm in diameter) and contain a single-stranded RNA as a nucleic material, with sizes ranging from 26 kbs to 32 kbs in length. The subgroups of the coronaviruses family are Alpha (α), Beta (β), Gamma (γ), and Delta (δ) coronavirus. The SARS-CoV-2 novel coronavirus was identified in Wuhan, Hubei province of China in December 2019 by the Chinese Center for Disease and Prevention from the throat swab of a patient the virus is named severe acute respiratory distress COV-2 by WHO which causes Coronaviruses disease 2019 (COVID-19) [1,2]. Severe acute respiratory syndrome (*SARS-CoV-2*) belongs to a group of viruses that cause Coronavirus disease 2019 (COVID-19) which affects the respiratory, gastrointestinal, liver, and central nervous systems of humans, livestock, Bats, mice, and another wild animal [1-4]. The infection mainly affects the respiratory system and presented with fever, dry cough, and difficulty breathing lately the patient may die due to pneumonia and acute respiratory distress syndrome [5-12].

Angiotensin-Converting Enzyme 2 (ACE2) is a protein found on the surface of lung alveolar epithelial cells and enterocytes of the small intestine, which has been proposed as the entry site for *SARS-CoV-2*. *ACE2* breaks down angiotensin II, a pro-inflammatory factor in the lung. Inhibition of *ACE2* may be another factor in lung injury, as well as the cause of systemic inflammation with cytokine release that can result in Acute Respiratory Distress Syndrome (ARDS) and multiorgan dysfunction. Disruption in immune system regulation increased metabolic demand and procoagulant activity likely accounts for some of the increased risk of adverse outcomes in those with COVID-19-related Cardiovascular Disease (CVD). Specifically, systemic inflammation can destabilize vascular plaques, while viral illness increases cytokine activity, increasing cardiac demand, similar to influenza. Recent research, however, has suggested that the virus may also cause direct damage to the heart by utilizing *ACE2* receptors located within the cardiac tissue.

The first confirmed case of coronavirus disease 2019 (COVID-19) in Arunachal Pradesh was reported from Tezu, Lohit District on 24th March 2020. Soon after, many districts reported cases of Covid-19. The rate of infection

in the Itanagar Capital Region, with its high population density, exceeded every other district of Arunachal Pradesh. Limited information was available to describe the presenting characteristics and outcomes of patients requiring hospitalization with this illness in the state of Arunachal Pradesh. This study describes the baseline comorbidities, presenting clinical signs and symptoms, and outcomes of the first wave of hospitalized patients with COVID-19 in the Itanagar Capital Region, Arunachal Pradesh.

METHODS

Aims and Objects

To describe the clinical features and outcomes of patients with COVID-19 admitted during the first wave Covid-19 Pandemic in Tomo Riba Institute of Health and Medical Sciences (TRIHMS), Dedicated Covid Hospital (DCH), Chimpu, Itanagar, Arunachal Pradesh.

Materials and Methods

The study was conducted at TRIHMS Dedicated Covid Hospital Chimpu.Itanagar.This is a prospective observational study of the admitted patients starting from 1st June 2020 to 30th November 2020. All consecutive patients having moderate to severe symptoms that required hospital admission with confirmed Severe Acute Respiratory Syndrome Coronavirus 2 (*SARS-CoV-2*) infection by a positive result on RT-PCR/RAT/Truenaat testing of a nasopharyngeal sample were included. Data collected included baseline comorbidities, presenting signs and symptoms, treatments (including invasive mechanical ventilation and Hemodialysis), and outcomes (discharge, readmission, and mortality). The patients admitted were subjected to gross general physical and clinical examinations. Detailed histories regarding the nature of symptoms like breathlessness, Fever, Cough, Sputum production, Wheezing, Chest tightness, Body ache, etc. were obtained. History of allergies, history of smoking, history of alcoholism, and history of illnesses like Hypertension, Diabetes Mellitus, Cancer, HIV status, Kidney ailments, and autoimmune diseases was also noted. Height, weight, and vital signs including SPO₂, blood pressure, pulse rate, respiratory rate, and temperature were measured. Chest x-ray and ECG were taken. Routine blood tests were done.

RESULTS

The results of this study are as follows:

Table 1 Age distribution of the admitted patients

| Age in years | Number | Percentage |
|--------------|-----------|------------|
| 00-20 | 37 | 8% |
| 21-40 | 163 | 35.3% |
| 41-60 | 218 | 47.1% |
| >60 | 44 | 9.5% |
| Total | 462 | 100% |
| Mean ± SD | 35 ± 1.24 | |

The majority of the patients were aged 41 years to 60 years which accounted for 47.1%. The mean age was 55 years with a standard deviation of 1.24 years (Table 1).

Table 2 Sex distribution of the admitted patients

| Sex | Number | Percentage |
|--------|--------|------------|
| Male | 266 | 57.5% |
| Female | 196 | 42.5% |
| Total | 462 | 100% |

Males constituted the majority of the patients in this study which accounted for 57.5% of the cases as shown in Table 2.

Table 3 Distribution of the patients by address/districts

| Address | Number | Percentage |
|-------------------------|--------|------------|
| Itanagar Capital Region | 364 | 78.7% |
| Papumpare | 15 | 3.2% |
| West Kameng | 12 | 2.5% |
| Upper Subansiri | 11 | 2.3% |
| West Siang | 10 | 2.1% |
| East Kameng | 8 | 1.7% |
| Lower Subansiri | 7 | 1.5% |
| East Siang | 6 | 1.2% |
| Tawang | 5 | 1.08% |
| Upper Siang | 5 | 1.08% |
| Lower Siang | 3 | 0.6% |
| Kamle | 3 | 0.6% |
| Namsai | 4 | 0.8% |
| Shi Yomi | 2 | 0.4% |
| Changlang | 2 | 0.4% |
| Tirap | 2 | 0.4% |
| Lepa Rada | 3 | 0.6% |
| Total | 462 | 100% |

Most of the patients admitted to the DCH Chimpu were from Itanagar Capital Region (78.7%) followed by Papumpare (3.2%), West Kameng (2.5%), and Upper Subansiri (2.3 %) as shown in Table 3.

Table 4 Associated comorbidities of the patients

| Comorbidities | Number | Percentage |
|------------------------|--------|------------|
| Diabetes Mellitus | 87 | 18.8% |
| Hypertension | 86 | 18.6% |
| Pregnancy | 35 | 7.5% |
| Chronic Lung Diseases | 16 | 3.4% |
| Chronic Kidney Disease | 12 | 2.5% |

| | | |
|------------------------|-----|--------|
| Depression | 12 | 2.5% |
| Alcoholism | 8 | 1.7% |
| Carcinoma | 10 | 2.16% |
| Chronic Liver disease | 9 | 1.9% |
| Cardiovascular Disease | 10 | 2.16% |
| Tuberculosis | 5 | 1.08% |
| Anemia | 10 | 2.16% |
| Post-surgery Cases | 5 | 1.08% |
| Fractures | 3 | 0.64% |
| Renal Stone | 3 | 0.64% |
| GB Syndrome | 1 | 0.21% |
| No Comorbidities | 150 | 32.46% |
| Total | 462 | 100% |

The most common comorbidity in our observation was Diabetes Mellitus (18.8%) and Hypertension (18.6%) followed by Pregnancy (7.5%), Chronic Lung Diseases (3.4%), Chronic Kidney Disease (2.5%), Depression (2.5%) and Cancer (2.16%). Out of 443 patients that were admitted to DCH, Chimpu, 150 patients had no comorbidities (32.46%) (Table 4).

Table 5 Presenting vitals

| Vitals | Number | Percentage |
|---------------------------|--------|------------|
| Temp >38°C | 204 | 44.15% |
| Oxygen Saturation <90% | 114 | 24.67% |
| Oxygen Saturation >90 | 340 | 73.59% |
| Respiratory Rate >30/min | 160 | 34.63% |
| Respiratory Rate >40 /min | 228 | 49.35% |
| Heart Rate >100/min | 200 | 43.29% |
| BP <90/60 mmHg | 102 | 22.07% |
| Normal Vitals | 154 | 33.33% |

Oxygen saturation below (SPO₂) 94% and respiratory rate of more than 24 breath per minute was the most common findings during the admission as shown in Table 5.

Table 6 Presenting symptoms

| Presenting symptoms | Number | Percentage |
|---------------------|--------|------------|
| Cough | 288 | 62.33% |
| Fever | 204 | 44.15% |
| Shortness of breath | 340 | 73.59% |
| Myalgia | 120 | 25.97% |
| Anosmia | 97 | 20.99% |
| Diarrhea | 68 | 14.71% |
| Sore throat | 76 | 16.45% |
| Asymptomatic | 112 | 24.24% |

The most common presenting symptoms were shortness of breath (73.59%) and dry irritating cough (62.33%). Anosmia was seen in 20.99% of admitted patients. 112 patients admitted to DCH Chimpu had no respiratory symptoms but were admitted for some non-specific complaints (24.24%) (Table 6).

Table 7 Clinical measures of admitted patients

| Clinical Measures | Number | Percentage |
|-----------------------------|--------|------------|
| General Ward Care | 253 | 54.76% |
| ICU Care | 154 | 33.33% |
| HFNO | 24 | 5.19% |
| Non-Invasive Ventilation | 12 | 2.59% |
| Invasive Ventilation | 7 | 1.51% |
| Hemodialysis | 10 | 2.16% |
| Convalescent Plasma Therapy | 2 | 0.43% |
| Total | 462 | 100% |

Out of the total admitted patients, 154 needed ICU care (33.33%). Twenty four patients (5.19%) received High Flow Nasal Oxygenation (HFNO). Seven patients (1.51%) were put on a mechanical ventilator. Ten patients (2.16%) had received hemodialysis. Two patients were given Convalescent Plasma Therapy (CPT) (Table 7).

Table 8 Outcome of admitted patients

| Outcome | Number | Percentage |
|---------------------------|--------|------------|
| Recovered and Discharged | 425 | 91.99% |
| Died | 26 | 5.62% |
| Referral to Higher Centre | 5 | 1.08% |
| Re-admission | 6 | 1.29% |
| Total | 462 | 100% |

425 patients were treated and discharged from the hospital. The recovery rate was 91.99%. The overall mortality rate recorded was 5.62%. Six patients needed re-admission to the hospital. Five patients were referred outside the state for super specialty care (Table 8).

Table 9 Comorbidities of expired patients

| Comorbidities | Number |
|------------------------|--------|
| Chronic Kidney Disease | 5 |
| Cardiovascular Disease | 5 |
| Chronic Liver Disease | 3 |
| Cancer | 3 |
| Diabetes Mellitus | 3 |
| Chronic Lung Disease | 1 |
| Post Surgery | 2 |
| Anemia | 1 |
| No Comorbidities | 3 |
| Total | 26 |

Chronic Kidney Disease was the most common comorbidity seen in the expired patients, followed by Cardiovascular Disease (5), Chronic Liver Diseases (3), Cancer (3), and Diabetes Mellitus (3) (Table 9).

DISCUSSION

To our knowledge, this study represents the first case series of sequentially hospitalized patients with confirmed COVID-19 in our state of Arunachal Pradesh. Males constituted the majority of the patients in this study which accounted for 57.5% of the cases as shown in Table 2. The majority of the patients were in the age group of 41 years to 60 years which accounted for 47.1%.

Most of the patients admitted to the DCH Chimpu were from Itanagar Capital Region (78.7%) followed by Papumpare (3.2%), West Kameng (2.5%), and Upper Subansiri (2.3%) as shown in Table 3. The most common comorbidities in our observation are Diabetes Mellitus (18.8%) and Hypertension (18.6%) followed by Pregnancy (7.5%), Chronic Lung Diseases (3.4%), Chronic Kidney Disease (2.5%), Depression (2.5%) and Cancer (2.16%). Older persons, men, and those with pre-existing hypertension and/or diabetes were highly prevalent in this case series and the pattern was similar to data reported from China [13]. Oxygen saturation below (SPO₂) 94% and respiratory rate of more than 24 breaths per minute were the most common findings during the admission. The main common presenting symptoms were shortness of breath (73.59%) and dry irritating cough (62.33%). Anosmia was seen in 20.99% of admitted patients. 112 patients admitted in DCH Chimpu had no Covid symptoms but were admitted for some non-covid complaints (24.24%). Out of the total admitted patients, 154 need ICU care (33.33%). Seven patients (1.51%) were put on a mechanical ventilator. Ten patients (2.16%) had received hemodialysis. Two patients were given Convalescent Plasma Therapy (CPT). Out of seven patients that were put on mechanical ventilation, two patients were weaned off successfully and five patients expired (71.4%). In mechanically ventilated patients, mortality has ranged from 50%-97%. Cohorts in New York have shown a mortality rate in the mechanically ventilated population as high as 88.1% [14]. 425 patients were treated and discharged from the hospital. The recovery rate was 91.99%. The overall mortality rate recorded was 5.62%. Chronic Kidney Disease was the most common comorbidity seen in the expired patients, followed by Cardiovascular Disease (5), Chronic Liver Diseases (3), Cancer (3), and Diabetes Mellitus (3).

This was an observational study conducted at a single healthcare system in a confined geographic area thus limiting the generalizability of our results.

CONCLUSION

This study is the first and the largest in the state of Arunachal Pradesh. This study was done to study the clinical features and outcome of Novel Coronavirus among apparently healthy individuals and patients with comorbid conditions admitted during the first wave of the Covid-19 Pandemic with confirmed COVID-19 in the Itanagar Capital Region (ICR) and adjoining districts of Arunachal Pradesh.

DECLARATIONS

DECLARATIONS**Conflict of Interest**

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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