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Chapter 5

Treatment Approaches in Covid-19 Management:Prescribing Pattern and Outcome

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Abstract

There were various treatment approaches for the management of COVID-19, but initially, due to a lack of available information and a lack of drug availability, various drugs were prescribed to the patient. A huge difference in the first and second wave was seen. Therefore, this study is carried out to review the prescribing pattern and clinical outcome of different treatment approaches involved in COVID-19 management. A retrospective study was conducted on COVID-19-positive patients admitted to the hospital. Demographic details, presenting complaints, and diagnosis were recorded in CRF. The drug prescribing pattern was evaluated. Total 293 patients were admitted to the hospital. Out of 78 patients in 1^{st} wave, 51(65%) patients had mild, 26(34%) had moderate, and 1(1%) had severe Covid-19 infection with no mortality. The mean age of patients was 45.3 ± 18.071 years. Common drugs prescribed during 1^{st} wave were anti-pyretic, multivitamins, anti-inflammatory, anticoagulants, and glucocorticoids/steroids. The Mean age of patients was 53.7 ± 15.9 years. Prescribed drugs included analgesics, NSAIDS, antibiotics, immunomodulators, anticoagulants, steroids, vitamin supplements, PPIs, antihistamines, antivirals, probiotics, antiemetics, and laxatives. During the 1^{st} and 2^{nd} wave medicines were given according to standard treatment guidelines. Additionally, supportive and symptomatic therapy was prescribed as per patient's comorbidities.

Keywords: Coronaviruses, Supportive and symptomatic therapy, Middle East Respiratory Syndrome, Severe Acute Respiratory Syndrome.

1. Introduction

Coronaviruses are a broad family of viruses that can cause everything from a normal cold to more serious illnesses like Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) [1]. It was discovered in Wuhan, China, in December 2019. It is highly contagious and has spread rapidly all over the world [2].

The COVID-19 pandemic has spread rapidly over the world, resulting in more than 532,201,219 cases and 6,305,358 deaths [3]. In terms of structure, SARS CoV2 consists of a single strand of RNA, of which two thirds are found in an open reading frame (ORF), which also comprises polyproteins and non-structural proteins for the viral life cycle [4, 5].

Things started slowly from an Indian perspective; the first cases appeared in February 2020. The lockdown had disadvantages, but it did contribute to some degree of illness control in the prospect of some virus-fighting medications. During the beginning of the covid outbreak in India, hydroxychloroquine, azithromycin, favipiravir, and ivermectin were being prescribed as treatments [6].

A typical COVID-19 prescription contains drugs of various classes like azithromycin, doxycycline, ivermectin, hydroxychloroquine, vitamin C, vitamin D, zinc, acetylcysteine, and budesonide inhalation or dexamethasone [6]. Combating the COVID-19 pandemic is a top priority for pharmaceutical and medical research. The current authorised or recommended COVID-19 vaccinations offer the best chance of preventing a severe case of coronavirus disease, even though treatment may shorten COVID-19 infection in affected individuals. Booster shots and additional doses of the COVID-19 vaccination are offered and advised for people who have already had it [7].

Since COVID-19 can be managed with a variety of medications, there is little evidence of clinical outcome in terms of safety and efficacy for all of the drug therapy options now in use. Therefore, the goal of the current study was to assess various treatment modalities for managing COVID infections of varying severity and to interpret the course of therapy and outcome.

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An observational retrospective study was carried out in all patients with positive Covid test admitted to CHARUSAT Hospital during the time period from March 2020 to July 2021 for 1^{st} and 2^{nd} wave of COVID-19. A total of 293 patient files were included for the duration of March 2020 to January 2022.

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of CHARUSAT (no. CHA/IEC/ADM/21/09/1298) on September 28, 2021 with the need for written informed consent waived.

Each patient's relevant details, like demographic details, socioeconomic details, medical and medication history, prescribed drugs, severity of the infection, signs, and symptoms, were recorded in a case record form. Severity of infection was classified based on High-Resolution Computed Tomography (HRCT) score. According to the severity, the patient's treatment chart was observed, and accordingly, the prescribing trend was reviewed.

2. Clinical Outcome

In the 1^{st} wave of COVID-19, a total of 78 patients with positive COVID tests were admitted to the hospital. Out of 78 patients, 42 (54%) male and 36 (46%) male patients were admitted. The age range of patients in the 1^{st} wave was from 7 to 90 years, with a mean age of 45.32 years. Out of 78 patients in 1^{st} wave of COVID-19, 36 patients had comorbidities, where 24 were male and 12 were female patients.

The severity of the infection was classified as mild, moderate, and severe. Furthermore, there were no mortalities recorded in the inpatient department of CHARUSAT hospital; 100% recovery was recorded Table 1.

Table 1: Demographic details of Covid-19 patients

Characteristic	**1^{st} wave**		**2^{nd} wave**	
Gender	**Number of Patients n (%)**		Number of Patients n (%)	
Male	42 (53.84%)		129 (60%)	
Female	36 (46.15%)		86 (40%)	
Age range(years)				
1-20	7 (8.97%)		6 (2.79%)	
21-40	26 (33.33%)		42 (19.53%)	
41-60	29 (37.17%)		99 (46.04%)	
61-80	15 (19.2%)		56 (26.04%)	
81-100	1 (1.28%)		12 (5.58%)	
Patients with comorbidities	**Number of Male**	**Number of Female**	**Number of Male**	**Number of Female**
Diabetes	7	1	28	31
Hypertension	13	7	36	26
Hypothyroidism	1	4	3	5
Hyperthyroidism	1	-	2	-
Epilepsy	1	-	1	-
Hypotension	1	-	-	-
Epilepsy	-	-	1	-
COPD	-	-	1	0
IHD	-	-	3	1
Total	**24**	**12**	**74**	**63**
Severity grade				
Mild	51 (65.38%)		59 (27%)	
Moderate	26 (33.33%)		128 (60%)	
Severe	01 (1.28%)		28 (13%)	

In 2^{nd} wave of COVID-19, a total of 215 patients with positive COVID tests were admitted to the hospital. A total of 129 (60%) males and 86 (40%) females were admitted. The age range of patients in the 2^{nd} wave was from 15 to 94 years, with a mean age of 53.75 years. Moreover, 74 male and 63 female patients had comorbidities, which account for a total of 137 patients.

The majority of the patients—128 (60%)—had a moderate COVID-19 infection, followed by mild (59 (27%)) and severe (28 (13%)) COVID-19 infections Table 1.

Of 215 patients in 2^{nd} wave, there were 9 mortalities recorded in the inpatient department (IPD) of CHARUSAT hospital. A total 199 (92.55%) patients recovered and discharged. Only 03 (1.39%) patients Shifted to higher center for critical care.

For prescribed treatment to the patients, the prescription was evaluated according to the standard treatment Figure 3 and 4. It was observed that all the prescriptions were in accordance with the standard treatment guidelines provided by MoHFW (Version [6]).

Unprecedented levels of the global health care crisis have been brought on by the COVID-19 pandemic [8]. As soon as the Coronan Virus Disease 2019 (COVID-19) outbreak started, it quickly developed into a global public health emergency. Governments began combining their efforts to combat the threat [9]. COVID-19 was declared a pandemic by the World Health Organization (WHO) on March 11, 2020. [10] More than 153 million people had been affected by the 6^{th} of May 2021, with 3.2 million deaths reported [11]. A large percentage of infected patients who reported having mild to severe symptoms (cough, fever, and lung infiltrates) also exhibited symptoms that were indicative of bacterial pneumonia [8].

Most people do not require interferon therapy; however, it may be helpful in the early stages of the illness to enhance antiviral responses in the lungs. To prevent severe hypoxemia, which would require the use of supplemental oxygen, those with more severe illnesses need to be continuously watched [12]. Many antibiotics were prescribed during the pandemic, which may have an impact on how COVID-19 patients are treated and the ongoing fight against antimicrobial resistance (AMR) [8]. Antiviral medicines, antibiotics, antimalarials, immunosuppressants,

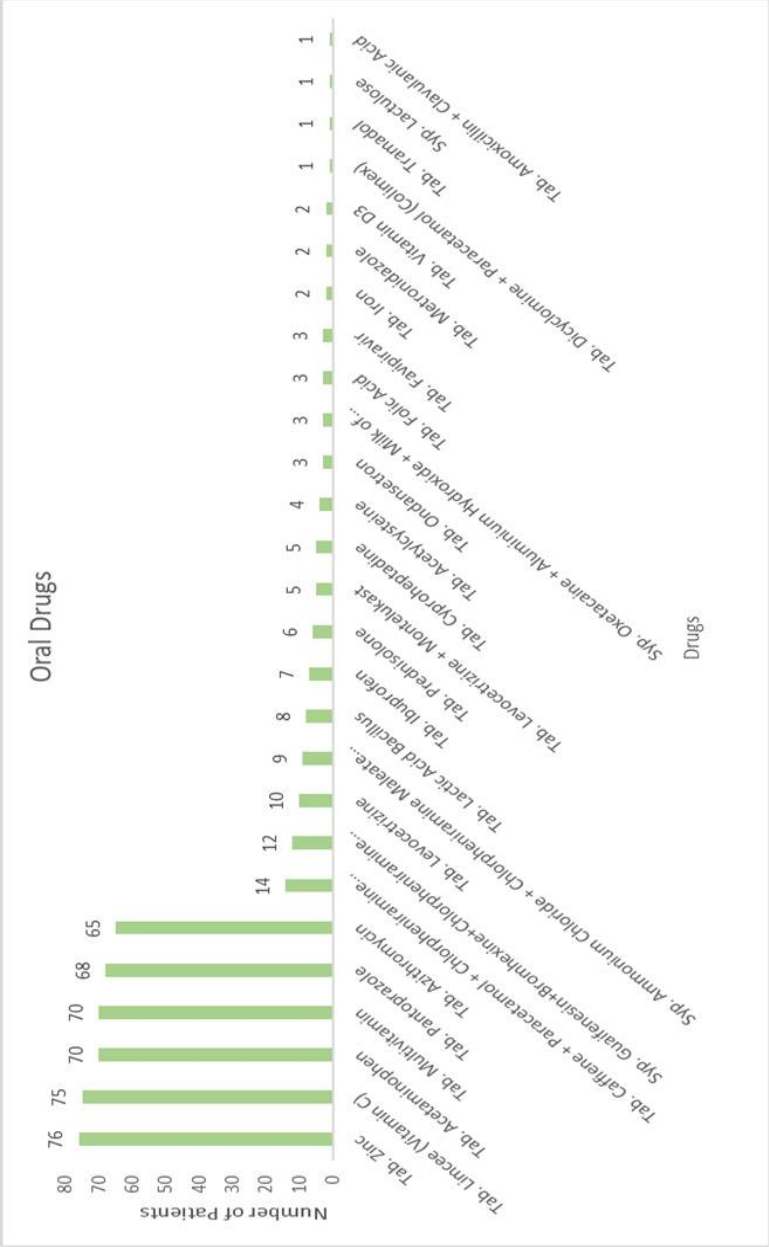

Figure 1: Oral Drugs prescribed to patients

immunomodulators, and corticosteroids, among other therapeutic treatments, have been chosen to assist reduce the mortality of mechanical ventilation, severe acute respiratory syndrome (SARS), and other damage wrought by COVID-19 [13].

Our study was conducted retrospectively, and the total study population was 293 patients that were further divided into 1st wave and 2nd wave. 1st wave had 78 patients, and 2nd wave had 215 patients. Of 293 patients, there were 171 (58.36%) males and 122 (41.63%) females. In the study [14], a tertiary care teaching hospital in Northern India also had a male population higher than female, that is, males were 34 (60.71%) and females were 22 (39.29%) [15]. Another study by [9] observed 134 (69.4%) males and 59 (30.6%) females with male dominance.

In present study, during 1st wave the mean age was found to be 45.3±18.07 years, ranging from 7 to 90 years. The majority of patients (21, 26.92%) were from the age group of 51 to 60 years. In 2nd wave, had patients of ages ranging from 15 to 94 years with a mean age of 53.75 ± 15.94. The majority of patients (59, 27.44%) were from the age group during during 2nd wave from 51 to 60 years. The study by [14] had reported majority of patients from the age group 40–60 years [8]. Whereas the study [15] had maximum patients in age group of 18 - 39 years, 3457 (40.2%) [13].

The most prominent comorbid condition in our study was found to be diabetes mellitus (60, 27.9%) and hypertension (79, 36.74%). Other comorbid conditions included hypothyroidism, ischemic heart disease, epilepsy, COPD, etc. The most common chronic co morbidity was arterial hypertension (n = 2785; 32.4 %), followed by diabetes mellitus (n = 1167; 13.6%), obstructive lung disease (n = 326; 3.8 %), chronic renal disease (n = 291;3.4 %), and dyslipidemia (n = 291; 3.4 %) [13].

The study identified the severity of the infection on the basis of symptoms during 1st wave and according to HRCT score during 2nd wave. So, in 1st wave 51 51(65%) patients had mild COVID, 26 (34%) had moderate, and 1 (1%) had severe COVID infection. During 2nd wave, 59 (27%) had mild, 128 (60%) had moderate, and 28 (13%) had severe COVID infection. The clinical outcome in the present study for both waves was a 100% recovery rate in 1st wave and 92.55% recovery during 2nd wave, with 9 mortalities recorded.

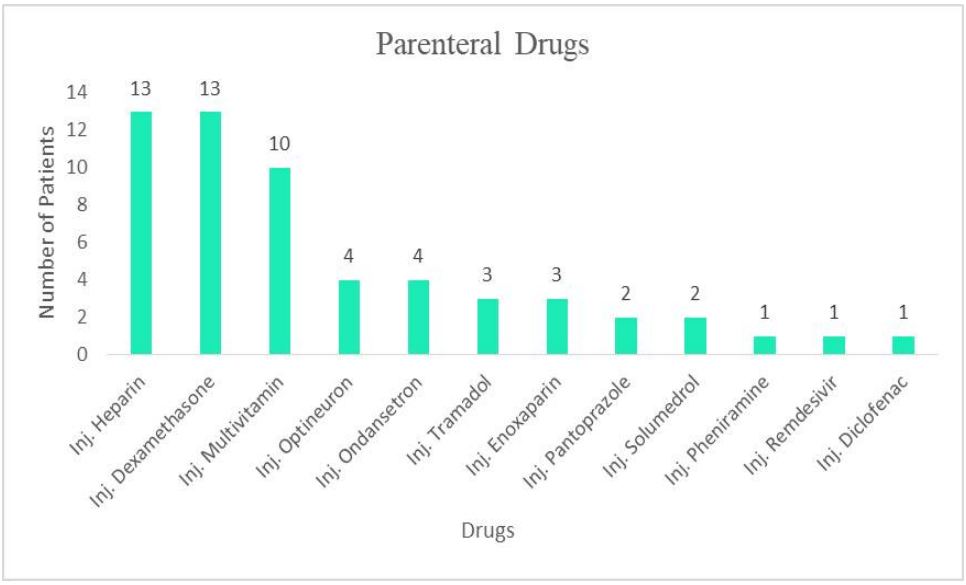

Figure 2: Parenteral Drugs prescribed to patients

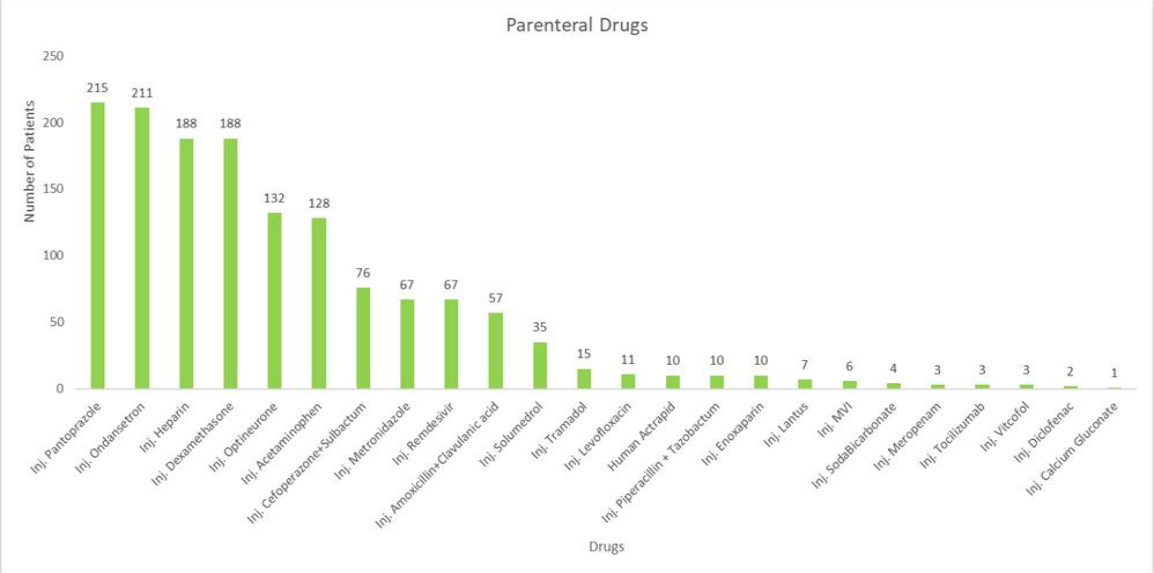

Figure 3: Parenteral Drugs prescribed to patients

The trend of prescribed drugs was identified, and the most common classes of drugs prescribed were antibiotics, steroids, anticoagulants, anti-tussives, analgesics, Non-steroidal Anti-inflammatory Drugs (NSAIDS), antipyretics, antacids, antiemetics, nutritional, vitamin supplements, bronchodilators, antivirals, antihistamines, hypoglycemics, and the other drugs prescribed were according to the symptoms of the patients. Of 78 patients in the 1^{st} wave, almost all patients were prescribed Tab. Zinc (100%), followed by vitamin supplements (99%), and antibiotics azithromycin (83.3%). The highest prescribing was of nutritional and vitamin supplements and antibiotics during the first wave. Taking into account the 2^{nd} wave, the most prescribed drug class in the parenteral category was anticoagulants (87.44%) and steroids (87.44%). In oral drugs, vitamin and nutritional supplements, followed by antipyretics, were the most commonly prescribed in almost every patient. According to the study [14], azithromycin (87.5%) was the most common prescribed antibiotic. Moreover, our study did not have any prescription with hydroxychloroquine; the study by [14]. Found hydroxychloroquine as frequently prescribed [15].

In the current study, different treatments were observed for different severity grades of infection. For 1^{st} wave, mild-severity infections had a prescription that included anti-pyretic/analgesics: paracetamol, diominic DCA, and Colimax (dicyclomine + PCM), NSAID: ibuprofen, vitamin and nutritional supplements, and antibiotics: azithromycin, metronidazole, and cefadroxil. Antitussives: Syp. Guaifenesin Bromhexine + Chlorpheniramine Maleate + Dextromethorphan Hydrobromide, Steroids: dexamethasone, prednisolone. The treatment was compared with the standard treatment guidelines provided by MoHFW (Ministry of Health and Family Welfare). The prescribing of antipyretics and immunomodulators was found according to the guidelines, whereas other medications were prescribed as per the patient's condition and need [16].

For moderate-severity treatment including anti-pyretics/analgesics Paracetamol and Diominic DCA, Glucocorticoid/Steroid: Dexamethasone, Methylprednisolone, and Prednisolone, Anticoagulants: heparin, enoxaparin, vitamins and nutritional supplements; antibiotics: azithromycin, metronidazole, amoxicillin, and clavulanic acid. Antitussives: Syp. Guaifenesin Bromhexine + Chlorpheniramine Maleate + Dextromethorphan Hydrobromide, Steroids: dexamethasone, prednisolone, and antiviral: favipiravir were found. according to MoHFW [16]. For severe conditions, drugs prescribed were glucocorticoid/steroid: dexamethasone, anticoagulants: heparin, anti-pyretics: paracetamol,

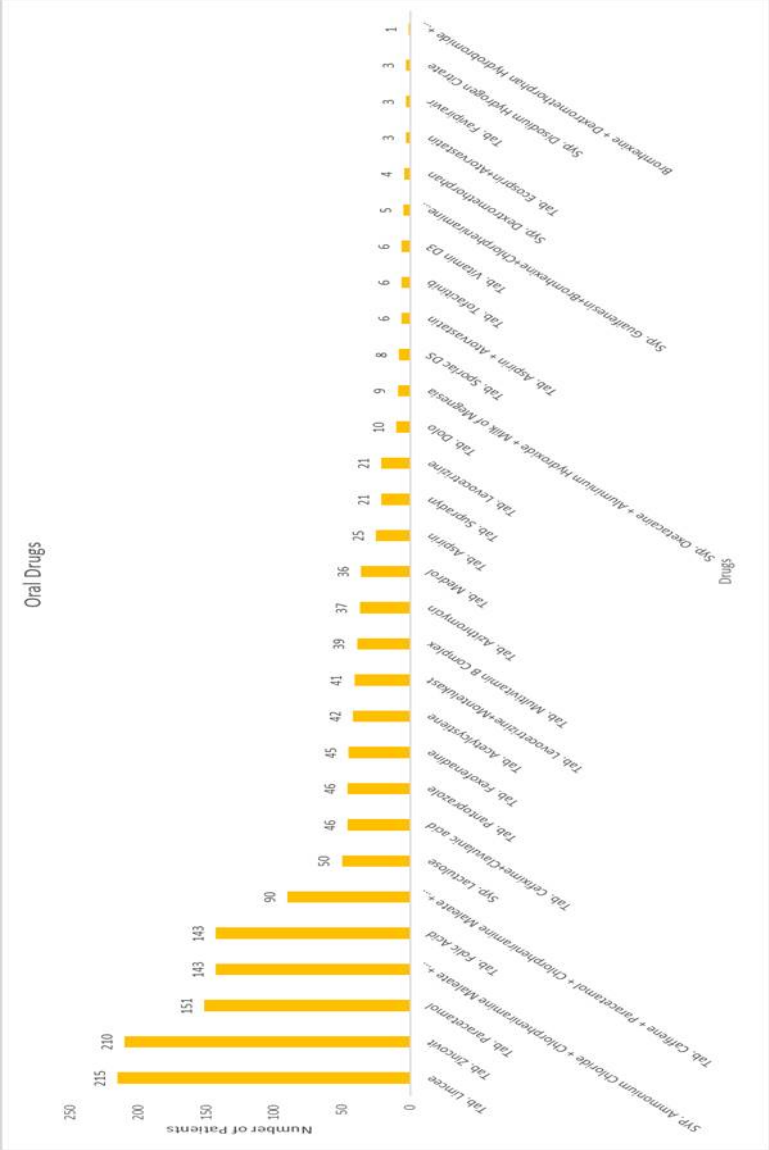

Figure 4: Oral drugs prescribed to patients

vitamin and nutritional supplements, antibiotics: azithromycin, Antitussives: Syp. Guaifenesin Bromhexine + Chlorpheniramine Maleate + Dextromethorphan Hydrobromide, Steroids: dexamethasone and an antiviral remdesivir. We found that the majority of prescribed drugs were according to guidelines given by MoHFW for the management of COVID 19. Additionally, glucocorticoid/steroid: dexamethasone, methylprednisolone, anticoagulant: heparin, and adequate fluid management were part of standard treatment [16].

In the 2^{nd} wave, all medications were found as per the prescribed guidelines for mild, moderate, and severe severity. The prescribed treatment included antipyretics, mucolytics, antibiotics, anticoagulants, vitamins and nutritional supplements, probiotics, antitussives, antiemetics, and antacids. As per standard guidelines of MoHFW, the recommended drugs included analgesics/antipyretics, anthelmintics, immunomodulators, and steroids [14]. For moderate severity, the same class of drugs were prescribed, but mixed antibiotics and steroids in moderate severity. Whereas the MoHFW includes analgesics/antipyretics, anthelmintics, immunomodulators, steroids, anticoagulants, and antibiotics only if required [14, 17]. Same was with severe COVID infection, but the addition was that the patients were given oxygen support due to concern regarding SPO2 concentration. All the treatments prescribed were in accordance with the standard treatment guidelines with the symptomatic treatments and also managing and treating comorbid conditions.

Limitations

This study may have had some intrinsic flaws, despite all efforts to make it impartial and scientific.

- Since the study was retrospective in nature, not all of the patient's data was available.
- Despite the lack of appropriate data, we have actively pursued this research in the hopes of achieving and justifying all of our goals.
- The study had a smaller sample size.

3. Conclusion

The prescribed treatment in both the 1^{st} and 2^{nd} waves was in compliance with the standard treatment guidelines provided by the MoHFW, India. During 1^{st} wave, 100% recovery was seen at CHARUSAT Hospital, i.e., all 73 patients during the 1^{st} wave were recovered. 199 (92.55%) patients were recovered during 2^{nd} wave at CHARUSAT hospital, followed by 9 (4.18%) mortalities.

References

[1] Introduction to COVID-19: methods for detection, prevention, response.

[2] Basics of COVID-19 CDC. June 2021.

[3] WHO Coronavirus (COVID-19) Dashboard. WHO Coronavirus (COVID-19) Dashboard With Vaccination Data. 2021. URL https://covid19.who.int/.

[4] A. Sahebnasagh, R. Avan, F. Saghafi, M. Mojtahedzadeh, A. Sadremomtaz, O. Arasteh, et al. Pharmacological treatments of COVID-19. *Pharmacol Rep*, 72(6):1446–1478, 2020. URL http://dx.doi.org/10.1007/s43440-020-00152-9.

[5] M. Dhaliwal and V. Raghunathan. Pharmacological management of COVID-19. *J Pediatr Crit CARE*, 7(7):42, 2020. URL http://dx.doi.org/10.4103/jpcc.jpcc_66_20.

[6] Mayar Allam, Shuangyi Cai, Shambavi Ganesh, Mythreye Venkatesan, Saurabh Doodhwala, Zexing Song, Thomas Hu, Aditi Kumar, and Jeremy Heit. COVID-19 Diagnostics, Tools, and Prevention. *Diagnostics*, 10(6):409, 2020. URL http://dx.doi.org/10.3390/diagnostics10060409.

[7] S. Bhaumik, O. John, and V. Jha. Low-value medical care in the pandemic—is this what the doctor ordered? *Lancet Glob Health*, 9(9): e1203–4, 2021. URL http://dx.doi.org/10.1016/s2214-109x(21)00252-7.

[8] *CLINICAL MANAGEMENT PROTOCOL FOR COVID-19 (In Adults) Version 3.* Government of India Ministry of Health and Family Welfare.

[9] M. M. A. Molla, M. Yeasmin, M. K. Islam, M. M. Sharif, M. R. Amin, T. Nafisa, et al. Antibiotic prescribing patterns at COVID-19 dedicated wards in Bangladesh: Findings from a single center study. *Infect Prev Pract*, 3(2):100134, 2021. URL http://dx.doi.org/10.1016/j.infpip.2021.100134.

[10] M. Xie and Q. Chen. Insight into 2019 novel coronavirus-An updated interim review and lessons from SARS-CoV and MERS-CoV. *Int J Infect Dis*, 94:119–24, 2020. URL http://dx.doi.org/10.1016/j.ijid.2020.03.071.

[11] World Health Organization. WHO Director-General's Opening Remarks at the Media Briefing on COVID-19—11 March 2020. Accessed on 11-march-2020.

[12] COVID-19 Situation Update Worldwide, as of Week 17, Updated 6 May 2021. *European Centre for Disease Prevention and Control*, 2021, 2021. URL https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases.

[13] Anil Neerukonda Hospital, Vishakapatnam. Prescription pattern among mild to moderate COVID-19 patients in Tertiary care centre. *Int. J. Health Res.*, 4(6):95–99, 2021.

[14] S. Lata, V. Khajuria, and V. Sawhney. Treatment pattern of covid-19 patients in a tertiary care teaching hospital of northern India. *Asian J Pharm Clin Res*, pages 48–51, 2021. URL http://dx.doi.org/10.22159/ajpcr.2021.v14i11.42345.

[15] L. F. Valladales-Restrepo, J. A. Giraldo-Correa, B. S. Aristizábal-Carmona, C. A. Constain-Mosquera, A. Sabogal-Ortiz, and J. E. Machado-Alba. Prescription patterns of drugs given to hospitalized COVID-19 patients: A cross-sectional study in Colombia. *Antibiotics (Basel)*, 11(3):333, 2022.

[16] Coronavirus Treatment: Is COVID-19 Treatable? August 2024.

[17] *CLINICAL MANAGEMENT PROTOCOL FOR COVID-19 (In Adults) Version 6.* Government of India Ministry of Health and Family Welfare.