

# “An Ambispective Study of Covid-19 Positive Cases during the Second Wave of Covid Pandemic Admitted To Basaveshwar Teaching and General Hospital and Their Post-Covid Complications”

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## ABSTRACT

**Background:** Humans have witnessed three deadly pandemics so far in the twenty-first century which are associated with novel coronaviruses: SARS, Middle East respiratory syndrome (MERS), and COVID- 19. All of these viruses, which are responsible for causing acute respiratory tract infections (ARTIs), are highly contagious in nature and/or have caused high mortalities. The recently emerged COVID- 19 disease is a highly transmittable viral infection caused by another zoonotic novel coronavirus named severe acute respiratory syndrome coronavirus.

**Keywords:** Covid-19, SARS, SARS COV-2, Corona Virus, Co-morbidities, Post Covid Complications, Spread of covid, Diagnosis of Covid-19, Covid-19 Vaccines.

**Objective:** To assess the second wave covid-19 cases for their clinical features, treatment, outcomes and post-covid complications.

**Method:** This Ambispective study will be carried out in following two phases- Phase 1 is of a Retrospective study conducted among 428 patients who admitted in Basaveshwar Teaching and General Hospital [BTGH] in Kalaburagi district for 3 months followed by the Prospective study conducted among 72 patients for their post-covid complications for 3 months.

**Results:** A Total of 428 patients were enrolled into the study, Majority of the cases belong to the age group 50-59 Years. Male patients were predominant than females, Majority of the co-morbid in covid positive cases had seen Hypertension(172) 40.2%, followed by 119 cases of DM (27.8%). In Diagnosing covid-19 CT Score ranges between  $\leq 10/25$  is 130 (30.4%) followed by  $16/25 - 20/25$  is 118 (27.6). Lab Investigations States that max abnormalities had seen majorly in Prothrombin time 424 cases (99.01%) followed by CRP – 324 (87.4%), LDH – 222 (51.8%), ESR –

218 (50.9).After recovering from covid-19, 72 patients were enrolled into the Prospective study to assess Post covid complications. Maximum complications were seen in Joints pains – 17 (23.6%), Fluctuations in Blood sugar – 13 (18%), Insomnia, Fatigue, Post external Malaise 12 cases each.

**Conclusion:** In the Age distribution of the study incidence was found more among the age 50-59, The incidence of covid-19 was found more among the hypertensive and diabetics patient. major symptoms among the covid patients was fever cough and breathlessness. . Even after vaccination they should take required precautions to avoid covid-19 as 10.5% of patients got covid even after receiving 2<sup>nd</sup> dose of vaccination. patients who recovered from covid-19 have shown varieties of complications among them majority were suffered with Joint pain and high blood pressure and fluctuations in blood sugar levels hypertension post external malaise fatigue and then insomnia.

## I. INTRODUCTION

The outbreak of coronavirus disease 2019 (COVID-19) began in Wuhan, Hubei Province in December 2019 and has rapidly spread throughout China. It is caused by a novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which is similar to the zoonotic SARS-CoV from 2002 and the Middle East respiratory syndrome coronavirus (MERS-CoV) from 2012. In a short time, COVID-19 has spread worldwide. On March 11, 2020, the World Health Organization (WHO) characterized COVID-19 as a pandemic.<sup>1</sup> Coronaviruses (CoVs) are named for the crown-like spikes on their surface and belong to the family Coronaviridae within the order Nidovirales. Coronaviruses broadly infect vertebrates including humans, birds, bats, snakes, mice, and other wild animals. Since the mid-1960s, seven known human

coronaviruses (HCoVs) have been identified. Four commonly detected HCoVs are 229E, OC43, NL63 and HKU1. In one study, 229E and OC43 accounted for approximately 15–29% of respiratory pathogens with relatively low virulence in humans. Another epidemiological study in adults estimates that coronavirus causes about 15% of common colds. Other significant causes of upper respiratory infections include influenza virus, rhino- virus, parainfluenza virus, Group A Streptococci, EBV and respiratory syncytial virus (RSV).<sup>2</sup>

#### Mode of infection:

Coronaviruses, typically, are enveloped viruses with a single-strand, positive-sense RNA genome with a size of ~26 to 32 kilobases, which is the largest known genome for an RNA virus. Although all types of coronaviruses share similarities in the organization and expression of their genome, based on their phylogeny, they have been classified into four different genera: Alphacoronavirus, Betacoronavirus, Gammacoronavirus, and Deltacoronavirus. The S glycoprotein binds to the ACE2 receptor on the surface of host to gain entry into the cell. The S1 subunit of the Betacoronavirus spike proteins displays a multi- domain architecture and is structurally organized in four distinct domains: A–D. Among these domains, A and B possibly serve as receptor-binding domains (RBDs), necessary for binding with host cell receptor. Meanwhile, the S2 subunit contains other domains required for fusion and intracellular trafficking into the host cell. The S glycoprotein binds with the ACE2 (an ectoenzyme) receptor on the surface of host cell.

Different types of coronavirus infections are commonly found in various domestic animals, such as respiratory disease in dogs (canine respiratory coronavirus), gastrointestinal infections in bovine, canine, turkey, etc., which are typically caused by a variety of coronaviruses including bovine coronavirus, feline coronavirus, etc. whereas coronavirus infections in human beings typically affect the upper respiratory and gastrointestinal tracts and may often cause mild, self-limiting diseases including common cold; however, in many cases, it is also responsible for more severe manifestations such as bronchitis and acute pneumonia. Currently, there are seven different types of coronaviruses which are known to cause infections in humans; these are classified into low pathogenicity (HCoV 229E, NL63, OC43, and HKU1) and high pathogenicity coronaviruses (SARS-CoV, MERS-CoV, and SARS- CoV-2).

Low pathogenicity coronaviruses typically cause mild diseases with non-serious respiratory syndrome, which are globally endemic. However, in the last two decades, three highly pathogenic, novel zoonotic coronaviruses have emerged and have caused lethal human infections, including SARS-CoV-2 which has generated grave public concern.<sup>7</sup>

**Signs and symptoms:** Most of the infected patients with COVID-19 had a history of being in contact with virus contained surface or infected patients or carriers of the virus. In the starting of the pandemic many were not aware of the disease and its symptoms. Furthermore, the infected patients have common symptoms relative to common cold like fever, cough, fatigue, and shortness of breath in severe cases. The most common complication among the infected patients was pneumonia followed by respiratory disorders and shocks were rarely found.

**Diagnosis:** Early diagnosis and isolation of suspected patients play a vital role in controlling this outbreak. As there are no exact diagnostic tools and equipment in the starting of pandemic, the diagnosis is based on the symptoms they have and later the new ways of diagnosis were found. The specificity and sensitivity of different diagnostic techniques differs between populations and the types of equipment employed. Several procedures have been recommended for the diagnosis of COVID-19:

- Clinical presentation
- Nonspecific screening tests for covid-19 in exposed patients
- Radiological Findings
- Molecular Diagnosis
- Immunological Diagnosis
- Novel Techniques

#### Management of COVID-19:

The treatment guidelines for COVID-19 vary between countries. The WHO guidelines are very general, recommending management of symptoms, and advise caution with pediatric patients, pregnant women and patients with underlying co-morbidities. There is no approved treatment for COVID-19; the recommendation is to provide supportive management according to each patient's need (e.g. antipyretics for fever, oxygen therapy for respiratory distress). Moreover, WHO recommendations indicate that severe cases should be given empiric antimicrobial therapy, with mechanical ventilation implemented depending on the patient's clinical condition. Some of the Asian

guidelines (e.g. the Japanese guidelines) were not easy to interpret as they have not yet been translated into English. However, the treatment protocols across countries are similar, and include hydroxychloroquine, chloroquine phosphate, remdesivir and lopinavir/ritonavir.<sup>12</sup>

**Drugs:** Although to date, there is no drug to successfully treat COVID-19, and the drugs prescribed are majorly to treat the symptoms that persist and then later on scientists have shown some success of broad-spectrum antivirals and some other drugs in treating the infections of SARS-CoV-2. Around 15 different drugs are being tested for the treatment of COVID-19 infections. These include, chloroquine and hydroxychloroquine, lopinavir and ritonavir, nafamostat and camostat, famotidine, umifenovir, nitazoxanide, ivermectin, corticosteroids, tocilizumab and sarilumab, bevacizumab, and fluvoxamine.

**Covid-19 Vaccines in India:** India has the second-highest confirmed cases of COVID-19 in the world after the United States and is reported as the third highest country regarding the total death cases.<sup>13</sup> India, which has a robust vaccine development program, not only plans for domestic manufacture of COVID-19 vaccine but also for its distribution in countries that cannot afford to buy expensive vaccines from the Western world. In India, the data emanating from clinical trials of different vaccines support their eligibility for emergency authorization, even though some of the final details are not available yet. The emphasis now is on the quality control, quality production, and cost control of these vaccines to make them affordable to even the poorest nations in the world.

- Covishield by the Serum Institute of India
- Covaxin by Bharat Biotech Ltd
- ZyCoV-D by Cadila Healthcare (Zydus Cadila)
- COVID vaccine (still unnamed) by Biological E. Limited
- Sputnik V by Dr. Reddy's Laboratories
- HDT-301 by Gennova Biopharmaceuticals Ltd

## II. MATERIALS AND METHODS:

This Ambispective study will be carried out in following two phases

### PHASE – I: (Retrospective Study)

Source of data: Case sheets of covid positive cases from MRD, BTGH.

#### Method and collection of data:

- **Study site:** Basaweshwar Teaching and General Hospital [BTGH] in Kalaburagi district.
- **Study duration:** The study will be carried out for a period of 3 months.
- **Study design:** —A Retrospective study
- **Study Criteria:** The Retrospective data of covid-19 patients will be collected by considering following study criteria.

#### Inclusion criteria:

- Covid-19 positive cases of above 18 years age.
- Covid-19 positive cases of either gender.
- Covid-19 positive cases irrespective of their co-morbidities.
- Covid-19 positive cases irrespective of their Covid Immunization status.

#### Exclusion criteria:

- Covid-19 positive cases whose complete data is not available.
- Covid-19 positive cases who discharged against medical advice.

#### Case study procedure:

This Retrospective Study will be initiated with the prior permission from the Medical Superintendent [MS] BTGH and with prior approval of institutional ethics committee. the required data will be collected from the Medical Record Department [MRD] BTGH. The record of covid-19 cases from March 2021 to August 2021 which were suffered under second wave are collected and entered into a suitably designed data collection form. The data collected will be analyzed as per the objective of the study.

#### PHASE – II: (Prospective Study)

##### Source of data:

- Patients personal case file
- Lab reports and prescriptions

#### Method and collection of data:

- —**Study site:** residence of the patients who were discharged from BTGH.
- —**Study duration:** The study will be carried out for a period of 3 months.
- —**Study design:** —A Prospective study
- —**Study Criteria:** The data of covid-19 patients will be collected by considering following study criteria.

**Inclusion criteria:**

- Covid-19 positive cases which were collected during first phase.
- Covid-19 positive cases who were discharged from BTGH Six months back.
- patient whose complete residential address and contact number is available.
- Patients who are willing to participate in the Study.

**Exclusion criteria:**

- Patients who are not willing to participate.
- Patients whose residential address and contact details are incomplete/not available

**Case study procedure:**

The study participants who fit into the study criteria will be enrolled into the study by taking a written consent whose correct address and contact details were available in case sheets during the phase-I of the study and who have been negative for RT-PCR for six months will be contacted by telephonic method or by personal visit and interviewed them regarding their post-covid complications and their treatment. Personal case sheets, Prescriptions, lab reports and other relevant records will be analyzed. The present status of the patient will also be noted.

**III. RESULTS**

**DEMOGRAPHIC DETAILS:**

**Table No.1: Age and gender wise distribution of cases**

Age in years	Males		Females		Total	
	No.	%	No.	%	No.	%
<b>30—39</b>	87	29.3	16	12.2	103	24.1
<b>40—49</b>	51	17.2	21	16.0	72	16.8
<b>50—59</b>	77	25.9	63	48.2	140	32.7
<b>60—69</b>	37	12.5	26	19.8	63	14.8
<b>≥ 70</b>	45	15.1	5	3.8	50	11.7
<b>Total</b>	297	100.0	131	100.0	428	100.0
<b>Mean ± SD</b>	50.46 ± 10.13		52.39 ± 10.92		51.42 ± 10.34	
<b>t-test, P-value</b>	= 1.453,		P = 0.147,		NS	

Majority of cases 140 (32.7%) were belongs to the age group of 50-59 years, followed by 103 (24.1%) of cases were belong to the age group of 30-39 years and 72 (22.0%) of cases were belongs to the age group of 40-49 years. The mean age of all cases was 51.42 years, males mean age

was 50.46 years and females mean age was 52.39 years. The minimum age of the patient was 30 years and maximum age was 78 years There is no statistical significant difference of mean age between males and females (P>0.05).

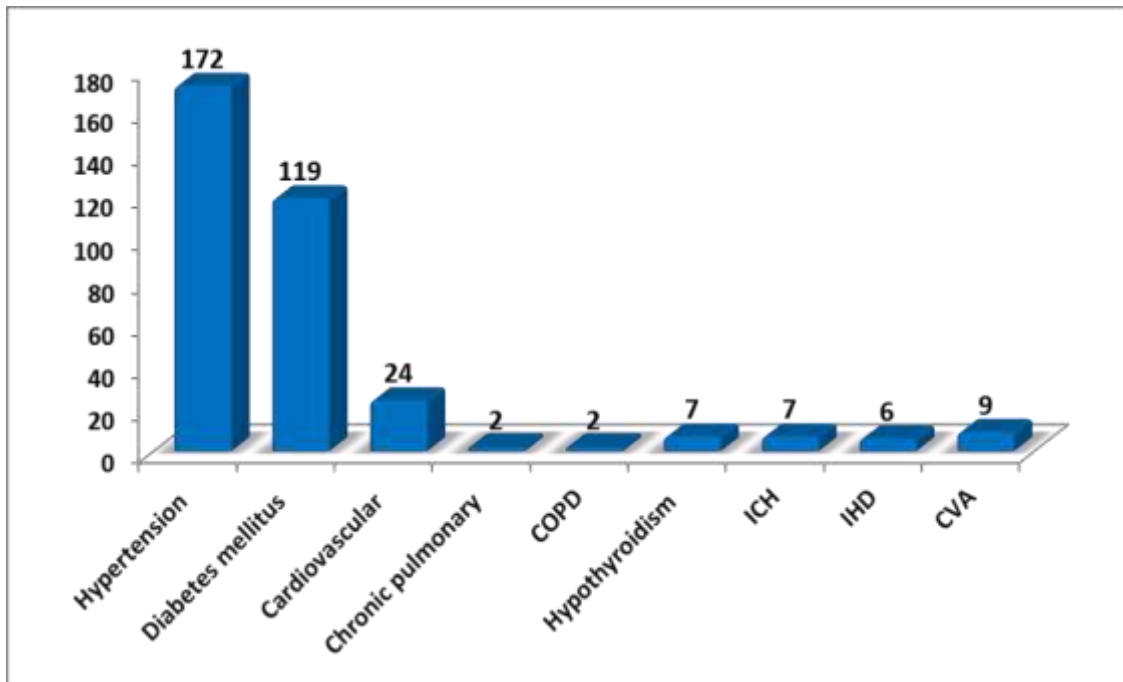
**COVID-19 TRANSMISSION DETAILS**

**Table No.2: Co-morbid wise distribution of COVID-19 positive cases**

Co-morbid	Number of cases	Percentage
Hypertension	172	40.2
Diabetes mellitus	119	27.8
Cardiovascular	24	5.6
Chronic pulmonary	2	0.5
Any other		
COPD	2	0.5
Hypothyroidism	7	1.6
ICH	7	1.6
IHD	6	1.4
CVA	9	2.1

Study observed that: Majority of co-morbid in covid-19 positive cases 172 (40.2%) had seen hypertension, followed by 119 (27.8%) of

cases co-morbid was diabetes mellitus and 24 (5.6%) of cases co-morbid was cardiovascular

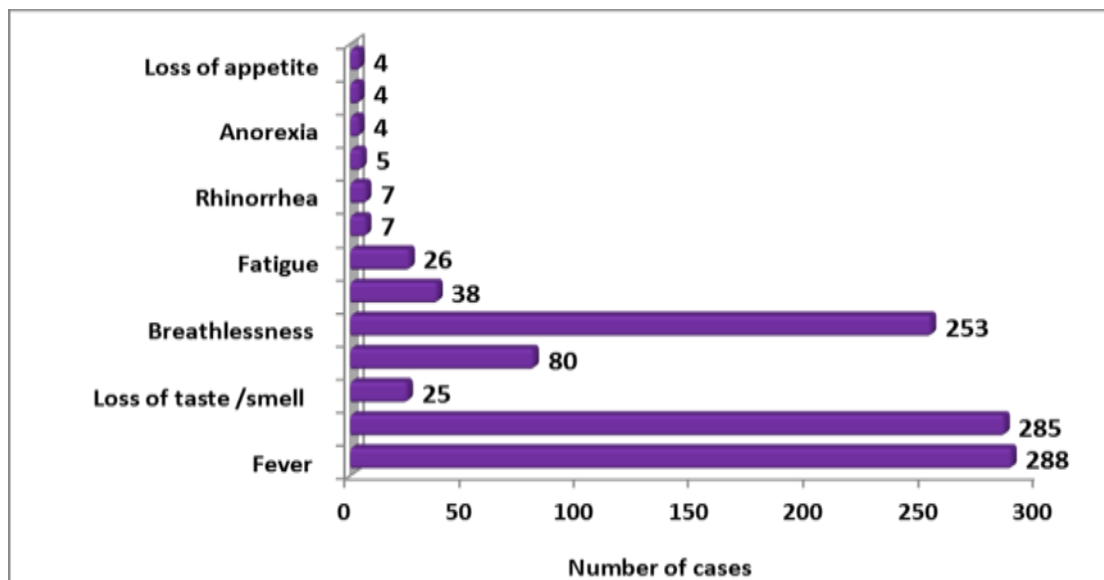


**Table No.3: Clinical presentation wise distribution of COVID-19 positive cases**

Clinical presentation	Number of cases	Percentage
Fever	288	67.3
Cough	285	66.6
Loss of taste /smell	25	5.8
Muscle /Joint pain	80	18.7
Breathlessness	253	59.1
Generalized weakness	38	8.9
Fatigue	26	6.1
Loose Stools	7	1.6
Rhinorrhea	7	1.6
Sore throat	5	1.2
Anorexia	4	0.9
Headache	4	0.9
Loss of appetite	4	0.9

Study observed that: out of 428 sample covid-19 positive cases; 288 (67.3%) of cases clinical presentation was fever, 285 (66.6%) of

cases clinical presentation was cough and 253 (59.1%) of cases clinical presentation was breathlessness.



**Table No.4: Vaccine of COVID-19 wise distribution of cases**

Vaccine	Doses	Number of cases	Percentage
Received	1dose	43	10.0
	2 doses	45	10.5
Not received	--	141	33.0
Information not available	--	199	46.5

Study observed that; only 88 (20.5%) of covid-19 positive cases had received vaccine among them one dose receivers were 43 (10.0%)

and two doses receivers were 45 (10.5%) and 199 (46.5%) cases information was not available about vaccination

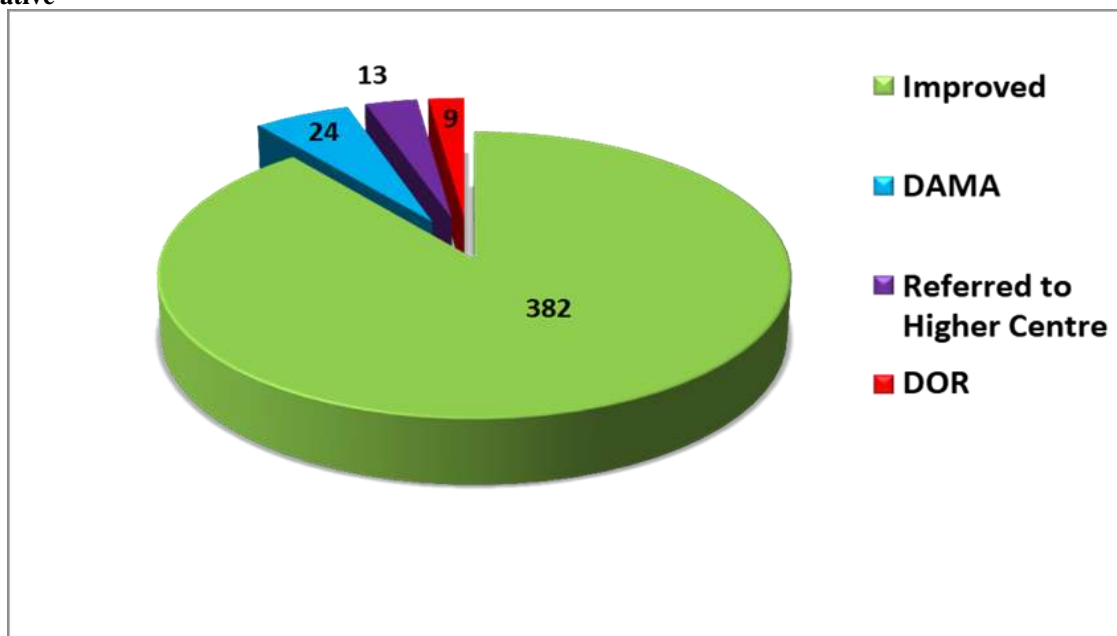
**Table No.5: Treatment outcome wise distribution of cases**

Treatment outcome	Number of cases	Percentage
Improved	382	89.3
DAMA	24	5.6
Referred to Higher Centre	13	3.0
DOR	9	2.1
Total	428	100.0

Study observed the outcome of treatment 382 (89.3%) of cases were improved, 24 (5.6%) of cases went against medical advice (DAMA), 13

(3.0%) of cases were referred to higher centre and 9 (2.1%) of cases were DOR.

After the treatment follow-up investigation of RT-PCT got the information 344 (80.0%) cases report were negative



#### IV. DISCUSSION

Humans have witnessed three deadly pandemics so far in the twenty-first century which are associated with novel coronaviruses: SARS, Middle East respiratory syndrome (MERS), and COVID-19. All of these viruses, which are responsible for causing acute respiratory tract infections (ARTIs), are highly contagious in nature and/or have caused high mortalities. The recently emerged COVID-19 disease is a highly transmittable viral infection caused by another zoonotic novel coronavirus named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The purpose of this study was to assess the Second wave covid-19 cases for their clinical features, lab parameters, comorbidities, and post-Covid complications of the patients who have been admitted in Basaveshwar Teaching and General Hospital, Kalaburagi.

This is a Ambi-directional cohort study in which the retrospective study includes the collection of patient specific parameters like Clinical features, lab parameters (before and after treatment), treatment type, comorbidities and vaccination details and the prospective phase of the study includes the assessment of post covid complications among the patients who were discharged showing negative RT-PCR report during the Second wave of covid pandemic.

A Total of 428 patients were enrolled in the retrospective study of aged above 18 years and a total of 72 patients were enrolled for prospective observational study. In the retrospective study, the required data will be collected from the Medical Record Department [MRD] BTGH. The record of covid-19 cases from March 2021 to August 2021 which were suffered under second wave are collected and entered into a suitably designed data collection form and analyzed. In the Prospective study, the study participants who fit into the study criteria will be enrolled into the study by taking a written consent whose correct address and contact details were available in case sheets during the phase-I of the study and who have been negative for RT-PCR for six months will be contacted by telephonic method or by personal visit and interviewed them regarding their post-covid complications. In Phase I of the study, Majority of cases 140 (32.7%) were belongs to the age group of 50-59 years, followed by 103 (24.1%) of cases were belong to the age group of 30-39 years and 72 (22.0%) of cases were belongs to the age group of 40-49 years. The mean age of all cases was 51.42 years, males mean age was 50.46 years and females

mean age was 52.39 years. The minimum age of the patient was 30 years and maximum age was 78 years. There is no statistical significant difference of mean age between males and females ( $P > 0.05$ ). Male patients were predominant 197 (69.4%) than female patients 131 (30.1%). Male to female ratio M: F was 2.26:1.

In the study Majority of co-morbid in covid-19 positive cases 172 (40.2%) had seen hypertension, followed by 119 (27.8%) of cases co-morbid was diabetes mellitus and 24 (5.6%) of cases co-morbid was cardiovascular. The clinical presentation of the study states that out of 428 sample covid-19 positive cases; 288 (67.3%) of cases clinical presentation was fever, 285 (66.6%) of cases clinical presentation was cough and 253 (59.1%) of cases clinical presentation was breathlessness, followed by muscle/joint pains - 80 (18.7), Generalized weakness - 38 (8.9), 26 (6.1) cases clinical presentation was Fatigue and 4 (0.9) cases each of Headache, Anorexia, Loss of appetite. The Study conducted by Ye Minn H et al.<sup>10</sup> was found to be similar with the most common presenting symptoms were fever 54.1%, loss of smell 50.3%, and cough 30.9%. Among 37.8% of COVID-19 patients with comorbidities, the most common comorbidities were hypertension 58.3%, diabetes mellitus 29.8%, and heart diseases 26.2%, respectively.

The Diagnostic tests RAT report was seen 101 (23.7%) positive, 26 (6.0%) cases negative and 301 (70.3%) cases had not done RAT. Out of 428 (100.0%) all cases tested RT-PCR, 421 (98.4%) of cases report was positive and 7 (1.6%) cases report has not reviewed. 47 (11.0%) of cases have done chest X-ray. In the study CT or HRCT diagnosed cases were 378 (88.3%). 50 (11.7%) of cases had not diagnosed CT or HRCT.

In the Lab investigations of COVID-19 positive cases before the treatment Maximum abnormal cases had seen in prothrombin time 424 (99.0%), followed by CRP-374 (87.4%), LDH-222 (51.8%), ESR-218 (50.9%) and Lymphocytes- 201 (47.0%) and the Study observed that; only 88 (20.5%) of covid-19 positive cases had received vaccine among them one dose receivers were 43 (10.0%) and two doses receivers were 45 (10.5%) and 199 (46.5%) cases information was not available about vaccination the outcome of treatment 382 (89.3%) of cases were improved, 24 (5.6%) of cases went against medical advice (DAMA), 13 (3.0%) of cases were referred to higher center and 9 (2.1%) of cases were DOR. After the treatment follow-up investigation of RT-



PCT got the information 344 (80.0%) cases report were negative

The Lab investigations of COVID-19 positive cases after the treatment states that Maximum abnormal cases had seen in prothrombin time 424 (99.0%), followed by CRP-374 (87.4%), LDH-222 (51.8%), ESR-218 (50.9%) and Lymphocytes- 201 (47.0%)

Comparison of Lab investigations before and after treatment of COVID-19 positive cases shows that There was no statistical significant difference of mean Platelet count, Lymphocytes, ALT, S Ferritin, LDH between before and after treatment ( $P>0.05$ ).

There was statistically highly significant difference of mean HB, WBC, AST, Prothrombin Time, Creatinine, ESR, CRP, IL-6, D-Dimer and Procalcitonin between before and after treatment ( $P<0.001$ ). Mean values of HB, WBC, D-Dimer and procalcitonin values were increased after the treatment as compared to before treatment.

Whereas mean AST, Prothrombin Time, Creatinine, ESR, CRP, IL-6 values were decreased after treatment as compared to before treatment.

The Phase – II of the study, after recovery from covid-19 and showing negative for RTPCR, Does the patient have ever been suffered with any of the complications studied on 72 sample cases, In the out of 72 sample cases 71 (98.6%) cases were recovered and only 1 dead case had observed. Among them 72 (100.0%) of cases 29 (40.3%) of cases were interviewed directly and 43 (59.7%) of cases were interviewed by telephone. In the study maximum complications after recovery from covid-19 cases were seen Joint pain-17 (23.6%), High blood sugar / Low blood sugar Know cases were 13 (18.0%), each 12 cases of Fatigue, Insomnia, Hypertension / Hypotension known cases and post-exertional malaise cases respectively and 10 (13.9%) of cases were muscle pain. Our findings were found to be similar with Raminder A et al.<sup>18</sup> reports which shows breathlessness (36.5%), Joint pains (20.5%)

## V. CONCLUSION

The age distribution of the study shows the covid-19 has not spared any age group but the incidence was found more among the age (50-59)

The incidence of covid-19 was found more among male than the females. Male patients were predominant (69.4%) than female patients (30.1%)

The incidence of covid-19 was found more among the hypertensive and diabetics patient

When clinical presentation was analysed fever cough and breathlessness were the major symptoms among the covid-19 patients

The major tools used for diagnosis of covid-19 was RTPCR and CT scan

It is very interesting to know that 10% of the patients got covid after receiving 1<sup>st</sup> dose of vaccination and 10.5% of patients got covid even after receiving 2<sup>nd</sup> dose of vaccination.

Even after vaccination they should take required precautions to avoid covid-19

Majority (89.3%) of the patients admitted to study site were recovered from the covid-19

The patients who recovered from covid-19 have shown varieties of complications among them majority were suffered with Joint pain and high blood pressure and fluctuations in blood sugar levels hypertension post external malaise fatigue and then insomnia

Finally we conclude that the covid-19 pandemic has produced a significant Socio-Economic burden on the society and led to so many major complications. Hence, The Pharmacist plays a vital role to educating the covid suffered patients to educate them regarding the Post covid complications and not to neglect any health issues. They have to consult the doctor immediately if any signs and symptoms persist which may be Post Covid Complications.

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