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Evaluation of Clinical Outcomes in Covid 19 Patients Treated with Casirivimab-Imdevimab Antibody Cocktail–A Prospective Observational Study

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A B S T R A C T

Cocktail is a composition of 2 antibodies Casirivimab and Imdevimab that is mostly given in the omicron variant of covid-19. The objectives of the study includes the post therapeutic effects, complications associated with administration if cocktail monoclonal antibodies. The methodology of the study is a prospective observational study was conducted for a period of 3 months. Ethical Committee clearance was obtained from Institutional Ethical Committee of Medicover Hospitals, Madhapur, Hyderabad. Data was collected from patient's case sheets and electronic medical record, who were admitted in various wards of hospital for cocktail treatment for 3 months (January 2022 to March 2022.), who fitted the inclusion criteria and the data was analyzed to know the cause of the covid-19 associated with different comorbid conditions, the management by using casirivimab and imdevimab antibodies. The study was resulted as From 42 enrolled patients gender, age, hospital stay days, comorbid type, No. of comorbid are classified and patients with end-stage diseases have undergone death. With no are less comorbid conditions have discharged earlier. Patients with high comorbid conditions had good protection. The hematological test like Hb, TLC, Platelets, IL-6, CRP, D-dimer were elevated and were normalized on discharge. The oxygen saturation levels have increased after treatment. Also the respiratory rate decreased from hyperventilation. Six deaths were recorded in 3 months they are with end-stage diseases of different organ system. The study are concluded as a revealed that Cocktail monoclonalantibodypreparation which contains Casirivimab and Imdevimab was proved to be safe, effective and had high margin to treat mild to moderate covid patients.

Keywords: Casirivimab, coronavirus 2, cocktail treatment and D-dimer.

A R T I C L E I N F O

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Contents

1. Introduction

The seventh human coronavirus, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was identified in Wuhan, Hubei province, China, in January 2020 [1,2]. Since then, the virus has spread throughout the entire world, infecting 4,806,299 people and killing 318,599 as of May 20, 2020 [3]. With death rates of 2.9%, 9.6%, and 36%, respectively, SARS-CoV-2, SARS-CoV, and Middle East respiratory syndrome coronavirus (MERS-CoV) all cause severe pneumonia [4-5]. The remaining four human coronaviruses, OC43, NL63, HKU1, and 229E, typically produce minor illnesses with self-limited course [6].

Origin of SARS-CoV-2

Scientists have argued regarding the origin of the new coronavirus SARS-CoV-2 ever since its discovery [7]. It has been hypothesised that SARS-CoV-2 was created by manipulations in a lab. Genetic evidence, on the other hand, refutes this theory and demonstrates that SARS-CoV-2 did not originate from a previously identified virus backbone [8].SARS-CoV-2 exhibits distinctive characteristics that set it apart from other coronaviruses, including an optimal affinity for the angiotensin converting enzyme 2 (ACE2) receptor and a polybasic cleavage site at the S1/S2 spike junction that determines infectivity and host range, according to genome analysis and comparison with previously known coronavirus genomes [7,9].

Epidemiology

Disease presentation

- ✓ Fever (83%), cough (82%), and shortness of breath (31%) [10].
- ✓ 2-10% gastrointestinal symptoms as vomiting, diarrhea, and abdominal pain are reported [10,11].
- ✓ Enoxaparin is administered subcutaneously to COVID-19 patients in a clinical trial recently approved by the Italian Agency of Medicine (AIFA) to reduce problems linked to thromboembolism.[12]

Incubation time of SARS-CoV-2

The length of quarantine and the effectiveness of contact tracing and admission screening depend on the knowledge of the SARS-CoV-2 infection's incubation period. The mean incubation period was determined to be 6.4 days using a Weibull distribution, with a 95% confidence interval (CI) of 5.6-7.7 and a range of 2.1-11.1 days (2.5th-97.5th percentile) [13].

VIRAL TESTING

- o RT-PCR assay
- o ANTIGEN TEST
- o CBNAAT
- o S GENE TEST [11]

Treatment for Covid-19 With Cocktails

Eligibility:

The FDA broadened the standards by which a patient with COVID-19 can be deemed to be at high risk for disease progression in May 2021. All outpatients 12 years of age who are overweight, expecting, have a chronic respiratory illness, cardiovascular disease, or hypertension are now qualified to receive monoclonal antibody therapy. When given to hospitalized COVID-19 patients who require high-flow oxygen or mechanical ventilation, monoclonal antibodies may be linked to worse clinical outcomes. Patients who are hospitalized for COVID-19 or who need oxygen therapy because of COVID-19 are not allowed to take casirivimab or imdevimab.

Mechanism of Action

Casirivimab and imdevimab bind to distinct places on the spike protein of SARS-receptor CoV-2's binding domain, preventing it from attaching to the human ACE2 receptor.

VARIANTS

Casirivimab plus imdevimab is ineffective against the Omicron variant of SARS-CoV-2. The combination continues to be active against the virus's Delta form.

ADVERSE EFFECTS

Casirivimab and imdevimab usage have been associated with injection- and infusion-related events, as well as anaphylaxis.

DOSAGE AND ADMINISTRATION

Casirivimab and imdevimab are available in 120 mg/mL vials for separate use and 60 mg/60 mg/mL vials for co-formulated solutions (infusion). Prior to preparing a dose, the vials should spend 20 minutes at room temperature before being stored in the refrigerator. The two antibodies should be administered as soon as feasible following a positive SARS-CoV-2 test result and within 10 days of the commencement of COVID-19 symptoms; they are only permitted for administration jointly.

OMICRON

The World Health Organization (WHO) recognised the omicron version as a covid-19 variant of concern on November 26. This designation has led to travel bans, a rush to speed up booster vaccination campaigns, and a resurgence of efforts to address vaccine inequality. Omicron poses a "very high" risk internationally, according to the WHO on November 29. According to early research, it may be a more transmissible form that could cause outbreaks of infection. On November 23, in South Africa, Omicron was discovered for the first time by researchers employing genome sequencing to look into a strange increase in case numbers there. Daily cases increased from 274 on November 11 to 1000 a fortnight later and now exceed 2000. [14]

Monoclonal Antibodies

Currently, seven of the eight authorised or approved mAbs (bamlanivimab, etesevimab, casirivimab, imdevimab, cilgavimab, tixagevimab, and regdanvimab) prevent the binding of the viral S protein to ACE2. Omicron variations demonstrated that authorised therapeutic antibodies, such as the combinations of Casirivimab and imdevimab and Bamlanivimab and etesevimab, were influenced by changes in the virus [15]. The REGN-COV2 (Casirivimab and Imdevimab), as well as the Rockefeller University antibody C135, are still effective against the omicron, according to early modeling studies [16].

Parameters of Covid-19

- SpO
- RESPIRATORY RATE
- CBP
- HB
- b)WBC
- PLATELETS
- D-DIMER
- C- REACTIVE PROTIEN
- IL-6
- HRCT
- CTCRT
- Lactate Dehydrogenase (LDH) [17]

Aim and Objectives

The aim of the present study is to assess the outcomes in the patients treated with cocktail monoclonal antibody preparation that contains Casirivimab and Imdevimab in patients with Covid-19.

Primary and secondary objectives:
To know the post therapeutic effects and hemodynamic changes, Concomitant treatment, To find out all the complications associated with the therapy

2. Materials and Methods

The study site in Medicover Hospitals, Hi-tech city, Madhapur, Hyderabad. The period of the study was conducted for a period of 3 months, January 2022 to March 2022. The study was approved by the hospital ethical committee from Medicover Hospitals, Hi-tech city, Madhapur, Hyderabad. The study criteria in inclusion are COVID Patients treated with cocktail monoclonal antibodies and exclusion criteria are The patients who are not treated with cocktail monoclonal antibodies. The type of the study was Manual questionnaire and prospective observational study. the source of the data was collected from the patients administered with cocktail monoclonal antibodies through a questionnaire after receiving the permission from the IEC of Medicover Hospitals.

3. Results and Discussion

A prospective observational study was carried out in Covid-19 patients who were treated with cocktail monoclonal antibodies therapy at tertiary care hospital. This study was conducted for a period of 3 months. In a period of 3 months, we have received 42 responses through phone calls and questioner after collecting data at hospital. Hence, we will be considering 42 patients as 100%.

Table 1: Gender wise distribution of samples

Gender	No. of Patients	Percentage
Male	22	52%
Female	20	48%

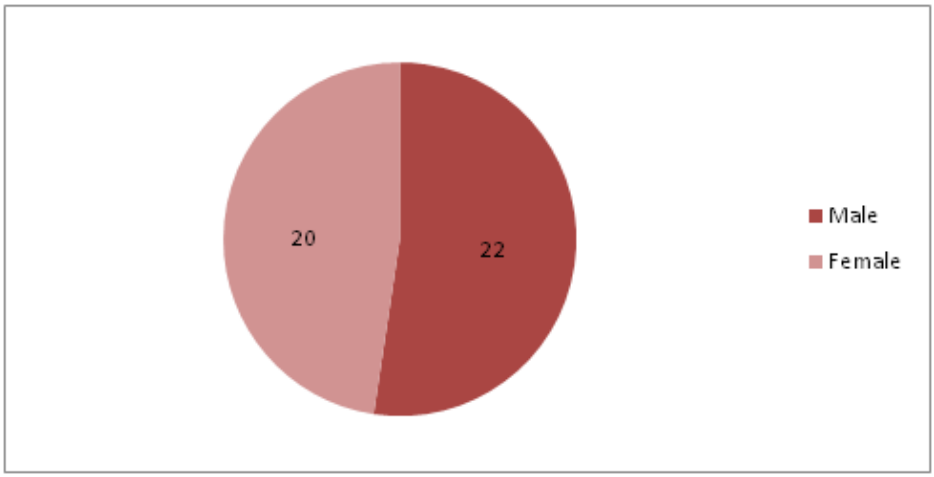

Fig 1: Gender wise distribution of samples

The above Pie chart depicts about the number of male and female patients enrolled in the study. It includes 22 (52%) male patients and 20 (48%) female patients from the 42 patients enrolled.

Table 2: Age wise distribution of samples

Age	No of patients	Percentage
15-25	1	2%
26-35	3	7%
36-45	6	14%
46-55	7	17%
56-65	14	33%
66-75	5	12%
76-85	5	12%
86-95	1	2%

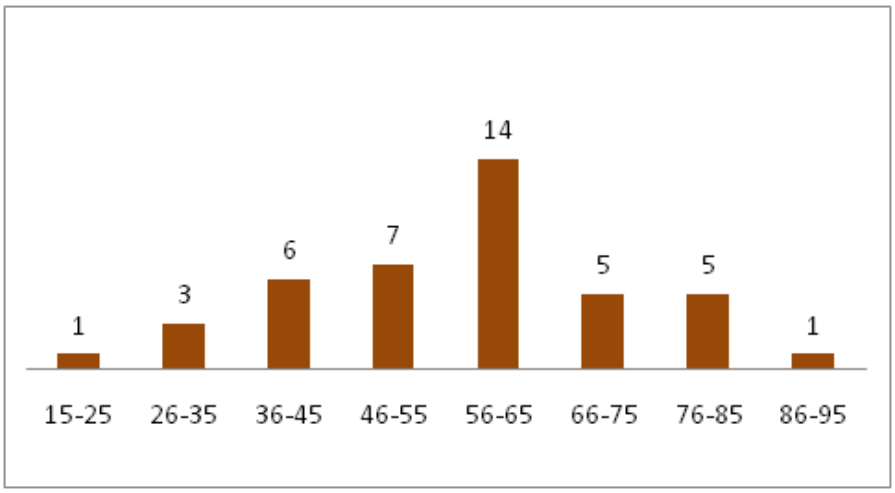

Fig 2: Age wise distribution of samples

As shown in the Table 2, 42 patients enrolled in this observational study are classified into different age groups.As cocktail monoclonal antibodies are not given to patients under age of 12 starting the age from 15 From 15-25 years 1 (2%) patient is in study, 26-35 years 3(7%) patients are in study, 36-45 years 6 (14%) patients are in study, 46-55 years 7 (17%) patients are in study, 56-65 years 14 (33%) patient are in study, 66-75 years 5 (12%) patient are in study, 76-85 years 5 (12%) patient are in study, 86-95 1(2%) patient is involved in study (figure 2).

Table 3: Comorbidities wise Distribution

No. of Comorbidities	No. of Patients	Percentage
No Comorbidities	6	14%
1 Comorbidities	6	14%
2 Comorbidities	7	17%
3 Comorbidities	8	19%
4 Comorbidities	6	14%
5 Comorbidities	4	10%
6 Comorbidities	3	7%
7 Comorbidities	1	2%
8 Comorbidities	1	2%

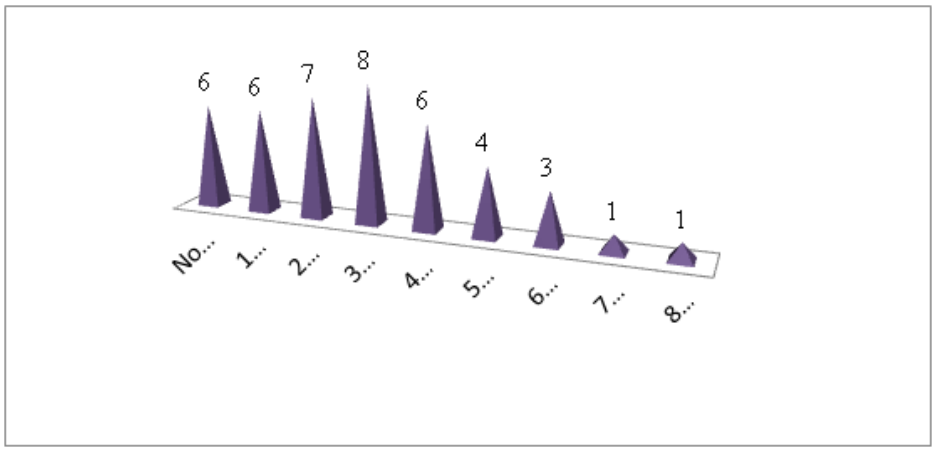

Fig 3: Comorbidities wise Distribution

The above figure depicts the classification between patients were done by no.of comorbid they are suffering from that includes HTN, DM, CAD, CKD, obesity bronchial asthma thyroid disease. From above bar graph was designed after taking information from 42 patients, 6 patients(14%) with no comorbidities, 6 patients(14%) with one comorbidity, 7 patients(17%) with 2 comorbidities, 8 patients(19%) with 3 comorbidities, 6 patients(14%) with 4 comorbidities, 4 patients(10%) with 5comorbidities, 3 patients(7%) with 6 comorbidities, 1 patient(2%) with 7 comorbidities, 1 patient(2%) with 8 comorbidities (table 3).

Table 4: Type of comorbid

Disease	No of patients	Percentage
HTN	25	59%
DM	26	61%
Thyroid	9	21%
Cardiac	16	38%
Neurology	7	16%
Nephrology	6	14%
Oncology	3	7%
Ortho	3	7%
Hepatology	2	4.7%
Pulmonology	4	9.5%
Dermatology	3	7%
Ophthalmology	2	4.7%

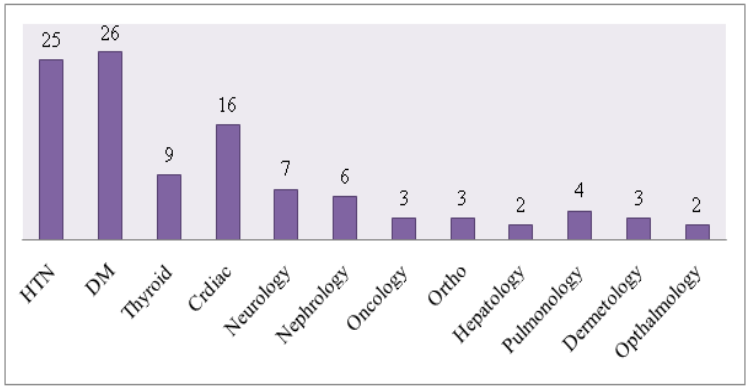

Fig 4: Type of comorbidities

As shown in table 4, out of 42 patients with multiple comorbid conditions 26(61%) were with DM; 25(59%) were with HTN; 9(21%) were with thyroid problem (hypo or hyper); 16 were with cardiac related problems like CAD, DVD etc; 7 were with neurology related issues like Parkinson, bipolar disorder, anxiety etc6 were with nephrological problems like glomerulo-nephritis, AKI, CKD ; 3 with oncology problems like pulmonary carcinoma etc; 3 with orthoi.e., bone related problems like TKR; 2 with liver diseases like CALD etc; pulmonology related problems like asthma; dermatology problem like psoriasis, scabies; and ophthalmic problem like cataract (figure 4).

Table 5: Type of vaccine taken wise Distribution

Type of vaccine	No of patients	percentage
Covishield	28	67%
Covaxin	13	31%
Pfizer	1	2%

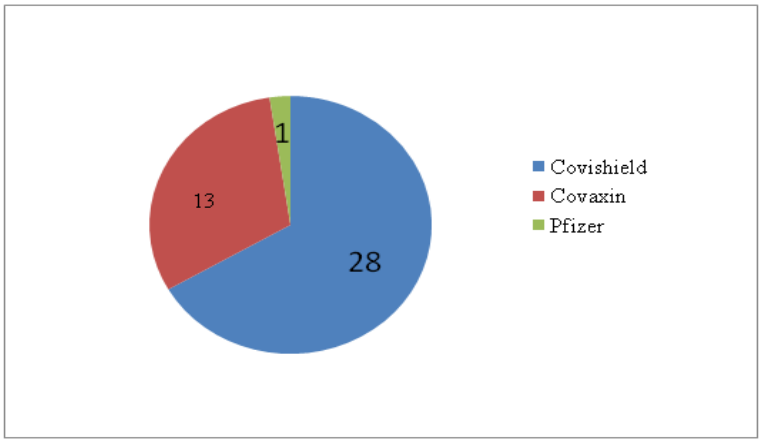

Fig 5: Distribution based on type of vaccine taken

The above Pie chart illustrates about the type of vaccine taken by the 42 (67%) enrolled patients in the study.It was found that majority of patients about 28 (31%) patients were taken Covishield, 13 patients took Covaxin and 1 (2%) patient took Pfizer (table 5)

Table 6: Mortality Status wise distribution

Mortality status	No of Patients	Percentage
Alive	36	86%
Dead	6	14%

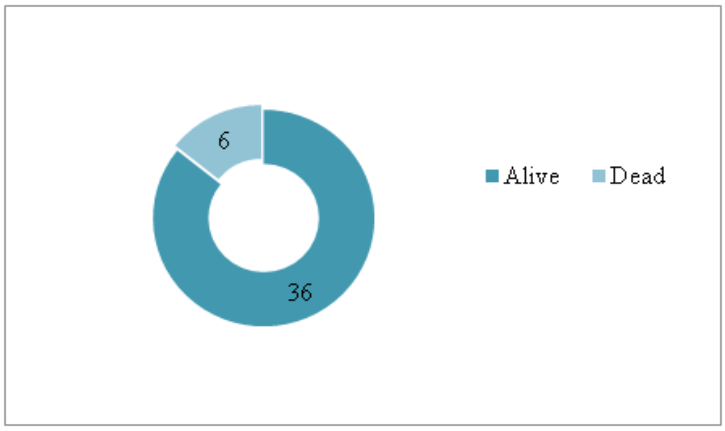

Fig 6: Mortality Status wise distribution

As shown in table 6, after 3 months follow up from 42 patients enrolled 6 (14%) were dead due to comorbidities and most of them are suffering from end stage diseases and 36 (86%) are live without any symptoms and we're cured from all symptoms by end of 3rd month (figure 6).

Table 7: Diagnostic tests wise distribution

Confirmatory test	No of patients	Percentage
RTPCR	30	73%
CBNAAT	5	12%
RAT	2	5%
RTPCT + RAT	2	5%
S gene + RTPCR	1	2%
CBNAAT + RTPCR	1	2%

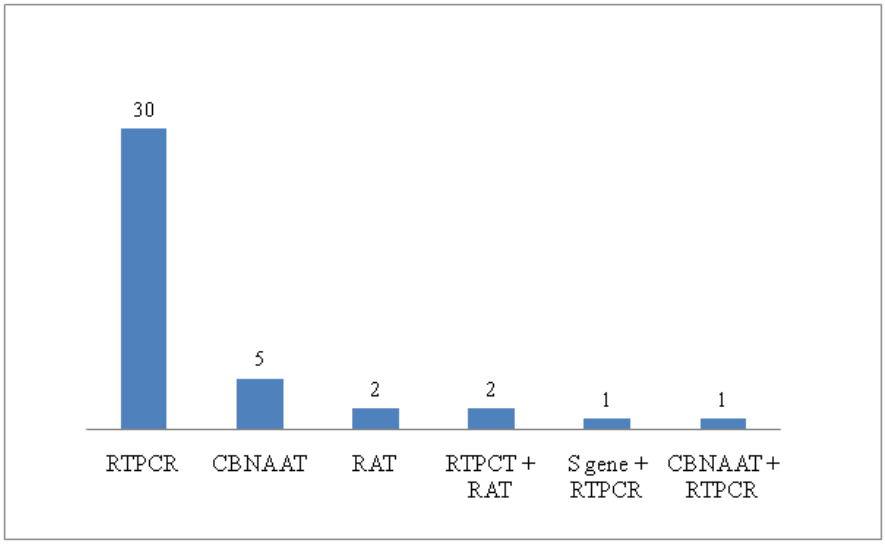

Fig 7: Diagnostic tests wise distribution

- As shown in table 7, from the enrolled 42 patients, diagnosis was confirmed by using 6 different 3 of them are combination of tests and 3 are individual test used to confirm covid pneumonia the tests include RTPCR, CBNAAT, RAT, RTPCR + RAT, RTPCR + S gene detection, RTPCR + CBNAAT.
- 30 (73%) out of 42 patients were diagnosed by RTPCR and 5(12%) of them with CBNAAT, 2(5%) with RAT, 2(5%) with RTPCR + RAT, 1(2%) with RTPCR + S gene detection, 1 (2%) with RTPCR + CBNAAT (figure 7).
-

Table 8: Outcomes of 3 months follow up

Symptoms	Month 1	Month 2	Month 3
Cold	4	4	0
Cough	7	6	0
Fever	5	0	0
loss of taste	1	1	1
sore throat	1	0	0
gastric trouble	1	0	0
weakness	0	0	0
Uncontrolled BP	2	2	0
Uncontrolled Glucose	3	3	0
Body pains	1	1	0
Altered sensorium	1	1	0
Cardiac Arrest	1	0	0
Headache	1	0	0
Recurrent Covid	1	0	0
SOB	0	1	0
No symptoms	19	25	34
Death	4	1	1

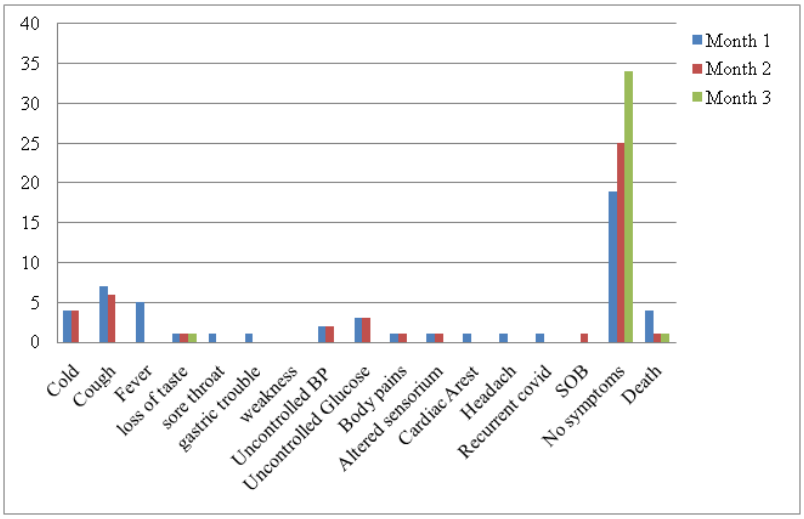

Fig 8: Outcomes of 3 months follow up

- In the 3 months follow up of 42 enrolled patients administers with cocktail monoclonal antibodies. In the first month of following 4 complained with cold, 7 with cough, 5 with fever 1 with loss of taste, 1 with sore throat,1 with dyspepsia 2 were having uncontrolled BP, 3 with uncontrolled glucose levels 1 with body pains 1 was having cardiac arrest 1 with headache and one with recurrent Covid and 4 deaths were reported one. First month 2 in the hospital 2 at their residence. 19 patients were alive without any symptoms
- Second month follow up revealed complaints of 4 with cold, 6 with cough, one with loss of taste, 2with uncontrolled BP, 3 with abnormal glucose level fluctuations, 1with altered sensorium, 1with body pains,1 with shortness of breath and a death were reported. 25 patients are without any symptoms
- In the third month follow up 1 patient complained with loss of taste and a death had happened, remaining all were free of symptoms.

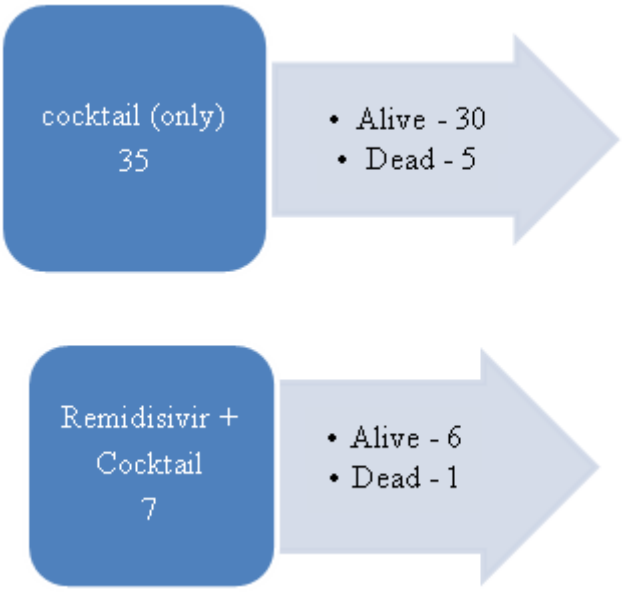

Fig 9: Differentiating treatment with cocktail and other anti-viral including mortality status

- On examining the mortality status of 42 patients enrolled in the study, 36 were alive and the remaining 6 members were dead due to their respective comorbidities during the 3 months follow up.
- Cocktail monoclonal antibodies (only) were administered to 35 people and 30 of them were alive; 5 of them were dead. Remdesivir + cocktail monoclonal antibodies were administered to 7, among them 6 were alive and 1 was dead.

Table 9: Hospitalization Stay wise distribution

No. of patients	No. of days in hospital	Percentage
3	2	7%
11	3	26%
8	4	19%
7	5	16%
3	6	7%
2	7	4.7%
3	8	7%
2	10	4.7%
2	11	4.7%
1	19	2%

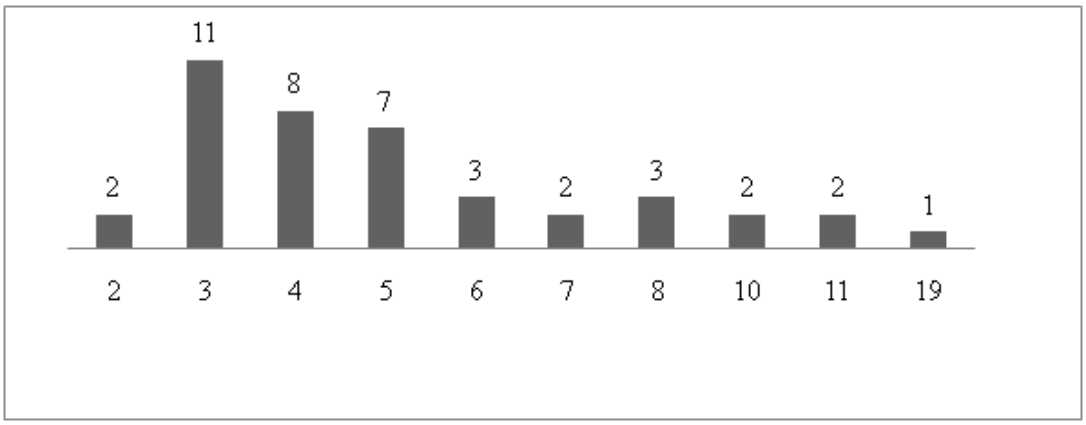

Fig 10: Hospital Stay wise distribution

Bar diagram represents number of days patients stayed in hospital (X-axis) vs number of patients (Y-axis) from 42 enrolled patients. It shows that 2 patients stayed for 2 days, 11 patients stayed for 3 days, 8 patients for 4 days, 7 patients for 5 days, 3 patients for 6 days, 2 patients for 7 days, 3 patients for 8 days, 2 patients for 10 days, 2 patients for 11days and 1 patient for 19 days.

Table 10: Oxygen saturation wise distribution

SpO_2	**SpO_2**
SpO_2 on date of admission	93%
SpO_2 on date of administration of cocktail	94%
SpO_2 on date of discharge	99%

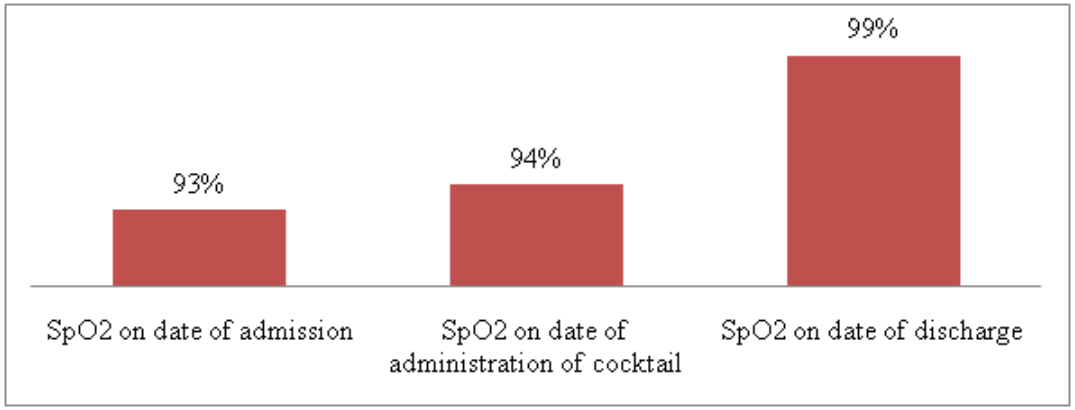

Fig no 11: Oxygen saturation wise distribution

The bar diagram depicts that out of 42 patients administered with cocktail monoclonal antibodies the spo_2 levels on date of admission is 93% i.e., moderate levels after administration of cocktail a slight increase in spo_2 i.e., 94% on the date of discharge SpO_2 levels had almost to maximum i.e., 99%

Table 11: Respiratory rate wise distribution

	Respiratory Rate
Respiratory Rate on Date of Admission	23.2
Respiratory Rate on Date of Discharge	20.1

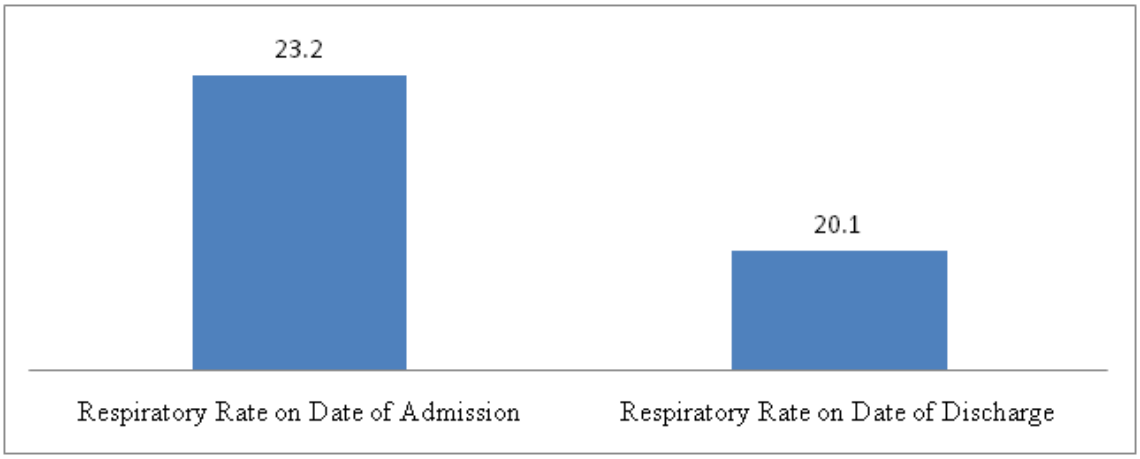

Fig 12: Respiratory rate wise distribution

Respiratory Rate of 42 patients on days of admission is 23.2 i.e., maximum patients are experiencing hyperventilation Respiratory Rate on Date of discharge is 20.1 came to normal i.e., in between 18-20.

Table 12: HRCT corads wise distribution

	HRCT	**Percentage**
6	33	78%
5	9	22%

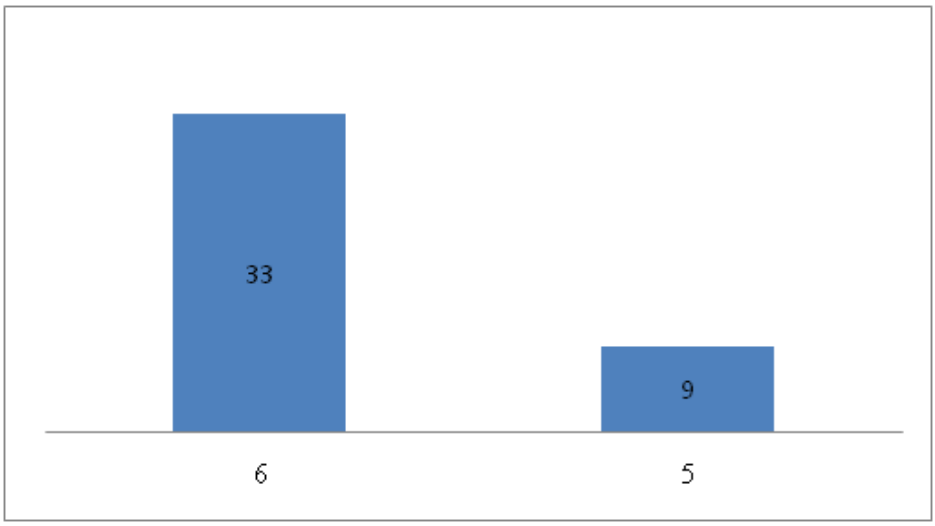

Fig 13: HRCT CORADS wise distribution

Out of 42 patients, HRCT-CORADS was found to be 6 for 33 (78%) patients mean RTPCR +ve and 9 patients (22%) HRCT-CORADS was found to be 5 mean they are with covid-19 but undergone test like RAT.

Table 13: CT-severity score wise distribution

	CT Severity	Percentage
Mild (0-8)	20	48%
Moderate(9-15)	16	38%
Sever (>15)	6	14%

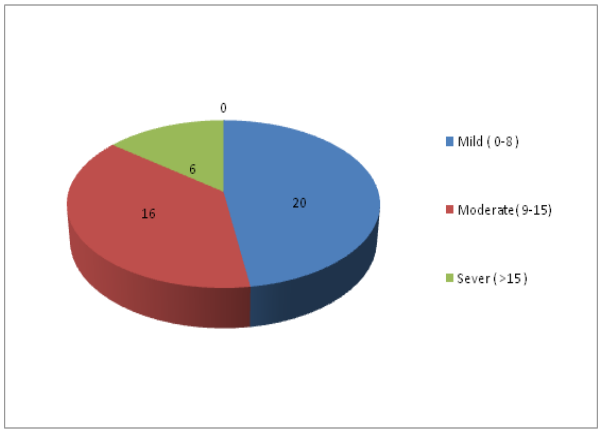

Fig 14: CT-severity score wise distribution

CT Severity scores of 42 patients were assessed and were noted that 20 were with mild lung involvement ranging from0. 0-8; 16 were with moderate lung involvement i.e., 9-15; 6 were with most lung involvement i.e., >15
The cocktail administration was done rationally.

Parameters study:

Haemoglobin: Normal Ranges:12-15 g/dl

Table 14: Haemoglobin monitoring

	Average	1.99
On the DOA	11.6	1.98
On the DOD	12.2	3.19

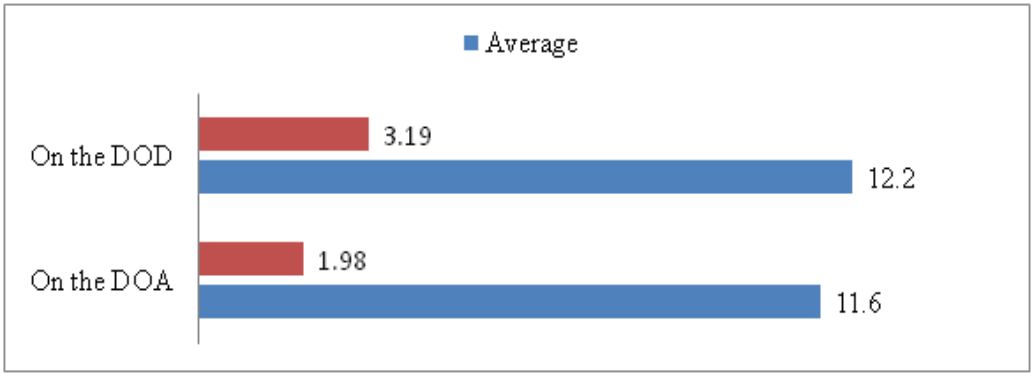

Fig 15: Haemoglobin monitoring

From the 42 enrolled patients in the study HB levels on the date of admission were little less than the normal range i.e., 11.6 (SD± 11.98) and reached to normal range 12.2 (SD ± 3.19) on the date of discharge after the administration of cocktail which is a positive response. Hb has been decreased due to low oxygen levels and hyperventilation and increased when the patients were not on need of oxygen or hyperventilation.

Total Leucocyte Count: Normal Range: 4-11 10^3/µL

Table15: TLC monitoring

	Average	SD
On DOA	5.8	2.94
On DOD	11.2	3.9

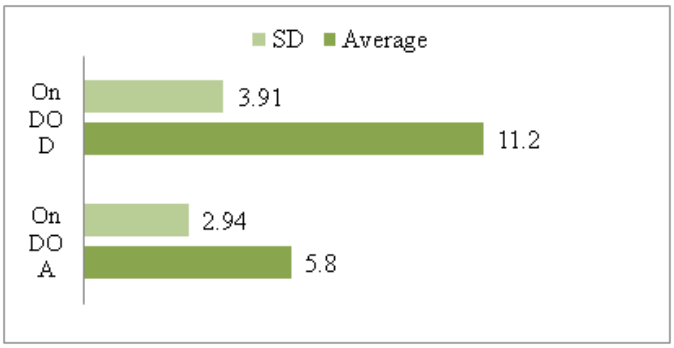

Fig 16: TLC monitoring

The above representation shows that the average Total leucocyte count was 5.8(SD ± 2.94) which is not within the normal range and then after administration of cocktail on the date of discharge it reached within the limits i.e., 11.2(SD ± 3.91). TLC has is on the normal range bud compatibility decreased due to infection and after treatment it increased

Platelets: Normal Range: 150-400 10^3/µL

Table16: platelets monitoring

	Average	**SD**
On DOA	205.6	77.6
On DOD	224.1	54.3

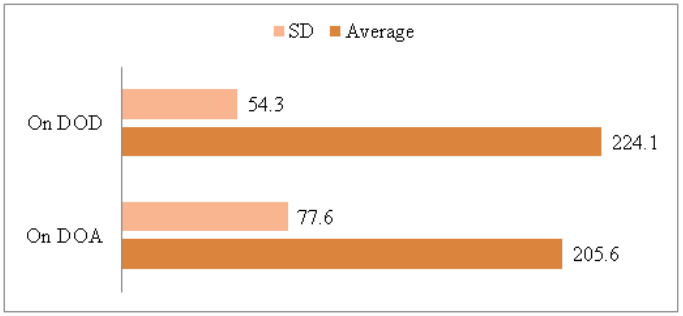

Fig 17: Platelets monitoring

The above representation shows that the platelets levels are within the normal limits Platelets are with in normal range indicates there is no clot formation due to cocktail infusion.

IL-6: Normal Range: 0-7 pg/ml

Table 17: IL-6 monitoring

	Average	SD
On DOA	31.2	43.7
On DOD	18.3	23.28

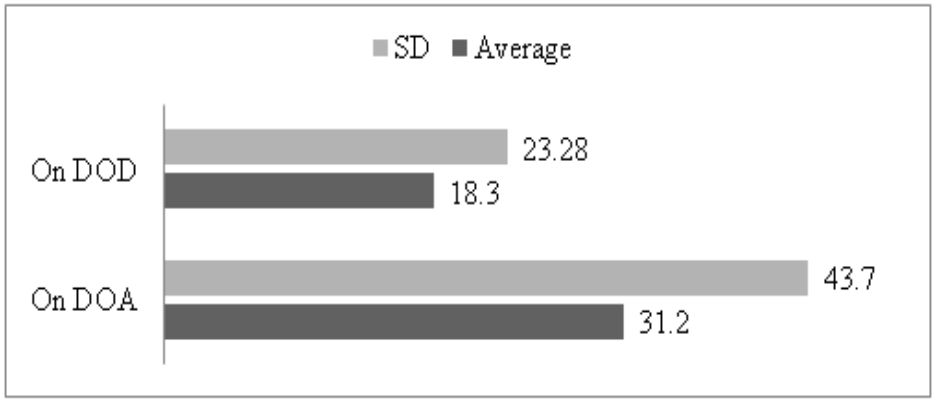

Fig 18: IL-6 monitoring

The average value of IL-6 on the date of admission was 31.2(SD ± 43.7) and the value on date of discharge was 18.3(SD ± 23.28) both were not in the normal range and it was showing that the values are reaching towards the normal range after taking cocktail. IL-6 is the biomarkers fir Indicating inflammation thought it didn't come to normal range but the decrease after treatment can be seen.

D-DIMER: Normal Range: <500ngFEU/ml

Table no 18: D-Dimer levels monitoring

	Average	SD
On DOA	1064.1	2385.8
On DOD	399.8	352.9

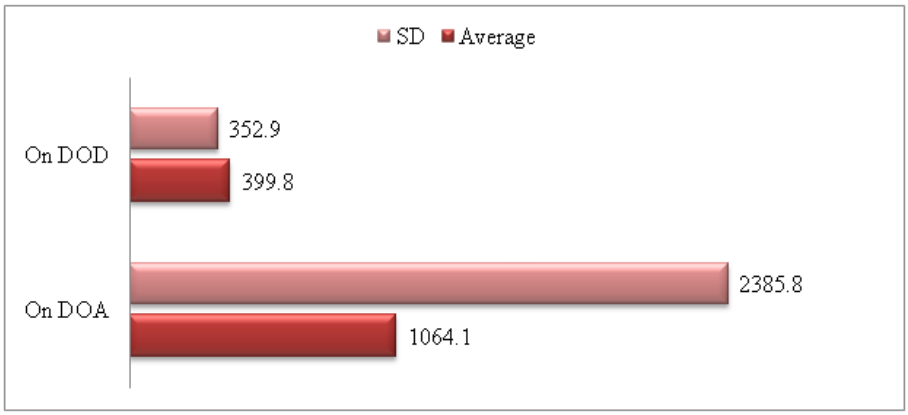

Fig 19: D-Dimer levels monitoring

The graph shows that the average value of D-Dimer on the date of admission was 1064.1 (SD ± 2385.8) which is a drastic deviation from the normal range and it reaches to normal after the administration of cocktail at the date of discharge i.e., 399.8(SD ± 352.9). D-dimer has a drastic elevation when the Covid started in a patient but the decrease is seen after cocktail monoclonal antibodies therapy indicating no coagulation occurred after therapy that may lead to Cytokine Strome.

LDH:

Normal Range: 250 IU/L

Table No 19: LDH monitoring

	Average	SD
On DOA	243	61.23
On DOD	106.5	43.4

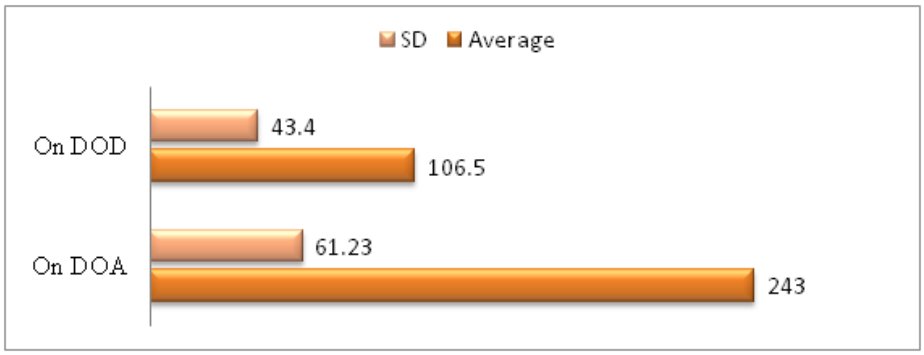

Fig 20: LDH levels monitoring

The above diagram shows that the LDH value on the date of admission was 243 (SD± 61.23) and it was 106.5(SD ± 43.4) on the date of discharge and those both values are within the normal range LDH is the lactate dehydrogenase had decreased in the patients and is normal after treatment as it may Leads to hemolysis.

C - reactive protein: Normal Range: <5mg/dl

Table 20:CRP monitoring

	Average	SD
On DOA	22.3	26.47
On DOD	13.9	27.87

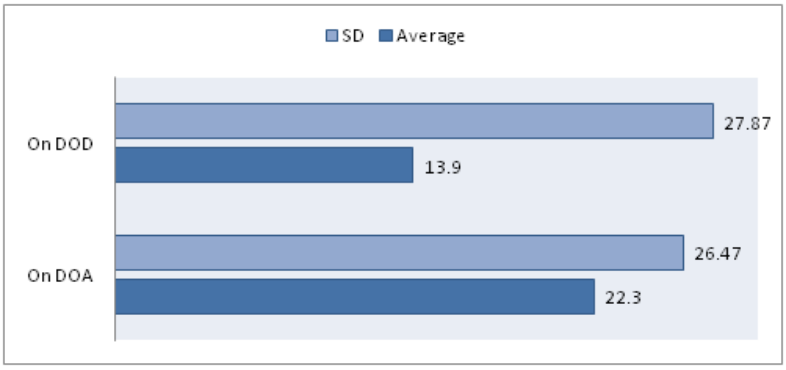

Fig 21: CRP levels monitoring

The graphical representation above states that the average value of CRP on the date of admission was 22.3(SD ± 26.47) whereas 13.9(SD ± 27.87)on the date of discharge. Both the values are not in normal range but the average value at the date of discharge tends towards normal range. CRP is the indicator for the inflammation and infection and that indicates the increase levels before treatment and lowers after treatment.

Other medications given:

From the study it was found that most of the other medications given were antibiotics and steroids.The main rationality of giving these drugs is to prevent and treat secondary infections. From the 42 enrolled subjects 22 have taken ceftriaxone, 19 patients took doxycycline and other antibiotics like azithromycin was taken by 2 patients, cefuroxime by 3 patients, cefuroxime + sulbactam by 1 patient, cefaparazone+sulbactam by 6 patients, metronidazole by 2 patients, ceftaxime by 1 patient and cefpodoxime by 1 patient.8 patients from 42 enrolled were given steroids as treatment in which 4 patients were given prednisolone ,3 patients took budesonide, 1 patient was treated with hydrocortisone and 1 patient with budesonide + salbutamol.

Death analysis:

- 6 out of 42 patients have undergone deaths in the follow up
- The death subjects were between age of 50-80

  0-1st month there are

- 2 deaths in hospital + 2 deaths after discharge =total 4
  1^{st} – 2^{nd} months
- 1 death after discharge = Total 1
  2^{nd} – 3^{rd} months
- 1 death after discharge = Total 1

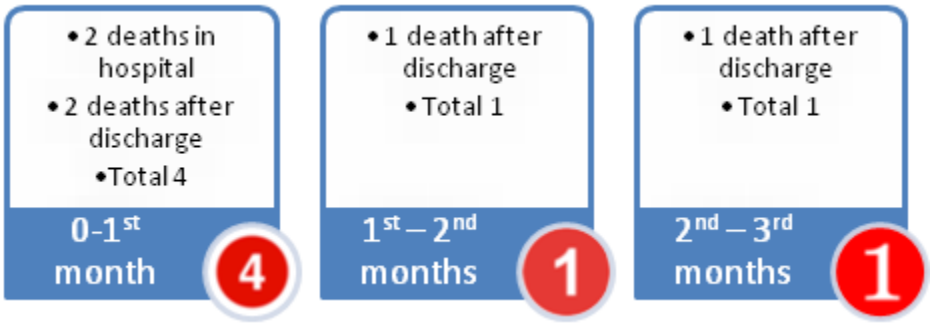

Fig 22: No. of deaths during cocktail treatment

Table 21: Types of comorbidities wise distribution

Type of comorbid	No.of patients
Cardiac	2
Neurological	3
kidney diseases	4
HTN	4
DM	4
respiratory diseases	1
liver diseases	1
Cancer	1
Orthopaedics	1

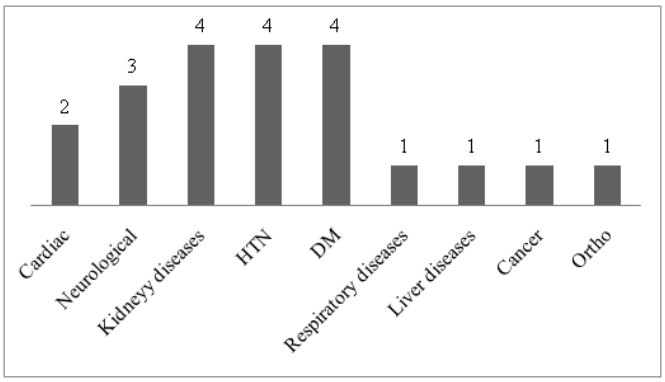

Fig23: Type of comorbid wise distribution

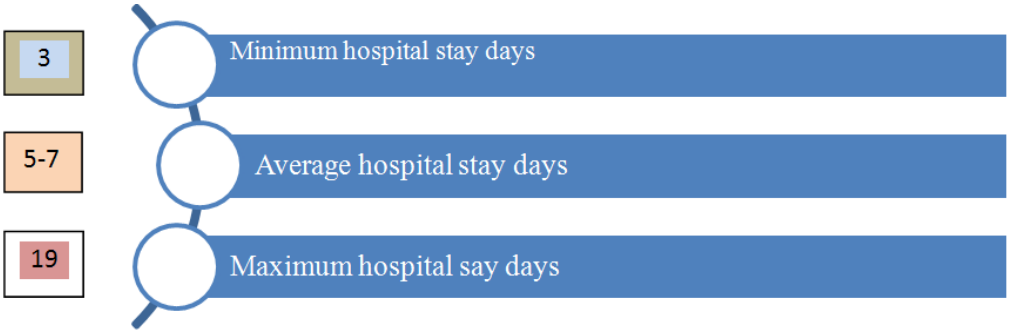

Fig 24: Hospitalized days

All the 6 death subjects possess the following multiple comorbid conditions like In death subjects 2 patients with cardiac diseases, 3 with neurological diseases, 4 with kidney diseases, 4 with HTN, 4 with DM, 1 with respiratory disease, 1 with Liver disease, 1 with cancer and 1 with orthopaedic problems. Out of 6 death all are administered with cocktail monoclonal antibodies among them 1 subject also took remdesivir along with cocktail

- 3 are minimum hospital stay days
- 11 are maximum hospital stay

Table 22: No.of Comorbiditieswise distribution

	No of comorbidities in death subjects
1 comorbidities	0
2 comorbidities	1
3 comorbidities	0
4 comorbidities	2
5 comorbidities	1
6 comorbidities	1
7 comorbidities	1

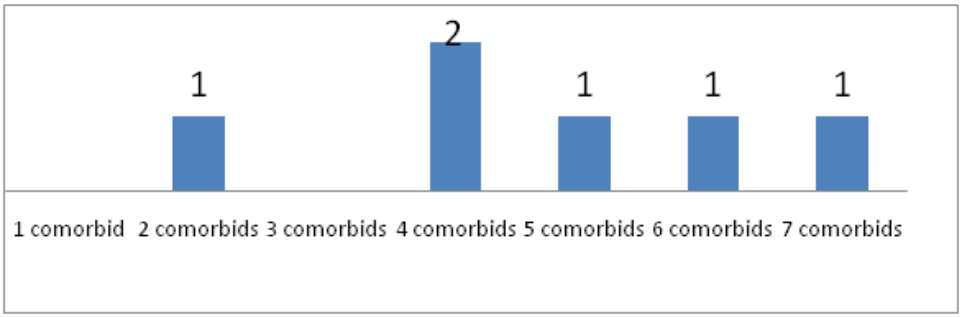

Fig 25: No.of comorbidities wise distribution

There is 1 patient with 1 comorbidity, 2 patients with 4 comorbidities, 1 patient with 5 comorbidities, 1 patient with 6 comorbidities and 1 patient with 7 comorbidities.

Discussion

The prospective observational study was conducted on monoclonal antibodies i.e. Casirivimab Imdevimab the novel treatment for covid-19. The infusion of 120 mg/ml is titrated with 100 ml of normal saline and is infused in a half an hour duration of time. The drug was given to patients in the omicron variant. It is a single centre study in a tertiary care hospital from January 2022- April 2022 42 individuals have enrolled in our study the demographics of patients including 22 (52%) male and 20(48%) females with a age group of 15-95 years the mean age group is 36-75 years where 32 individuals have been infected and tested RTPCR +ve mostly the comorbiditiesvary from 1-8 diseases people with no comorbidities, 1,2,3,4,5 were most population involved in study. More prevalent comorbidities are HTN, DM, CAD, CKD, endocrine and neurological related diseases Vaccination include majority with Covishield then Covaxin.

The hospital stay is mostly between 2-5 days. Spo2 levels were decreased during admission and increased during discharge following respiratory rate causing hyperventilation association with covid during admission and normalised on discharge. The study population involved 59% HTN 62% DM. 21% thyroid 38% with cardiac 16% with neurology and 14% with nephrology remaining covers ophthalmology, pulmonology, dermatology, hepatology and orthopaedic problems. The primary objective of the study is to know post therapeutic effects and we're assessed as like increase in SpO2 & RR.

The other was to find all the complications association with treatment like fever, cold& cough. The secondary objective of study is assessing hemodynamic changes of pre and post Covid therapy with cocktail monoclonal antibodies. The concomitant drugs given are mostly antibiotics like ceftriaxone, doxycycline, azithromycin, cefuroxime, cefuroxime + sulbactum, cefaparazone+sulbactum, metronidazole, ceftaxime and cefpodoxime. Steroids like prednisolone, budesonide, hydrocortisone budesonide + salbutamol were given to patients.[44]

Casirivimab – Imdevimab treatment is associated with reduced rates of hospitalization among high risk patients in mild- moderate COVID-19 patients December–April between 2022-0221 in his study stated that treating Covid patients with cocktail monoclonal antibodies decrease the hospital stay when compared to control group in high risk patients like hypertension, body mass index , diabetes mellitus , chronic lung disease , chronic renal disease , congestive heart failure , and compromised immune function. our study also states that people with high risk population irrespective of more comorbids and end stage diseases patients had discharged safely with less hospital

stay.[45] REGN CoV2, a neutralizing antibody cocktail, in op patients with COVID-19 conducted a trial stated in his study that 3 different groups were taken 1 is placebo control: 2 is Casirivimab and Imdevimab 2.5g 3rd group is Casirivimab, Imdevimab8.0g In this interim analysis antibody cocktail reduced viral load, with a greater effect in patients whose immune response had not yet been initiated or who had a high viral load at baseline. Safety outcomes were similar in the combined REGN-COV2 dose groups and the placebo group. The safety outcomes in our 3 months follow up study had mild- moderate adverse drug reaction like cough, cold, and fever which decreased slowly and came to null in some patients after 3rd month follow up.

[46] has conducted a study REGN-CoV 2 antibody cocktail in patients with SARS-Cov-2 an observational study in between July–September year 2021 108 patients and reported no adverse effects also safe and beneficial to patient who were treated with cocktail monoclonal antibodies. The cocktail is safe and beneficial to patient by soon recovery and less hospital sty decreasing financial burden but possess some adverse drug reactions in follow-up. Some of our study subjects had administered both with cocktail and Remdesivir [47] has conducted a study on the impact ofCasirivimab and Imdevimab antibody cocktail in patients amidst and post covid 19 treatment and it's a retro prospective comparative study in year 2021 between may - Octoberstated about the lesser requisite for mechanical ventilation , high flow oxygen and no death during Casirivimab and Imdevimab therapy. Meanwhile, non-vaccinated test groups were not on mechanical ventilation and those fully immunized seldom entailed high flow oxygen in our study its 6% improvement in the spo2 levels were seen and patient admitted with hyperventilation were normalized after administration of Casirivimab and Imdevimab that indicates the efficacy of cocktail irrespective of their comorbidities.

[48] This study was conducted on haemoglobin anaemia in COVID-19 patients in year 2020 in north Spain Stated at admission mean Hb was normal, s-ferritin median was elevated, all acute phase reactants had raised values. Hb showed a slow and progressive decrease in patients during admission, more marked in patients with severe symptoms and days warded. In our study Hb was decreased on admission and increased on discharge. Also the other parameters were also evaluated like TLC, platelets, IL-6, D-dimer, CRP ware increased on admission and decreased on discharge Interpreting cocktail increases the antibodies and minimise the covid related symptoms.[49]

A serum LDH levels as a prognostic factor for COVID-19 a retrospective study conducted between February 2020 - march 2020 in their article stated that in covid patients the death subjects possess high LDH levels. In conclusion of the study, we got an interpretation that LDH levels are in between the normal range but got decreased from 243(SD±16.2) to 106.5(SD±43.4) after treating with cocktail.

4. Conclusion

According to the statistics, men make up the majority and those over the mid-age group drank cocktails. For most patients, the vaccine that is administered is Covishield. There are more people with 0–6 comorbidities. The most common comorbidities are thyroid, CAD, DM, HTN, and MI. A hospital stay must last at least two to five days. The maximum number of subjects underwent RTPCR as a confirmatory test; the results showed a 6% improvement in oxygen saturation and a return to normal respiratory rate following hyperventilation. After receiving a combination of treatments for COVID-related inflammation and infection, the following parameters returned to normal: Hb, TLC, IL-6, D-dimer, LDH, and CRP. Other drugs, such as steroids and antibiotics, are provided after discharge. Remdesivir and a cocktail are given to some. Remdesivir and a cocktail are given to some. Based on HRCT and CT severity scores, most patients had mild-to-moderate COVID-19. Six of the 42 recruited patients passed away, and end-stage and chronic illnesses such cancer, CKD, DLD, HTN, and DM were the cause of death. Less time was required for the minimal hospital stay than for the patients who were still alive.

5. Bibliography

[1] Zhou P, Yang XL, Wang XG, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. Nature. 2020;579(7798):270–273.

[2] Wu F, Zhao S, Yu B, et al. A new coronavirus associated with human respiratory disease in China. Nature. 2020; 579(7798):265–269.

[3] World Health Organization Coronavirus Disease 2019 (COVID-19) Situation Report-97. Available from:https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200426-sitrep-97-covid-19.pdf

[4] Wang C, Horby PW, Hayden FG, et al. A novel coronavirus outbreak of global health concern. Lancet. 2020;395(10223):470–473.

[5] Azhar EI, Hui DSC, Memish ZA, et al. The Middle East respiratory syndrome (MERS). Infect Dis Clin North Am. 2019;33(4):891–905.

[6] Corman VM, Muth D, Niemeyer D, et al. Hosts and sources of endemic human coronaviruses. Adv Virus Res. 2018;100:163–188. [Crossref], [PubMed], [Web of Science ®], [Google Scholar]

[7] Andersen KG, Rambaut A, Lipkin WI, et al. The proximal origin of SARS-CoV-2. Nat Med. 2020;26:450–452.

[8] Almazán F, Sola I, Zuñiga S, et al. Coronavirus reverse genetic systems: infectious clones and replicons. Virus Res. 2014;189:262–270.

[9] Nao N, Yamagishi J, Miyamoto H, et al. Genetic predisposition to acquire a polybasic cleavage site for highly pathogenic avian influenza virus hemagglutinin. mBio. 2017;8(1):e02298.

[10] Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020;395(10223):497–506.

[11] Zhu N ,Zhang D ,Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med. 2020;382(8):727–733.

[12] Long B, Brady WJ, Koyfman A, et al. Cardiovascular complications in COVID-19. Am J Emerg Med. 2020.

[13] Leung NHL, Chu DKW, Shiu EYC, et al. Respiratory virus shedding in exhaled breath and efficacy of face masks. Nature Med. 2020;26(5):676–680.

[14] Núñez-Delgado A. What do we know about the SARS-CoV-2 coronavirus in the environment? Sci Total Environ. 2020;727:138647.

[15] European Centre for Disease Prevention and Control. Algorithm for the management of contacts of probable or confirmed COVID-19 cases. [cited 2020 Feb 25]. Available from: https://www.ecdc.europa.eu/en/publications-data/algorithm-management-contacts-probableor-confirmed-covid-19-cases.

[16] https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(21)00382-5/fulltext

[17] Hui DSC, Zumla A. Severe acute respiratory syndrome: historical, epidemiologic, and clinical features. Infect Dis Clin North Am. 2019;33(4):869–889.