



A STUDY ON THE MANAGEMENT OF KIDNEY DISEASE ASSOCIATED WITH COVID-19 IN A TERTIARY CARE HOSPITAL

Thahaniya Salim K P^{1*}, Sneha P V¹, Muhammed Fazil A C¹, Afrah C M¹, Soumya M K²

¹PharmD Interns, Crescent College of Pharmaceutical Sciences, Kannur, Kerala

²Associate Professor, Crescent College of Pharmaceutical Sciences, Kannur, Kerala

ABSTRACT:

Aim: To study the management of Kidney-disease associated with COVID-19 in patients admitted to the department of nephrology in a tertiary care hospital.

Methodology: A prospective observational study was conducted over 6 months among 102 patients.

Materials and Methods: All the data are collected, entered, and documented into the Excel sheet based on the protocol. The collected data was Statistically Analysed using Microsoft Excel and SPSS software.

Results: Out of 102 population diagnosed with kidney disease with COVID-19, the majority of the patients were male, the study contains 67% of male patients. Disease conditions were commonly seen among the age group of 51-70 years. Major co-morbidities associated were hypertension. Patients suffered most commonly from fever. In our study, most of the Kidney patients had the mild category of COVID-19 which is Category C of COVID-19. We also did a study comparing oxygen saturation level with that of respiratory rate in patients with COVID 19 and mortality rate was found more among patients with decreased oxygen level and increased respiratory rate. Among the admitted patients, the majority of them belonged to stage 5 of CKD. Stage determination of CKD was done on the basis of calculated GFR value. The majority of patients fall under the GFR category of less than 15 ml/min. As patients were suffering from kidney disease dialysis was done, most commonly with the frequency of 3 times a week with a duration of 4 hours.

Different categories of drugs like Vitamin supplements, Antibiotics, Antivirals, Corticosteroids, Erythropoiesis stimulating agents, Iron supplements, Anticoagulants, Diuretics, Inotropes, and Monoclonal antibodies were prescribed in our study, out of which Vitamin supplements were given the most among the 102 hospitalized patients.

Among Vitamin supplements, Vitamin B Complex with Vitamin B 12, Penicillin and beta-lactamase inhibitors Piperacillin and Tazobactam among antibiotics, Ritonavir among antivirals, Regular heparin among anticoagulants, Iron sucrose among Iron supplements, Methylprednisolone among Corticosteroids, Torsemide among diuretics, Erythropoietin among Erythropoiesis Stimulating Agents, Adrenaline among Inotropes, Casirivimab + Imdevimab among Monoclonal Antibody

Supportive care like Oxygen support, ICU, mechanical ventilation, and NIV was given. Most of the patients required oxygen support. During hospitalization, 27 out of 102 patients were dead.

Conclusion: The emergence of COVID-19 required the emergency attention of the healthcare system as the etiology and pathophysiology of the disease were unknown at the beginning. All the initial steps of therapy and supportive care given in our study evaluated that it reduced hospitalization and mortality rate among the patients.

Keywords: Kidney disease associated with COVID-19 Management, Age wise distribution, GFR less than 15 ml/min, Kidney disease stage, Dialysis frequency, Oxygen saturation, respiratory rate prediction in COVID-19, Supportive cares given, Mortality rate.

1. INTRODUCTION:

Nephropathy, also known as kidney disease or renal disease, is a condition that affects the kidney's ability to filter blood properly. The kidneys are two bean-shaped organs that make up our organ system. The function of the kidneys is to produce urine and filter excess water and waste from the blood. Acute and chronic renal disorders are the two most prevalent kidney conditions.^[1]

CKD is characterized by renal disease or illness that lasts for longer than three months. People with CKD are more likely to be over 65 years (38%) than between 45 and 64 years (12%) or between 18 and 44 years (6%). Women are slightly more likely than men to have CKD (14% vs. 12%).^[2] Acute kidney failure (AKF), also known as acute kidney disease (AKD), usually manifests itself within a short period of time. Kidney disease or condition must have occurred for less than three months or less in order to be considered to have AKD.^[3]

Glomerular filtration rate helps to find the type and severity of kidney disease. Five stages of chronic kidney disease are • Stage 1: GFR greater than 90 mL/min/1.73 m² with kidney damage • Stage 2: GFR is only slightly reduced (60–89 mL/min/1.73 m²) • Stage 3a: GFR decline of moderate severity (45–59 mL/min/1.73 m²) • Stage 3b: GFR decline of a moderate nature (30–44 mL/min/1.73 m²) • Stage 4: GFR severely reduced (15–29 mL/min/1.73 m²) • Stage 5: Failure of the kidneys (GFR <15 mL/min/1.73 m²). With stage 5 or end-stage kidney disease (ESKD), dialysis is necessary. The severity of the disease and GFR level determine the frequency and length of dialysis.^[4]

The SARS CoV-2 virus is the infectious agent that causes coronavirus illness (COVID-19). The majority of those who contract this virus will suffer from mild to moderate respiratory disease. COVID-19 was categorized into three groups based on its severity: Category A (high risk), Category B (moderate risk), and Category C. (mild risk). However, some people, particularly those who are older and who also have additional medical conditions including cancer, diabetes, cardiovascular disease, and kidney disease, will get extremely unwell and need medical care.^[6] The kidneys may be affected by COVID-19 along with other organ systems. More severe COVID-19 illnesses appear to be more common in older adults (over 65) and those with kidney disease or other major medical disorders. The novel coronavirus can adhere to kidney cells via their receptors, infiltrate, and replicate, potentially causing tissue damage. Another theory is that excessively low oxygen levels in the blood may be the cause of renal issues in coronavirus patients. Hospitalization is more likely for patients with COVID-19 and kidney illness, namely ESKD, than it is for people without kidney disease.^[7]

COVID-19 has presented daunting challenges for the care of people with pre-existing kidney disease, especially those who need specialized care such as dialysis or kidney transplantation.^[8]

While initial reports did not report significant effects on the kidneys, it is now well established that kidney involvement (acute kidney injury, urinary abnormalities, Tubular function defects) in COVID-19 is common and it is also associated with poorer outcomes. At the same time, care for patients with existing chronic kidney disease (CKD) has suffered during this pandemic and those with CKD are considered to have a higher risk for the severity of COVID-19 symptoms and increased hospitalization in such patients, the risk of mortality was also high among such patients. So it was necessary to identify the strategies to prevent COVID-19 infections among patients with CKD.^[9]

Patients who have COVID-19 become reliant on general and supportive therapy, such as oxygen delivery, broad-spectrum antiviral drugs, and glucocorticoids. The most recent recommendation for the treatment of COVID-19 infection uses the approved anti-HIV medicine lopinavir/ritonavir, remdesvir, but only for patients with eGFR values greater than 30 ml/min.^[10]

Antiviral drugs, antibiotics, and glucocorticoids were the three most frequently prescribed medications during hospitalization for COVID-19 patients. The percentage of patients with acute kidney injury who received treatment with antiviral and glucocorticoids was also significantly higher but dosage adjustment was required among chronic kidney disease patients. The percentage of drugs grew over the course of the hospital stay, especially for antivirals, diuretics, and glucocorticoids.^[11]

2. METHODOLOGY:

Study design: A Prospective observational study.

Study site: The Study was conducted at the inpatient Department of Nephrology at a 500 bedded tertiary care Hospital, in Kannur, Kerala.

Study material: Case reports of admitted patients.

Study duration: The study duration was 6 months from January 2022 – June 2022.

Study population: Patients having Kidney disease positive with COVID-19 admitted under Nephrology Department in a tertiary care hospital, in Kannur, Kerala.

Sample size: 102 Patients.

Sample variables: Patient demographic details like age, gender, presenting complaints, diagnosis, social habits, family history, co-morbidities, treatment chart, laboratory parameters, COVID-19 category, dialysis frequency, and duration were included.

Study procedure: Detailed information regarding the study was given to the patient. Informed consent from the patient was obtained. A data collection form having required data for study purposes was created. All the information of the patient like age, sex, admission complaints, diagnosis, occupational status, risk factors, social history, family history, and treatment charts were collected from the patient medication profile and documented. The Patient's Creatinine clearance (Crcl) and eGFR values were calculated to find the stage of kidney disease. The Patient's name was excluded from the case report to protect the confidentiality of the patient.

Ethics and consent: The study was approved by the Institutional Human Ethical Committee of Crescent College of Pharmaceutical Sciences filed under 003/2021/CCOPS/IEC. Permission to conduct the study was obtained from the chairperson of the Institutional Human Ethics Committee.

3. RESULTS:

The duration of the study was 6 months and all the data were collected from the department of Nephrology, in a Tertiary care hospital, in Kannur, Kerala. A total of 102 patients were included satisfying the inclusion and exclusion criteria of the study.

3.1 GENDER WISE DISTRIBUTION

Out of 102 hospitalized patients; 68 (66.6%) of them were male and 34 (33.3%) of them were female. The incidence of COVID-19 with kidney disease condition was found more among males than females.

3.2 AGE WISE DISTRIBUTION

Among 102 patients admitted, 8 patients between the age category of 30-40 years had the disease distribution of 7.8%, whereas 7 patients of age category 41-50 had 6.9% and 32 patients above 70 years had 31.4% respectively, and among all the 55 patients between 50-70 years had the distribution of about 53.9%, which concludes them to be the more susceptible age category of renal disease amid COVID-19.

3.3 CO-MORBIDITIES

The most common co-morbidities out of 102 COVID-19 patients having kidney disease were Hypertension 73 (71.5%).

Table 1: Distribution of sample according to Co-morbidities

CO-MORBIDITIES	PATIENTS	PERCENTAGE
CVA	11	10.7%
CAD	42	41.1%
Type 2 DM	65	63.7%
Thyroid Disease	13	12.7%
Hypertension	73	71.5%
Dyslipidemia	12	11.7%
COPD	26	25.4%

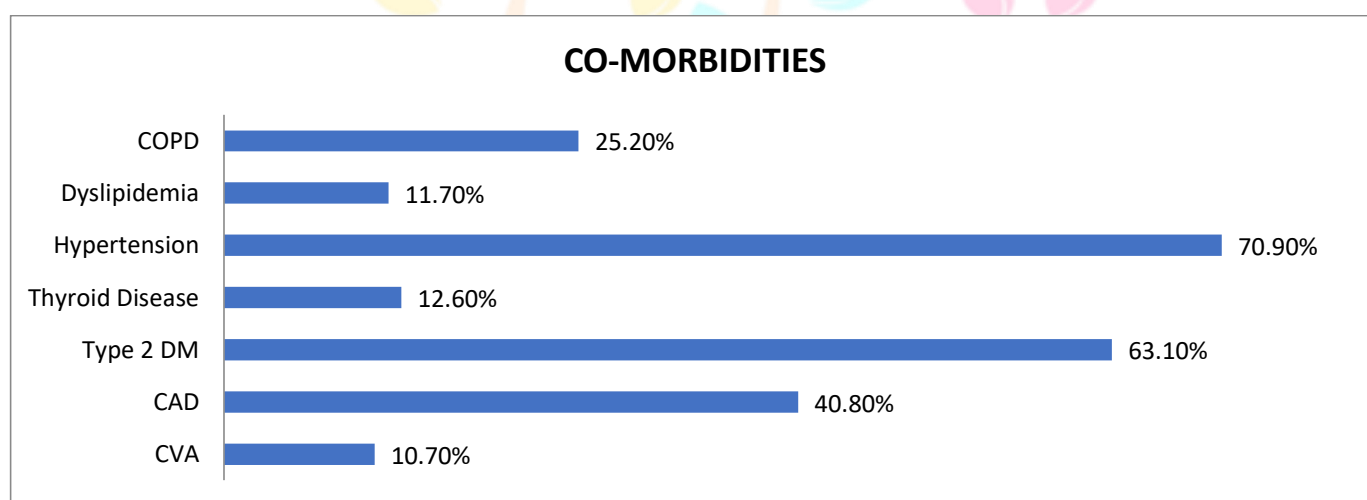


Figure 1: Distribution of sample according to Co-morbidities

3.4 SYMPTOMS

Out of 102 hospitalized Covid-19 patients with kidney disease found that the most common symptoms were fever among 74 patients (72.5%).

Table 2: Distribution of sample according to symptoms

SYMPTOMS	PATIENTS	PERCENTAGE
Chest pain	18	17.6%
Fever	74	72.5%
SOB	58	56.8%
Cough	69	67.6%
Cold	16	15.6%
Insomnia	1	0.98%
Headache	13	12.7%
Vomiting	15	14.7%
Diarrhoea	3	2.9%
Sore throat	9	8.8%
Myalgia	6	5.8%
Pulmonary oedema	60	58.8%

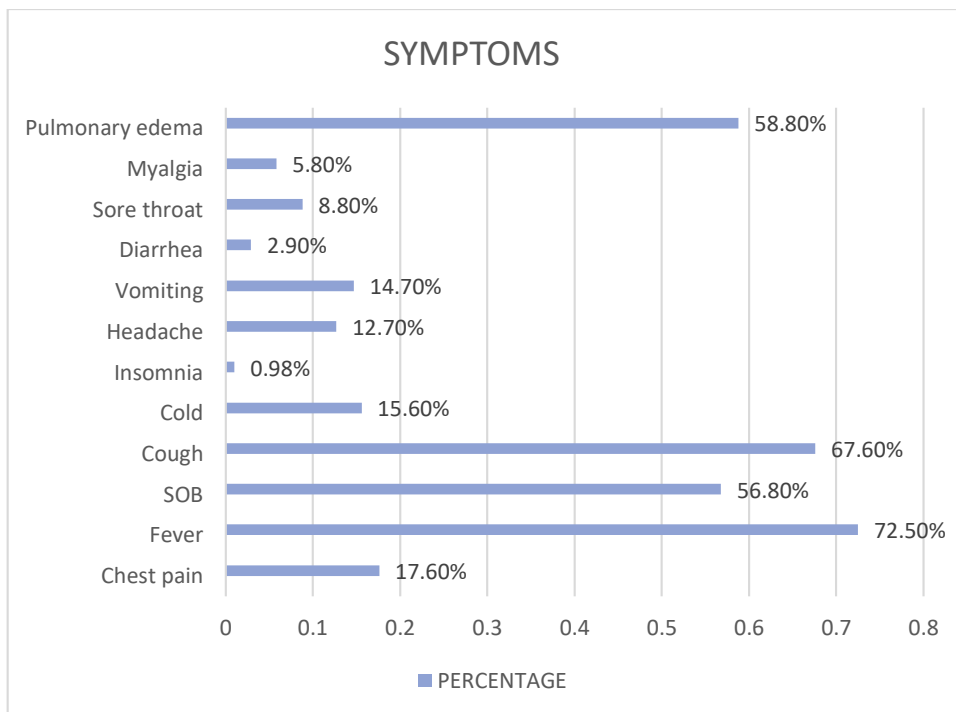


Figure 2: Distribution of sample according to symptoms

3.5 CATEGORY OF COVID-19

COVID-19 was divided into three categories based on its severity. 50 patients (49%) were under Category C (mild risk), 46 patients (45%) were under Category B (moderate risk), and 6 patients (5.8%) were under Category A (high risk). The majority of the patients were under mild risk, Category C.

Table 3: Distribution of sample according to the category of COVID-19

CATEGORY OF COVID-19	PATIENTS	PERCENTAGE
CAT-A	6	5.8%
CAT-B	46	45%
CAT-C	50	49%

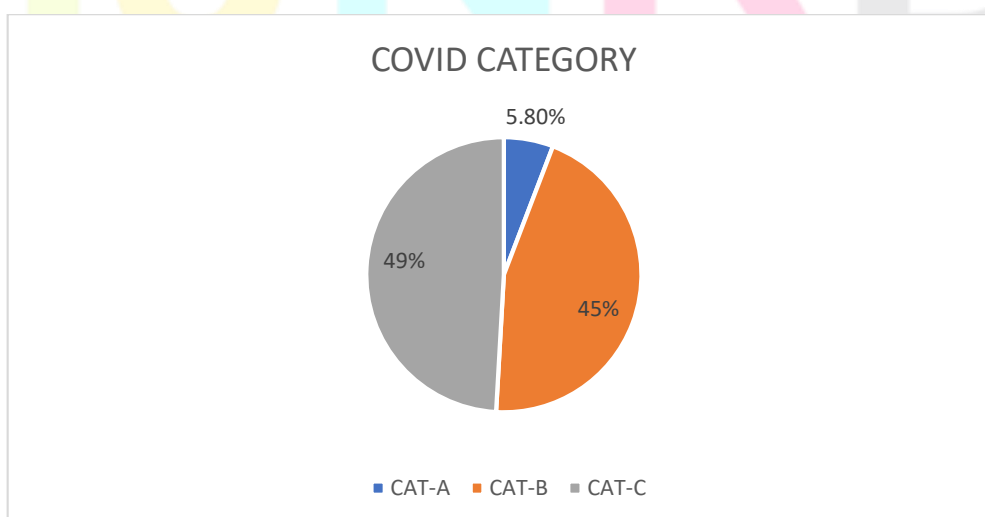


Figure 3: Distribution of sample according to category of COVID-19

3.6 OXYGEN SATURATION LEVEL, RESPIRATORY RATE PREDICTION IN COVID-19

The mean Oxygen Saturation level was found to be 95% with a mean Respiratory Rate of 25.3 bpm, among them 57% of them suffered from dyspnoea or Shortness of breath. The mortality rate was greater among patients with decreased oxygen levels and increased respiratory rate.

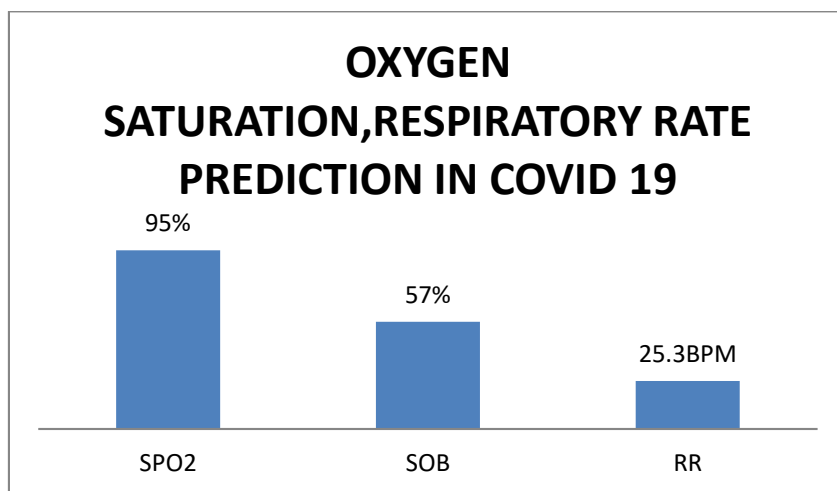


Figure 4: Distribution of sample according to oxygen saturation.

3.9 GLOMERULAR FILTRATION RATE

Glomerular filtration rate helps to find the Stage and severity of kidney disease. Among the admitted kidney-injured patients with COVID-19, most of them fall under the GFR value of less than 15ml/min, 72 patients (70.60%) belong to Stage 5 of CKD.

Table 4: Distribution of sample according to Glomerular filtration rate

GFR	NUMBER OF PATIENTS	PERCENTAGE
Less than 15	72	70.5%
15-29	13	12.7%
30-59	8	7.8%
60-89	2	1.9%
90 And above	7	6.8%

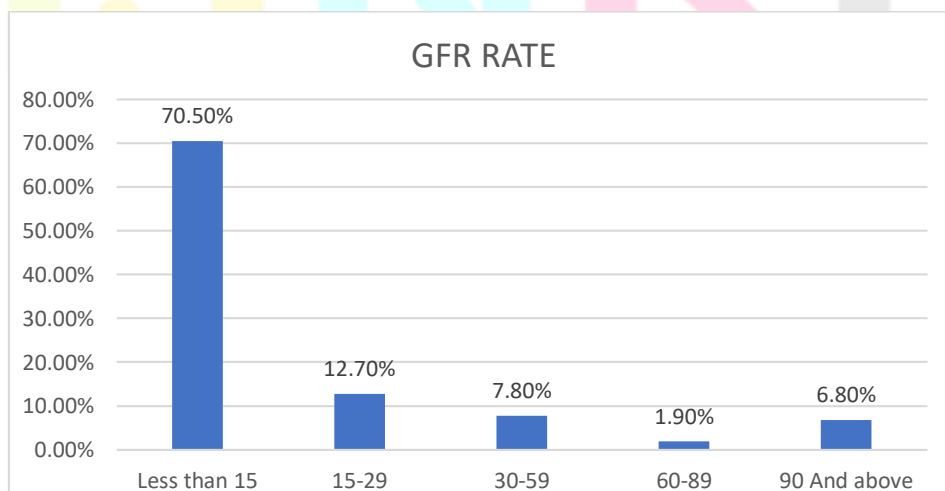


Figure 5: Distribution of sample according to Glomerular filtration rate

3.7 STAGES OF CKD

On the basis of the severity of the disease, CKD patients were categorized into 5 stages-Stage 1, Stage 2, Stage 3, Stage 4, and Stage 5. Stages were determined on the basis of calculated eGFR value. The majority of patients fall under CKD stage 5 with a frequency of 70 patients (68.6%).

Table 5: Distribution of sample according to stages of CKD

CKD STAGES	PATIENTS	PERCENTAGE
Stage 1	8	7.8%
Stage 2	3	2.9%
Stage 3	4	3.9%
Stage 4	17	16.6%
Stage 5	70	68.6%

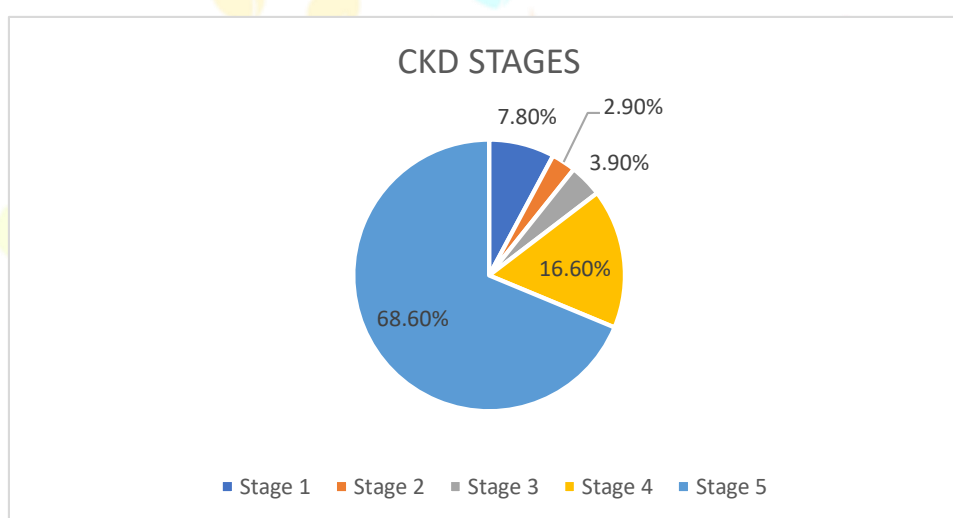


Figure 6: Distribution of sample according to stages of CKD

3.8 FREQUENCY OF DIALYSIS

The most common frequency of dialysis done in kidney-injured patients with COVID-19 were 3 times a week with a duration of 4 hours which were among 66 patients (64.7%).

Table 6: Distribution of sample according to Frequency of dialysis

DIALYSIS FREQUENCY PER WEEK	PATIENTS	PERCENTAGE
1	5	4.9%
2	14	13.7%
3	66	64.7%
4	12	11.7%
5	5	4.9%

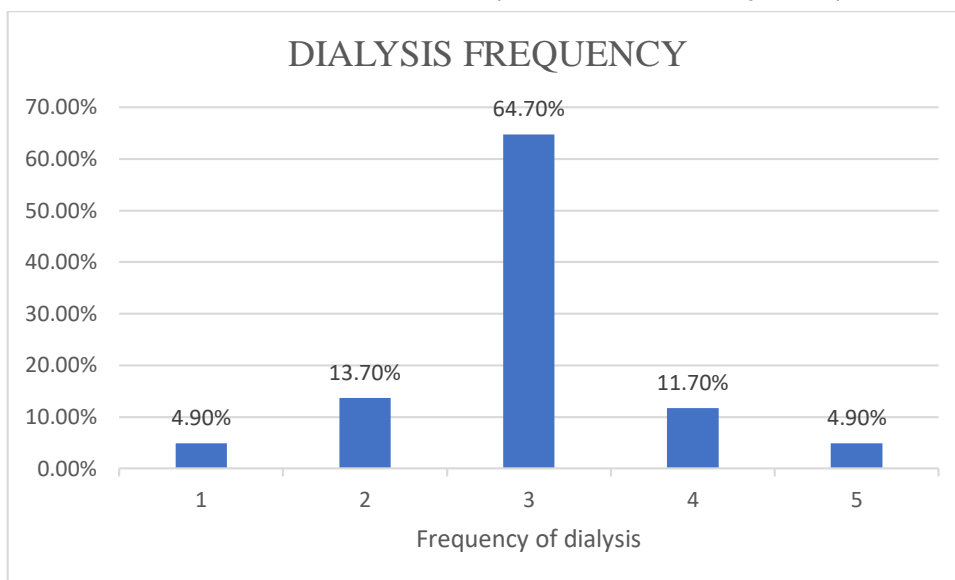


Figure 7: Distribution of sample according to Frequency of dialysis

4. MANAGEMENT OF KIDNEY DISEASE ASSOCIATED WITH COVID-19:

CATEGORIZATION OF DRUGS USED IN THE MANAGEMENT OF KIDNEY DISEASE ASSOCIATED WITH COVID 19:

Drugs prescribed for managing Kidney disease associated with COVID-19 were; Vitamin supplements, Antibiotics, Antivirals, Corticosteroids, Erythropoiesis Stimulating Agents, Iron supplements, Anticoagulants, Diuretics, Inotropes, and Monoclonal Antibody.

4.1 VITAMIN SUPPLEMENTS

Out of 102 patients the most common vitamin supplements prescribed were Vitamin B complex with Vitamin B12 54 (52.9%).

Table 7: Distribution of sample according to Vitamin supplements

DRUGS	NUMBER OF DRUGS	PERCENTAGE
Vitamin B Complex with Vitamin B 12	54	52.9%
Calcium Glycinate	6	5.88%
Vitamin B Complex	19	18.62%
Vitamin C, Zinc, Vitamin D3 & Vitamin A	17	16.66%
Calcium with Vitamin D3	30	29.41%
Vitamin B Complex forte with Vitamin C	14	13.72%
Multivitamin, Multimineral with Grape seed extract capsule	4	3.92%
Cholecalciferol (Vit D3)	5	4.90%
Vitamin C	2	1.96%
Ascorbic Acid	4	3.9%
Thiamine Hydrochloride	12	11.76%
Ferric Pyrophosphate with Vitamin C, B12 & Folic acid	5	4.9%

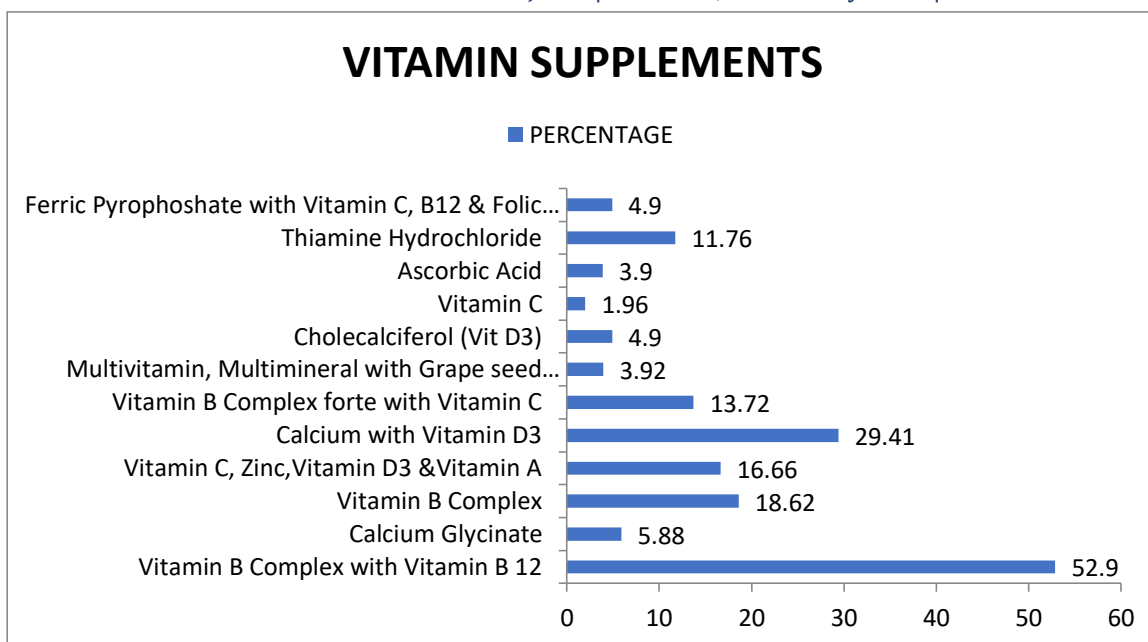


Figure 8: Distribution of sample according to Vitamin supplements

4.2 ANTIBIOTICS

Out of 102 patients the most commonly prescribed antibiotics were Piperacillin + Tazobactam in 34 patients (33.33%).

Table 8: Distribution of sample according to Antibiotics

ANTIBIOTICS	NUMBER OF DRUGS	PERCENTAGE
Piperacillin+Tazobactam	34	33.33%
Cefoperazone+Sulbactam	4	3.92%
Ciprofloxacin	4	3.92%
Cefoperazone	5	4.90%
Linezolid	23	22.5%
Ceftriaxone	20	19.6%
Amoxicillin+Potassium Clavulanate	1	0.98%
Meropenem	16	15.68%
Metronidazole	3	2.94%
Ceftriaxone+Sulbactam	2	1.96%
Levofloxacin	4	3.92%
Rifaximin	1	0.98%
Teicoplanin	1	0.98%
Azithromycin	4	3.92%

Vancomycin	8	7.84%
Gentamicin	4	3.92%
Cefixime	4	3.92%
Cefuroxime Axetil	1	0.98%
Amoxicillin	1	0.98%
Cefipime+Tazobactum	1	0.98%

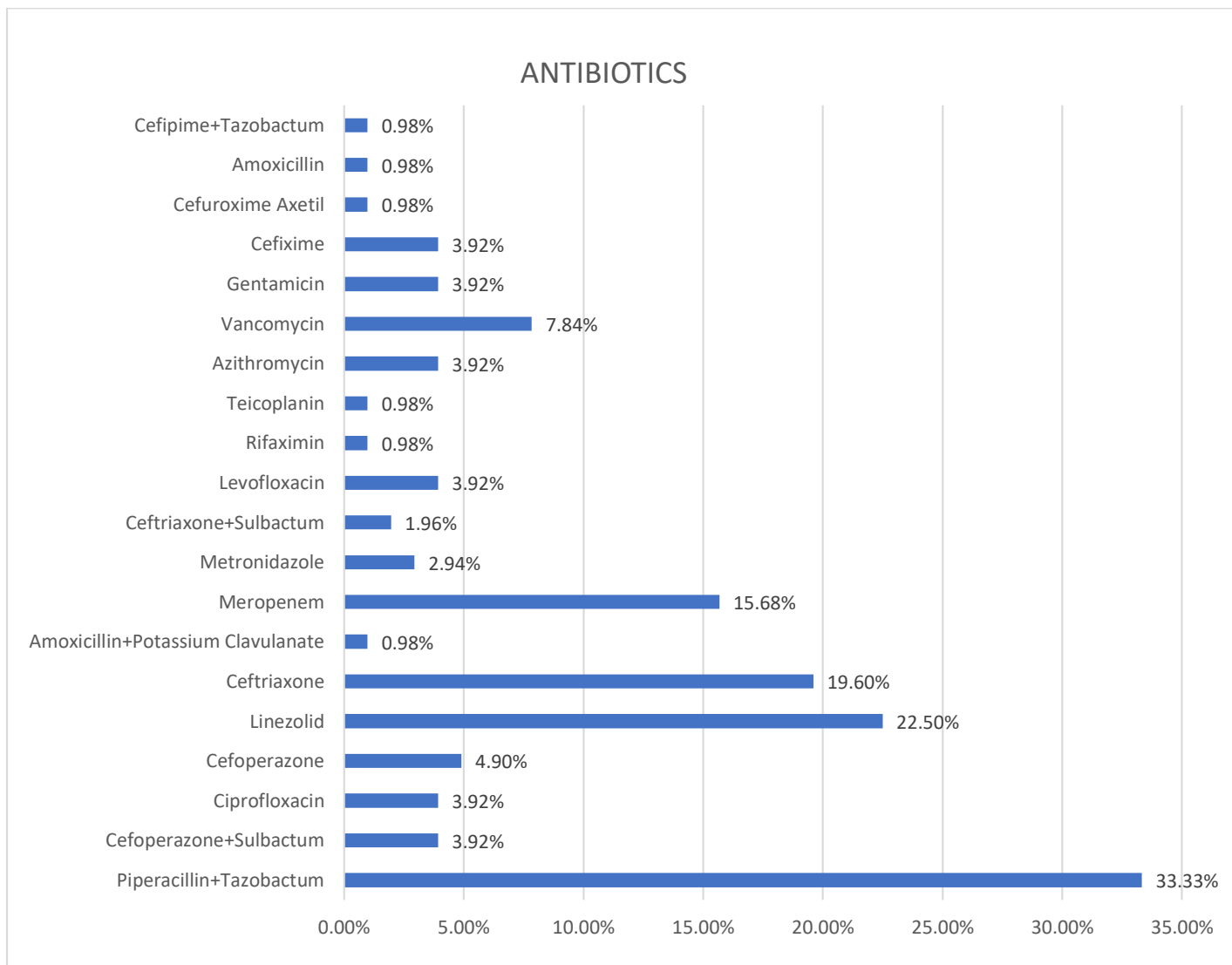


Figure 9: Distribution of sample according to Antibiotics

4.3 ANTIVIRALS

Out of the antivirals prescribed among 102 patients the most common one were found to be ritonavir 12 (11.6%).

Table 9: Distribution of sample according to Antivirals

DRUGS	PATIENTS	PERCENTAGE
Ritonavir	12	11.76%
Remdesvir	5	4.90%

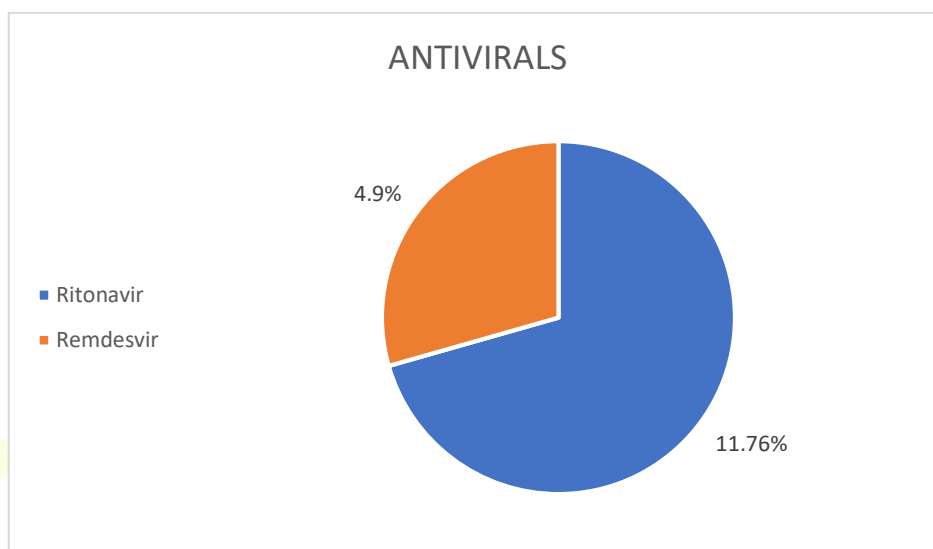


Figure 10: Distribution of sample according to Antivirals

4.4 CORTICOSTEROIDS

Out of the Corticosteroids prescribed among 102 patients the commonly prescribed one were Methylprednisolone 56 (54.9%).

Table 10: Distribution of sample according to Corticosteroids

CORTICOSTEROIDS	NUMBER OF DRUGS	PERCENTAGE
Methylprednisolone	56	54.9%
Dexamethasone	13	12.74%
Hydrocortisone	11	10.78%

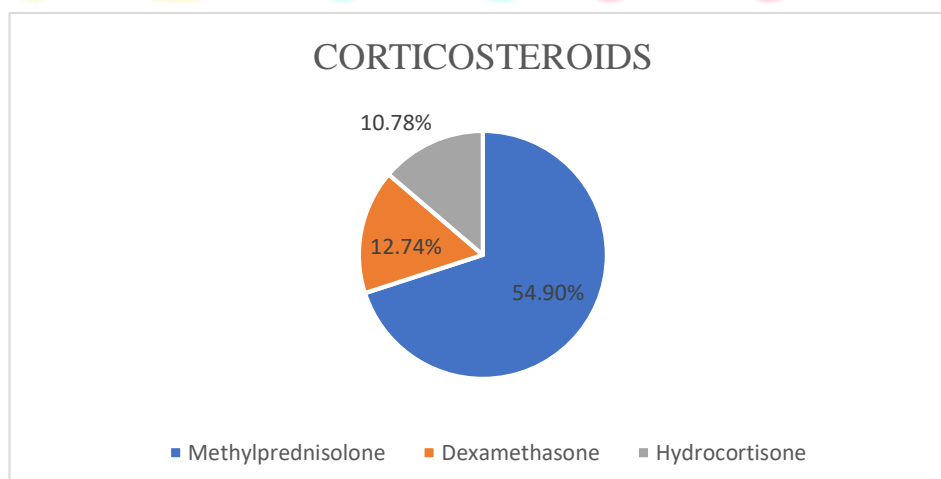


Figure 11: Distribution of sample according to Corticosteroids

4.5 ERYTHROPOESIS STIMULATING AGENTS

In our study among 102 patients the most commonly prescribed Erythropoiesis stimulating agent were Erythropoietin, 39 (38.23%).

Table 11: Distribution of sample according to Erythropoiesis stimulating agents

ERYTHROPOESIS STIMULATING AGENTS	NUMBER OF DRUGS	PERCENTAGE
Erythropoietin	39	38.23 %
Recombinant human erythropoietin	14	13.72 %

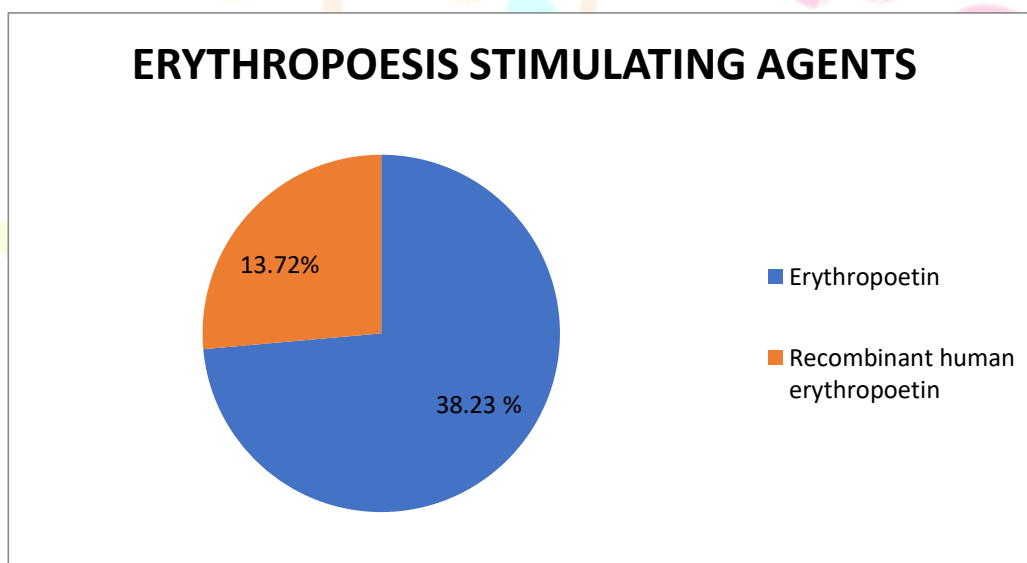


Figure 12: Distribution of sample according to Erythropoiesis stimulating agents

4.6 IRON SUPPLEMENTS

Out of the iron supplements prescribed among 102 patients in our study the most commonly prescribed were iron sucrose 39 (38.23%).

Table 12: Distribution of sample according to Iron supplements

IRON SUPPLEMENTS	NUMBER OF DRUGS	PERCENTAGE
Iron Sucrose	39	38.23%
Ferrous Fumarate +Folic acid	14	13.72%

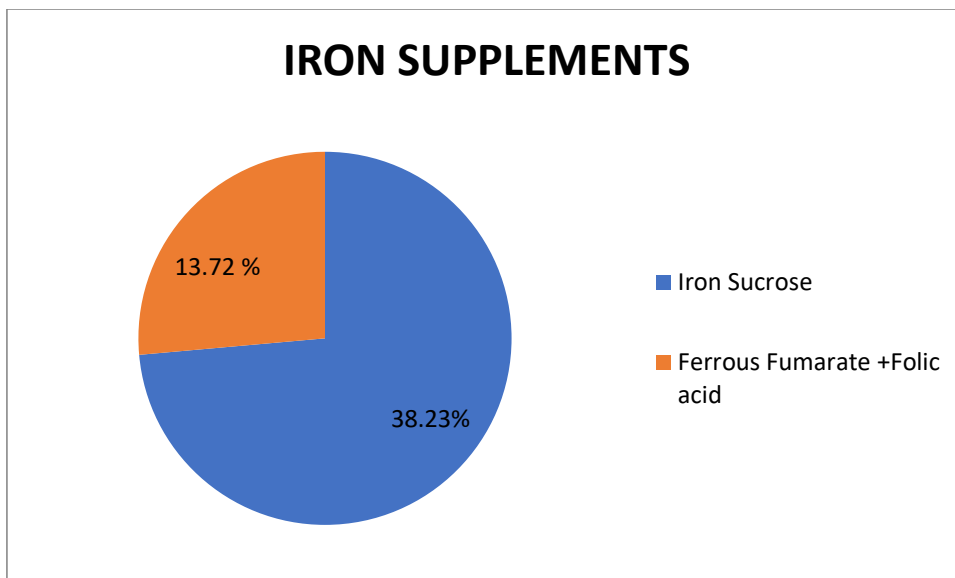


Figure 13: Distribution of sample according to Iron supplements

4.7 ANTICOAGULANTS

The commonly prescribed anticoagulants among 102 patients were regular heparin, 65 (63.72%).

Table 13: Distribution of sample according to Anticoagulants

ANTICOAGULANTS	NUMBER OF DRUGS	PERCENTAGE
Regular Heparin	65	63.72%
Enoxaparin	7	6.86%
Thromboparin	4	3.92%

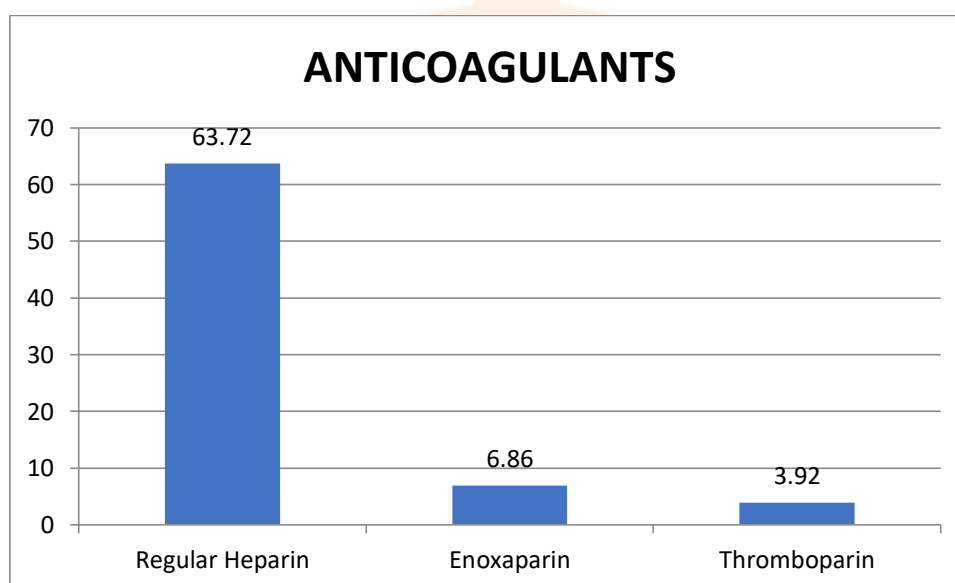


Figure 14: Distribution of sample according to Anticoagulants

4.8 DIURETICS

Out of the diuretics prescribed among 102 patients the most common one were found to be Torsemide 41 (40.19%).

Table 14: Distribution of sample according to Diuretics

DRUGS	NUMBER OF DRUGS	PERCENTAGE
Furosemide	20	19.60%
Torsemide	41	40.19%
Metolazone	9	8.82%

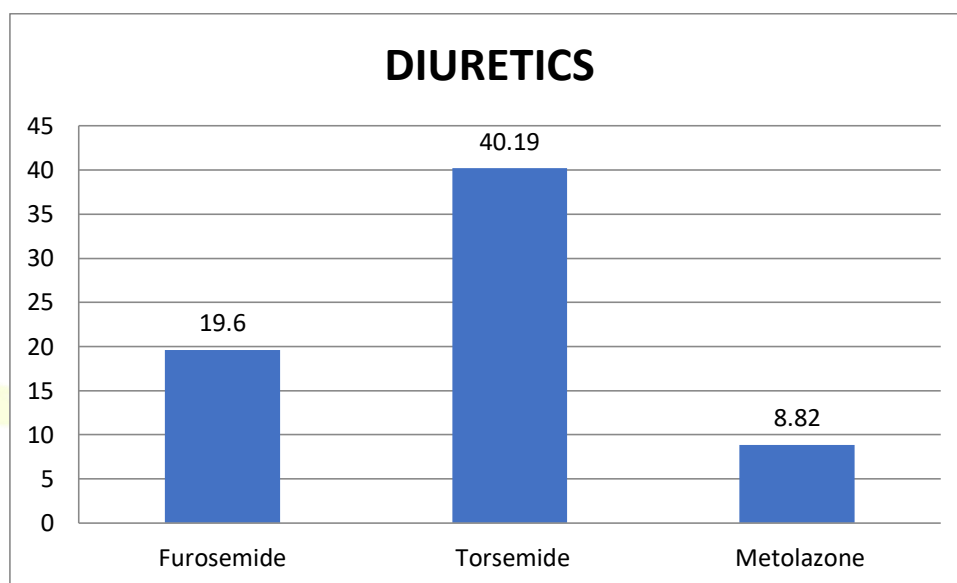


Figure 15: Distribution of sample according to Diuretics

4.9 INOTROPES

Out of the Inotropes prescribed among 102 patients the most common one were found to be Adrenaline 18 (17.6%).

Table 15: Distribution of sample according to Inotropes

INOTROPES	NUMBER OF DRUGS	PERCENTAGE
ADRENALINE	18	17.6%
NORADRENALINE	8	7.8%
ATROPINE	2	1.9%

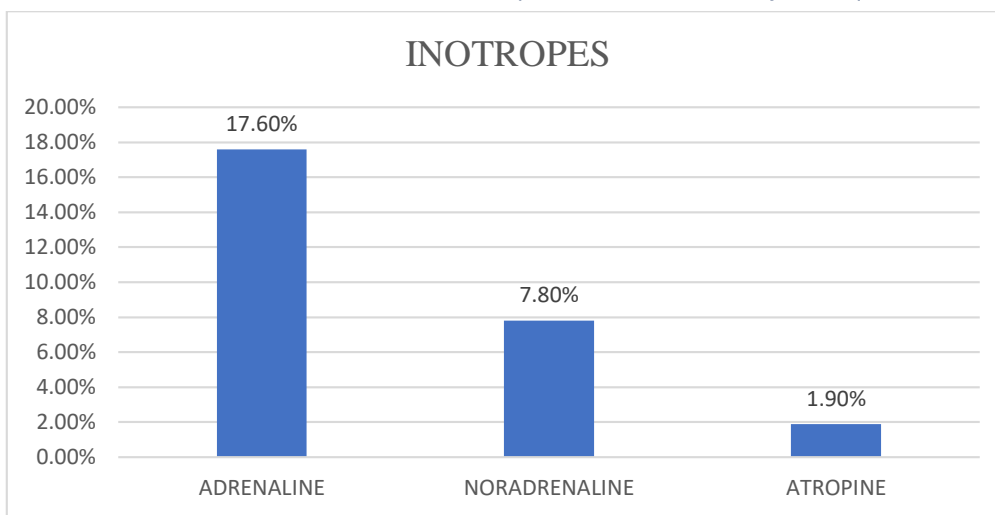


Figure 16: Distribution of sample according to Inotropes

4.10 MONOCLONAL ANTIBODY

Out of Monoclonal Antibodies prescribed among 102 patients the most commonly prescribed were Casirivimab + imdevimab 13 (12.74%).

Table 16: Distribution of sample according to Monoclonal antibody

MONOCLONAL ANTIBODY	NUMBER OF DRUGS	PERCENTAGE
Casirivimab+Imdevimab	13	12.74%
Tocilizumab	9	8.82%

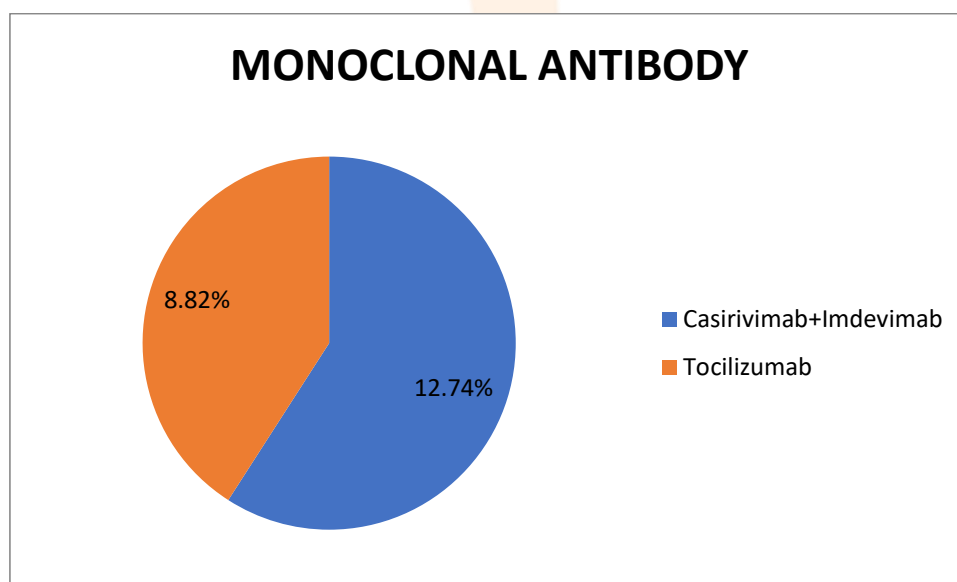


Figure 17: Distribution of sample according to Monoclonal antibody

4.11 SUPPORTIVE CARE

The most commonly utilized supportive care among 102 patients having COVID-19 with kidney disease were Oxygen support 63 (61.76%)

Table 17: Distribution of sample according to Supportive care

SUPPORTIVE CARE	PATIENTS	PERCENTAGE
Ventilator	38	37.25%
Oxygen	63	61.76%
NIV	36	35.29%
ICU	59	57.84%

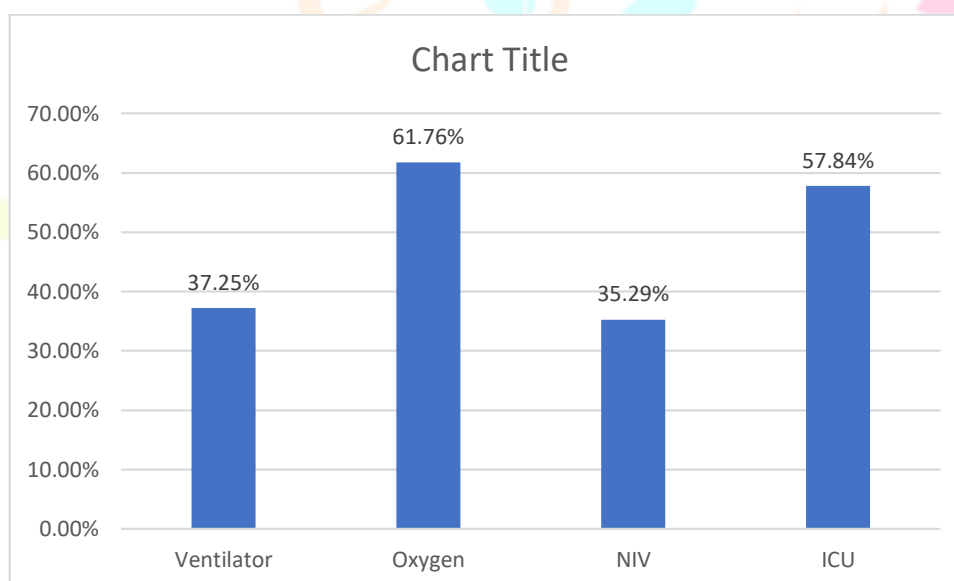


Figure 18: Distribution of sample according to Supportive care

4.12 PATIENT OUTCOME

Out of 102 admitted patients, 75 (73.5%) of them became COVID-19 negative and were discharged and 27 (26.5%) of them died or expired during hospitalization. The mortality rate was found to be 26.5%.

Table 18: Distribution of sample according to Patient outcome

OUTCOME	PATIENTS	PERCENTAGE
DISCHARGED	75	73.5%
EXPIRED	27	26.5%

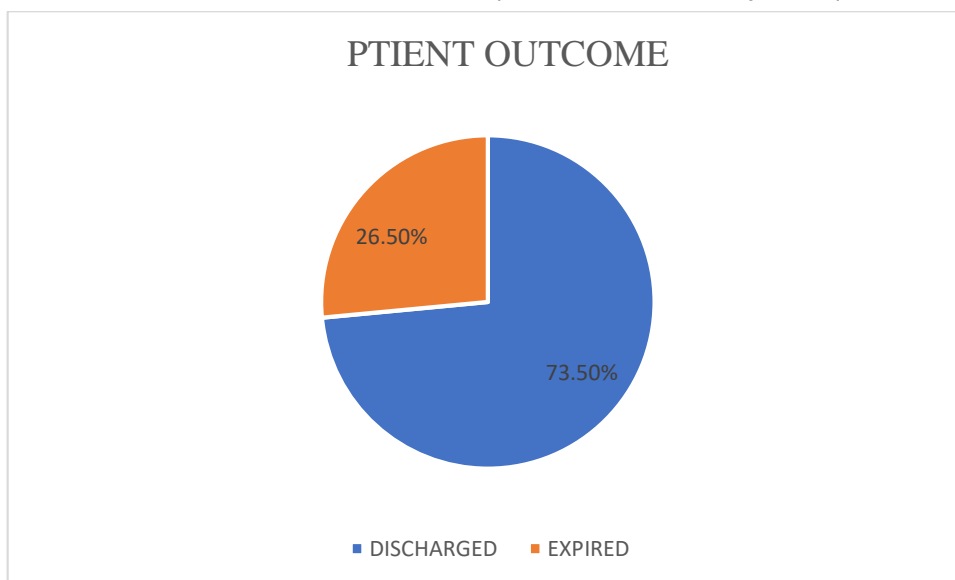


Figure 19: Distribution of sample according to Patient outcome

5. DISCUSSION

In this study, an attempt was made to assess the management of kidney disease associated with COVID-19 and assessment of age-wise & gender-wise distribution of patients. This study also evaluates the number of patients with GFR <15ml/min, Stages of CKD, frequency of dialysis, comparison of oxygen saturation levels with respiratory rate prediction in COVID-19 and Mortality rate in the study population of about 102 patients who have kidney disease and COVID-19 and who satisfied the inclusion and exclusion criteria for a period of 6 months in a tertiary care hospital, in Kannur.

Among 102 patients who were involved in this study, the total number of male patients was 68 (67%) and females were 34 (33.3%). Most of them belonged to the age category between 50-70 years (53.9%).

The major comorbidity seen in this study was Hypertension 73 (71.5%); a similar study was conducted by MahmutGok *et al.*^[12]

The majority of patients had fever 74 (72.5%), a similar study was conducted by Swarnim. *et al.*^[13]

COVID-19 is categorized into Category A, B & C. Most of the patients belong to Category C 50 (49%) which is the mild category of COVID-19, a similar study was conducted by Pranav Ramamurthy *et al.*^[14]

In a comparison of oxygen saturation levels with respiratory rate prediction in COVID-19 out of 102 population the mean oxygen saturation level was found to be 95% with a mean RR of 25.3 bpm, among them 57% suffered from dyspnea, a similar study was conducted by Trishala Menon *et al.*^[15]

The patients were categorized on the basis of CKD stage from 1-5 based on GFR rate, most of the patients admitted to the hospital belongs to stage 5, 70 (68.6%) patients; a similar study was conducted by Zheng Jiang, *et al.*^[16]

The frequency of dialysis and duration assessment shows most of the patients belong to the category of frequency of 3 times in a week 66 (64.7%) and 4-hour duration, a similar study was conducted by Lodge *et al.*^[17]

The glomerular filtration rate is categorized based on the CKD stages. Among 102 patients 72 (70.6%) falls belong to less than 15 ml/min; a similar study was conducted by Nikita Pawar *et al.*^[18]

On the management side major drug categories prescribed were Vitamin supplements, Antibiotics, Anticoagulants, Iron supplements, Corticosteroids, Erythropoiesis-stimulating agents, Diuretics, Inotropes, and Monoclonal antibodies were given. Among Vitamin supplements Vitamin B Complex with Vitamin B

(52.9%), Penicillin and beta-lactamase inhibitors Piperacillin and Tazobactam (33.33%) among antibiotics, Ritonavir (11.76%) among antivirals, Regular heparin (63.72%) among anticoagulants, Iron sucrose (38.23%) among Iron supplements, Methylprednisolone (54.9%) among Corticosteroids, Torsemide (40.19%) among diuretics, Erythropoietin (38.23%) among Erythropoiesis Stimulating Agents, Adrenaline (17.6%) among Inotropes, Casirivimab + Imdevimab (12.74%) among Monoclonal Antibody. Among the Supportive care, Oxygen support (61.76%) were given the most. The majority of patients required oxygen support; a similar study was conducted by Meredith McAdam *et al.*^[19] and Roberto Palumbo *et al.*^[20]

Out of the 102 admitted patients, (26.5%) of them were dead; a similar study was conducted by Ruyi Cai *et al.*^[21]

According to our study, the death rate among hospitalized patients was decreased by early disease detection, supportive care, initial therapy, and routine dialysis without skips.

Various drug types were administered to the COVID-19 participants having kidney disease in our study. It was discovered that vitamin supplements were most frequently administered to strengthen the immune system. Antiviral medications were used to treat COVID-19 viral infection, which causes sepsis, but they were not recommended among those with stage 4 and stage 5 kidney patients. Antibacterial medications were used to treat secondary bacterial infections that led to bacterial pneumonia brought on by COVID-19 viral infection, which was detected by elevated TLC, PCT, and CRP values. As evidenced by high CRP, PCT, and ESR values, Corticosteroids were administered to the body to decrease the overactive immunological response to the COVID-19 infection. Patients with COVID-19 and kidney illness had lower hemoglobin levels, therefore erythropoiesis-stimulating drugs were used to treat anemia. Anticoagulants were administered to the patients because they had elevated D dimer and platelet values, which led to the production of blood clots in the blood vessels of the kidneys, lungs, and other organs, resulting in a hypercoagulable state. Diuretics were used to treat pulmonary edema and maintain the fluid balance in kidney patients. Inotropes were administered for hypotensive shock, respiratory distress, and hypoxia. Because renal patient's immune systems are already compromised, monoclonal antibodies serve as a natural kind of defense against disease. Regular dialysis helped in preventing further worsening of kidney function.

6. CONCLUSION

Patients with kidney disease were more likely to contract COVID-19 infection due to exposure to dialysis units, altered immunity as a result of certain inflammation that weakened the body's immune response to infection, and loss of specific antibodies, which led to an increased hospitalization rate as well as a higher mortality rate among Kidney patients who had COVID-19. Therefore, they had to be treated because failing to do so would have compromised the patient's lives and caused a worsening of renal function.

Out of 102 population diagnosed with kidney disease with COVID-19, the majority of the patients were male, the study contains 67% of male patients. Disease conditions were commonly seen among the age group of 51-70 years. Major co-morbidities associated were hypertension. Patients suffered most commonly from fever. In our study, most of the Kidney patients had the mild category of COVID-19 which is Category C of COVID-19. We also did a study comparing oxygen saturation level with that of respiratory rate in patients with COVID 19 and mortality rate was found more among patients with decreased oxygen level and increased respiratory rate. Among the admitted patients, the majority of them belonged to Stage 5 of CKD. Stage determination of CKD was done on the basis of calculated GFR value. The majority of patients fall under the GFR category of less than 15 ml/min. As patients were suffering from kidney disease dialysis was done, most commonly with the frequency of 3 times a week with a duration of 4 hours.

Different categories of drugs like Vitamin supplements, Antibiotics, Antivirals, Corticosteroids, Erythropoiesis stimulating agents, Iron supplements, Anticoagulants, Diuretics, Inotropes, and Monoclonal antibodies were prescribed in our study, out of which Vitamin supplements were given the most among the 102 hospitalized patients.

Among Vitamin supplements Vitamin B Complex with Vitamin B 12, Penicillin and beta-lactamase inhibitors Piperacillin and Tazobactam among antibiotics, Ritonavir among antivirals, Regular heparin among anticoagulants, Iron sucrose among Iron supplements, Methylprednisolone among Corticosteroids, Torsemide among diuretics, Erythropoietin among Erythropoiesis Stimulating Agents, Adrenaline among Inotropes, Casirivimab + Imdevimab among Monoclonal Antibody were given.

Supportive care like Oxygen support, ICU, mechanical ventilation, and NIV was given. Most of the patients required oxygen support.

During hospitalization, 27 out of 102 patients were dead.

Since the cause and pathophysiology of COVID-19 were initially unclear, the healthcare system had to respond urgently to the disease's onset. In our study, all of the initial stages of therapy and supportive care were analyzed and found to lower patient death and hospitalization rates.

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