"SIGNIFICANCE OF NEUTROPHIL TO LYMPHOCYTE RATIO AND PLATELET TO LYMPHOCYTE RATIO FOR PREDICTING CLINICAL OUTCOME AND SEVERITY IN COVID-19 PATIENTS ADMITTED IN KLE'S DR. PRABHAKAR KORE HOSPITAL, BELGAVI, KARNATAKA"

BY

REG NO: BG0120011

Dissertation

Submitted to

KAHER, Belagavi, Karnataka,

In partial fulfilment of the requirements for the degree of

M.D.

In

GENERAL MEDICINE

DEPARTMENT OF GENERAL MEDICINE

JAWAHARLAL NEHRU MEDICAL COLLEGE,

KAHER, BELAGAVI – 590010

KARNATAKA.

JUNE/JULY 2023

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH, BELAGAVI, KARNATAKA.

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Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"SIGNIFICANCE OF NEUTROPHIL TO LYMPHOCYTE RATIO AND PLATELET TO LYMPHOCYTE RATION FOR PREDICTING CLINICAL OUTCOME AND SEVERITY IN COVID 19 PATIENTS ADMITTED IN DR PRABHAKAR KORE HOSPITAL",** is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

(Dr. Smita Sonoli)
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ABBREVIATIONS

ACE	ANGIOTENSIN CONVERTING ENZYME
ARDS	ACUTE RESPIRATORY DISTRESS SYNDROME
CBC	CELL BLOOD COUNT
CDC	CENTER FOR DISEASE CONTROL
CFR	CASE FATALITY RATE
CRP	C-REACTIVE PROTEIN
CT	COMPUTED TOMOGRAPHY
LDH	LACTATE DEHYDROGENASE
MERS	MIDDLE EAST RESPIRATORY SYNDROME
NLR	NEUTROPHIL LYMPHOCYTE RATIO
PLR	PLATELET LYMPHOCYTE RATIO
SARS	SEVERE ACUTE RESPIRATORY SYNDROME
WHO	WORLD HEALTH ORGANISATION

ABSTRACT

Background: Blood cell Interactions are essential in the pathophysiology of immune responses; inflammation and haemostasis. Study aimed to find the Significance of neutrophil to lymphocyte ratio and platelet to lymphocyte ratio for predicting clinical outcome and severity in COVID 19 patients admitted in Dr. Prabhakar Kore Hospital; KLE university belagavi"

Methodology: The present hospital based cross sectional study was conducted among the patients admitted and getting treated for COVID-19 infection aged more than 18yrs of age. Patients admitted at KLES Dr Prabhakar Kore hospital & MRC with Covid19 lab confirmed patients Consenting for the study were enrolled and Informed consent was taken. A detailed history was documented and clinical features assessed.15cc of venous blood was drawn and sent for basic laboratory tests complete blood counts including Neutrophil count; lymphocyte count platelets count, PT/INR renal function tests.

Result: In the present study, the mean age of patients was found to be 58.20±15.20yrs of age, majority were in age of 50-80yrs. There was male preponderance with 76.3% and female 23.70% with male to female ratio of 3.21:1. The majority of patients are slightly symptomatic to asymptomatic, with a mean age of 37.7 years, male (41.9 percent), and female (58.1 percent). There is higher mean of NLR and PLR among the patients included in the present study.

Conclusion: There is a significant higher NLR and PLR in predicting the outcome of the patients. The mean level of the NLR and PLR was higher among the patients with correlating to other markers. NLR and PLR are easily measurable, available, cost-

effective and reliable parameters which can be used in continuous monitoring which could help to predict the outcome in the treatment of COVID -19.

Keyword: COVID-19, Mortality, Neutrophil-lymphocyte, Platelet-lymphocyte, C-reactive protein.

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INTRODUCTION

Since December 2019, an unexplained pneumonia emerged in Wuhan China and soon spread globally, the etiology was thought to be a new virus and named as CORONA VIRUS disease or COVID-19 by WHO based on phylogeny, taxonomy and established problem, this virus was identified as severe acute respiratory syndrome virus by the corona virus study group. SARSCOV-2 is most probably originated from Bat and have the ability to spread from person to person causing the pneumonia and severe respiratory distress syndrome with a typical findings on imaging.

CORONA VIRUS has become a great cause of mortality and morbidity. Although majority of patients are mild, may deteriorate to ARDS , MODS also mortality. Thus, finding high risk factors for the progression of Corona virus disease is necessary to regress the progression of the disease.

Earlier studies have shown that patients in geriatric age group with comorbidities are most likely to progress and a distorted immune inflammatory response may be a major factor in the severity of the illness..[2] Studies have been done showing the change in CBC findings like neutrophilia, lymphopenia and thrombocytopenia in infected individuals of severe Covid-19 versus patients having mild infection.

Low lymphocyte percentage, low lymphocyte count, high neutrophil percentage, and high neutrophil count are signs of severe COVID-19 suggesting the viral load and immune state. A study done by Huang C et al. and Yang X stated in their articles that 85% of the critically ill patients of their study group with COVID-19

were found with lymphopenia Threfore, lymphopenia as an indicator of severe COVID-19 was confirmed.[3,4] So various studies have been Showing Neutrophil to lymphocyte ratio and Platelet to lymphocyte ratio higher in Patients with severity. Therefore; a study needs to be conducted to evaluate the clinical signs and symptoms and the Neutrophil to Lymphocyte ratio and Platelet to lymphocyte ratio and correlate the same with severity of Covid-19 infection.

Blood cell Interactions are essential in the pathophysiology of immune responses; inflammation and haemostasis. Studies suggested that Neutrophil to lymphocyte ratio and Platelet to lymphocyte ratio are inflammatory markers of immune mediated; metabolic; prothrombotic and neoplastic etiology. So we can analyse antibody easily available marker for prognostication of patient affected with COVID 19.

AIMS & OBJECTIVES

Aim

Significance of neutrophil to lymphocyte ratio and platelet to lymphocyte ratio for predicting clinical outcome and severity in COVID 19 patients admitted in Dr. Prabhakar Kore Hospital; KLE university belagavi"

Objective

Primary objective is to see the Neutrophil to lymphocyte ratio and Platelet to lymphocyte ratio of Covid-19 infected Patients.

Secondary objective is to correlate the Neutrophil to lymphocyte ratio; Platelet to lymphocyte ratio and the clinical severity of Disease.

REVIEW OF LITERATURE

Coronaviruses are emerged as an major health issue in both humans as well as animals.[5]Towards the end of 2019, a cluster of pneumonia patients in Wuhan, a city in China's Hubei province, were discovered to be the result of a newly discovered virus. It spread quickly, resulting in an epidemic in China and a significant rise in number of cases in other countries.[6] In February 2020, the World Health Organization declared COVID-19 as the coronavirus disease of 2019. The severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2) that causes COVID-19 was formerly known as 2019-nCoV. On March 11 of 2020, the WHO proclaimed COVID-19 to be a pandemic.[7]

Epidemiology

The first case of SARS CoV-2 infection was reported on December 31, 2019, in Wuhan, Hubei Province, China.

Subsequent to this, it rapidly progressed to various regions of Republic of China and globally , affecting almost 185 countries by April 2020, resulting in the present global pandemic. COVID-19 was labeled a Public Health Emergency of International Concern by the World Health Organization on 30 January 2020, and it was recognized as a pandemic on 11 March 2020.

The COVID 19 basic reproduction number (R0) is predicted in between 1.4 and 3.9, suggesting its extreme infective nature. In public gathering places without personal protective equipment, such as hospitals, cruise ships, and religious, political, academic, and business groups, the Reproduction rate is higher. Comparable to Covid

19 and MERS CoV, the incubation period is 5–6 days, and the serial interval is predicted to be 8 days. 8 At first, it was discovered that the CFR was between 0.9% and 3%, which was lower than the prior HCo vs SARS Covid 19 (6 percent to 17 percent) and MERS CoV (20 percent –40 percent). However, by May 24, 2020, the CFR has dramatically risen throughout a number of nations.

Unlike SARS CoV, a large proportion of covid 19 infected people are asymptomatic or pauci-symptomatic, allowing them to avoid identification and become potential carriers.[9] Its significant to note that not all close contacts contract the illness, which suggest that each person's genetic predisposition plays a part.[10,11] The virus normally enters humans through the upper aerodigestive tract. also, covid 19 was from found in patients excreta , indicating the possibility of fecal-oral transmission.[12,13]

Infection with Covid 19 in pregnancy increases the risk of transmission to the child. Mother to child transmission was unlikely, however, due to negative virus testing on swabs recovered from the six pregnant women from amniotic fluid, cord blood, neonate throat, and breast milk.[14] stretched distance aerosol transmission is hypothesized, which is dependent by the dynamics of the virus's flow from the diseased individual as well as the ventilation condition of the area.[15] Furthermore, mapping techniques like as cartograms can be used to depict the dissemination and expansion of SARS COV2.[16] Understanding the pathways of transmission of COVID 19 will allow for the use of appropriate containment measures.

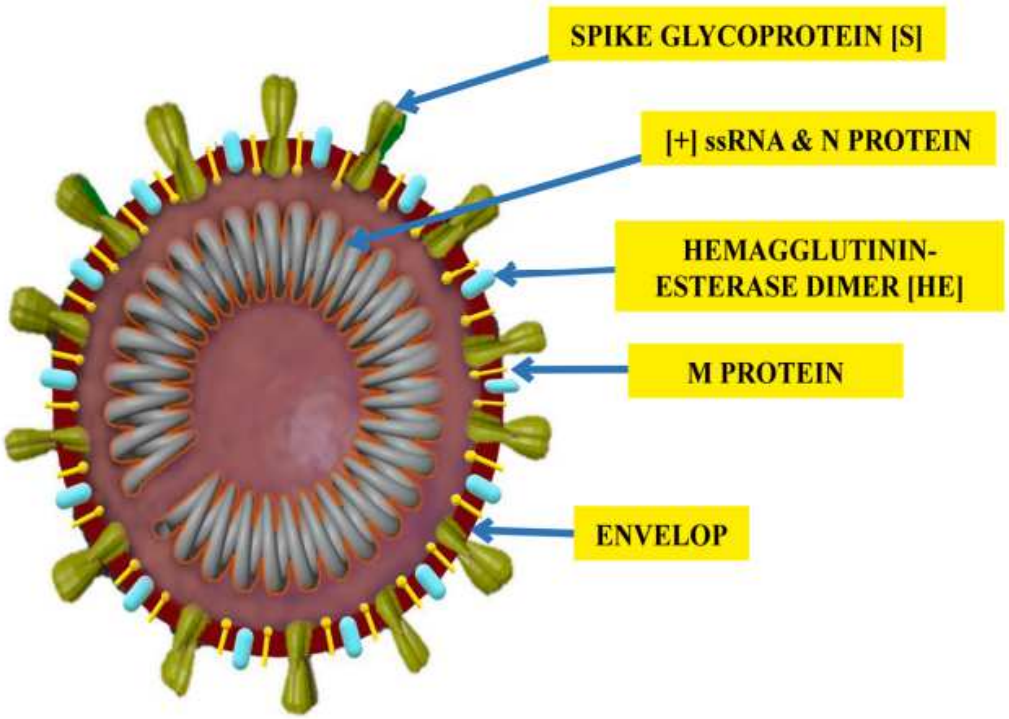

Figure 1: COVID-19 virus structure

Despite the fact that all age groups are at risk to COVID infection, the disease severity , death are lower in children.[17] Women are less typically impacted than males in adulthood due to higher plasma ACE2 levels.[18] The older population, in particular, with diseases like diabetes mellitus, systemic hypertension, CVA, and other pulmonary/cardiac/renal disease, is especially prone to critical infections due to insufficient immune response against infection and other issues .[19,20] A recent study found that, similar to SARS CoV, non-O blood groups, notably A group, was associated with higher infection and death rates due to a lack of protective antibodies. Numerous uncertainties remain in the COVID-19 epidemiology, particularly the virus-host interaction, including host vulnerability and epidemicity.[21,22]

The corona viruses (CoVs) can be divided into two categories: and (found in both mammals and humans); and (in avian species). Spike protein which is on its envelope, resemble a crown under an electron microscope, hence the name. Infections of the respiratory, gastrointestinal, hepatic, and central nervous systems in people and other mammals are brought on by them.

Thr estimations in general , imply that roughly 2% of the population is a carrier of CoVs, and they cause approximately around 5%–10% of acute respiratory tract infections. The hypothesis says that when these viruses transfer to humans from host via an intermediary amplifying host, they go through a speedy mutation and recombination, resulting in the emergence of covid viruses that are dangerous for humans . The majority of the time, CoVs affected are sometimes linked to various respiratory tract infections, yet they can sometimes be the only pathogen that infects children with common long-term illnesses.. As a result, CoVs have emerged as significant pathogens in rising respiratory illness outbreaks.

Pathogenesis

The highly glycosylated SARS CoV-2 S1 fraction with receptor binding domain (RBD), which binds to the angiotensin-converting enzyme 2 receptor (ACE-2 R) with 10–20 fold higher affinity than SARS CoV, is thought to infect human cells. The viruses SARS CoV and SARS CoV-2 are closely related. The primary source of ACE-2 R is type II rather than type I human alveolar epithelial cells. Endothelial cells, GIT epithelial layers, and cardiac myocytes all express the ACE-2 With SPRR insertion on the spike protein, transmembrane protease serine (TMPRSSs) expressed on host cells recognise and break the distinctive polybasic S1/S2 protease cleavage site, exposing the fusion protein (S2 part), allowing the viral and host cell membranes

to converge. It has been demonstrated that upper esophageal epithelium, absorptive enterocytes, and type 2 pneumocytes all considerably co-express TMPRSSs and ACE-2 R, suggesting that SARS CoV-2 can enter the host through these tissues in addition to alveolar epithelium.

Therefore, the tissues that could serve as viral targets should express both TMPRSSs and ACE-2 R. Viral RNA can internalise into the cytoplasm of the host cell thanks to this membrane fusion, where it is copied and translated to produce new viral proteins. The final phase before virions can infect other cells is viral assembly, which takes place right before virions are discharged from infected cells. During this stage, (N) proteins bind to RNA before being encased in an envelope and membrane protein. [8]

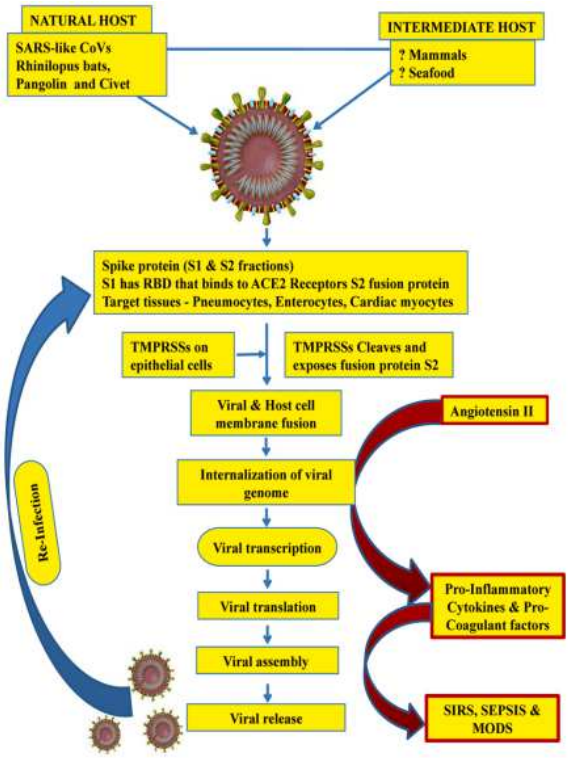

Figure 2: Pathogenesis of COVID-19 infection

Type II pneumocytes, which are in charge of tissue regeneration and surfactant production, are destroyed as a consequence of covid infection, increasing surface tension thereby causing dyspnea. Furthermore, the enhanced cytokine production and release (cytokine storm) by activated inflammatory cells brought on by angiotensin II buildup compromises the alveolar immunologic equilibrium mechanism in these damaged type II pneumocytes.[8]

Transmission

Observational studies of home transmission were conducted prior to the discovery of variants, and the SAR in paediatric contacts (upto 18 years) ranging from 4 to 57 %. [23–28] A meta-analysis of 87 home transmission studies with 1,249,163 household links from different c found regions of world found that the SAR was 18 percent in contacts who were under the age of 18 and 30% among contacts who were adults. More transmissible variations result in higher household transmission rates. Children under the age of 18 had a secondary attack rate of 72-75%, whereas adults suffered 90% of these attacks, according to a study of familial clusters carried out during the dominant circulation of the Alpha (B.1.1.7 lineage) variant..[29,30]

A case-control study found that SARS-CoV-2 infection in kids and teenagers was associated with contact with people infected with COVID-19 in social gatherings.[31]

There have also been stories of epidemics linked to health care, as well as instances where children or students may have contracted a disease from teachers or other school personnel. Regular use of preventative measures at school was connected

in a case-control study to SARS-CoV-2 infection, although regular attendance at school was not.[31]

Children with confirmed asymptomatic infection have been reported to transmit the virus to family members, despite the fact that nothing is known about transmission by truly asymptomatic children. 36 Additionally, there have been cases of familial clusters involving asymptomatic children as well as a possible channel of transmission from asymptomatic children to adults who are not family members. 36–39 such results indicate that asymptomatic children might contribute to transmission. 40,41. Asymptomatic transmission in adults is well known.

Clinical features

Although they occur at different frequencies in children and adults, COVID-19 symptoms are similar in both.COVID-19 affects children lesser compared to adults; however severe instances in children have been documented.

The spectrum of infection severity:

Mild disease (no or mild pneumonia) was reported in 81 percent.

Severe disease (eg, with dyspnea, hypoxia, or >50 percent lung involvement on imaging within 24 to 48 hours) was reported in 14 percent.

Critical disease (eg, with respiratory failure, shock, or multiorgan dysfunction) was reported in 5 percent.

The overall case fatality rate was 2.3 percent; no deaths were reported among noncritical cases.

Comparably, 2% of the 10.3lakh cases reported to (CDC) in the United States by the end of May 2020 were admitted to critical care unit , 5% of those instances resulted in death. Of those cases, 14% were hospitalised. Age, preexisting comorbidities, and immunisation history all affect the likelihood of developing a serious illness..[42]

Initial presentation:

The most typical reported symptoms with COVID-19 were headache, myalgias, and cough. Other characteristics include having diarrhoea, a sore throat, or abnormalities in taste or smell. The most frequent serious infection-related symptom is pneumonia, which is typically characterised by rise in temperature , coughing, shortness of breath , and bilateral infiltrates on chest imaging.

Symptoms that may be seen in patients with COVID-19[43]
Cough
Fever
Myalgias
Headache
Dyspnea (new or worsening over baseline)
Sore throat
Diarrhea
Nausea/vomiting
Anosmia or other smell abnormalities
Ageusia or other taste abnormalities
Rhinorrhea and/or nasal congestion
Chills/rigors
Fatigue
Confusion
Chest pain or pressure

Severe complications:

The complications described as

Respiratory failure

Cardiac and cardiovascular complications

Thromboembolic complications

Neurologic complications

Inflammatory complications

Secondary infections

Infection fatality rate

Among cases that have been recorded, the case fatality rate simply shows the mortality rate. There is a lot of heterogeneity by location and across risk groups, however some investigations of unvaccinated persons have estimated the infection fatality rate, or the predicted mortality rate among all individuals with illness, to be between 0.15 and 1 percent. This is due to the fact that many mild infections go untreated and many severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections are asymptomatic.[44]

A analysis of 27 studies from resource-rich locations found that infection mortality rates rose exponentially with age (0.002 percent at age 10, 0.01 percent at age 25, 0.4 percent at age 55, 1.4 percent at age 65, 4.6 percent at age 75, 15 percent at age 85, and >25 percent at age 90).

Through seroprevalence surveys or extensive tracing programmes, these research assessed the overall number of community infections up to September 2020.. These ageing issues changes appear to account for much of the documented geographic variance in infection fatality rates (i.e., areas with higher median population ages reported higher fatality rates).[45]

Comorbidities associated with risk factors for severe COVID-19[46,47]

Comorbidities that have been linked to severe COVID-19 in at least one meta-analysis or systematic review (starred conditions), in observational studies, or in case series, constitute established, plausible, and potential risk factors.

- Cancer
- Cerebrovascular accident
- Children with specific underlying illnesses
- Chronic kidney injury
- Long term pulmonary diseases (COPD, ILD, pulmonary thromboembolism, pulmonary artry hypertension, bronchopulmonary dysplasia, bronchiectasis, cystic fibrosis)
- Chronic liver disease (cirrhosis, NAFLD, ethanol use disorder, autoimmune hepatitis)
- Diabetes both, type 1 and type 2
- Down syndrome
- Cardiac manifestations (like heart failure,ischaemic heart disease, or cardiomyopathies)
- Human immunodeficiency virus
- Mental health disorders (mood disorders including depression, schizophrenia spectrum disorders)
- Degenerative CNS manifestations, including Alzheimers
- Obesity (BMI $\geq$30 kg/m^2) and overweight (BMI 25 to 29 kg/m^2)
- Recent/current pregnancy
- Smoking
- Sickle cell disease or thalassemia
- Solid organ or blood stem cell transplantation
- Substance abuse
- Tuberculosis
- Immunosuppressive medications

Possible risk factors but evidence is mixed (comorbidities have been associated with severe COVID-19 in at least 1 meta-analysis or systematic review, but other studies had reached different conclusions):

- Asthma
- Hypertension
- Other immune deficiencies

Danger signs for serious disease

- The majority of studies evaluating these tools are constrained by the bias risk and have not been sufficiently validated for clinical treatment. Several prediction tools have been proposed to identify patients who are more likely to have critical illness based on epidemiologic, clinical, and laboratory features.
- Advanced age
- Comorbidities
- Socioeconomic background and gender

Laboratory findings

The findings of laboratory are variable. In meta-analysis, the data of following laboratory abnormalities were noted down

- Elevated C-reactive protein: 54%
- Elevated serum ferritin: 47%
- Elevated lactate dehydrogenase: 37%
- Elevated D-dimers: 35%
- Elevated procalcitonin: 21%

- Elevated erythrocyte sedimentation rate: 19%
- Elevated laukocytes: 20%
- Lymohocytopenia: 19%
- Lymphocytosis: 8%
- Elevated serum aminotransferases: 30%
- Elevated creatine kinase myocardial bands: 25%

Table 1: Diagnostic tests for COVID 19

Test category	Primary clinical use	Specimen type	Performance characteristics	Comments
NAATs (including RT-PCR)	Diagnosis of current infection	Respiratory tract specimens*	▪ High analytic sensitivity and specificity in ideal settings. ▪ The kind and quality of the specimen, as well as the severity of the sickness at the time of testing, all affect clinical performance. ▪ Reported false-negative rate ranges from <5 to 40%, depending on the test used.¶	▪ Time to perform the test ranges from 15 minutes to 8 hours.Δ ▪ Turnaround time is influenced by the test used and laboratory workflow. ▪ Some assays allow home collection of specimens that are mailed in.
Serology (antibody detection)	Diagnosis of prior infection (or infection of at least 3 to 4 weeks' duration)	Blood	▪ Sensitivity and specificity are highly variable. ▪ IgG typically develops 14 days following the onset of symptoms, but detectable antibodies typically take several days to weeks to develop. ▪ There have been	▪ Time to perform the test ranges from 15 minutes to 2 hours. ▪ Turnaround time is influenced by the test used and laboratory

			reports of cross-reactivity with other coronaviruses. ▪ In environments with low seroprevalence, individual results should be interpreted cautiously because serologic tests with great specificity still have a low positive predictive value.	workflow. ▪ It remains uncertain whether a positive antibody test indicates immunity against future infection.
Antigen tests	Diagnosis of current infection	Nasopharyngeal or nasal swabs	▪ Antigen tests are generally less sensitive than nucleic acid tests. ▪ Within 5 to 7 days following the onset of symptoms, sick people have the highest levels of sensitivity.	▪ Time to perform the test is <1 hour.

Laboratories features associated with severe COVID-19 infection[19,20,48,49]

Abnormality	**Possible threshold**
Elevations in:	
▪ D-dimer	>1000 ng/mL
▪ CRP	>100 mg/L
▪ LDH	>245 units/L
▪ Troponin	>2× the upper limit of normal
▪ Ferritin	>500 mcg/L
▪ CPK	>2× the upper limit of normal
Decrease in:	
Absolute lymphocyte count	<800/microL (normal range for age ≥21 years: 1800 to 7700/microL)

Viral factors

Despite some studies finding no correlation between viral RNA levels and severity of disease, patients having critical illness have greater viral RNA levels in throat swabs as compared to patients having less severe illness. Blood coagulopathy, organ damage, and severe disease death have all been linked to viral RNA in the blood.[50–52]

Genetic factors

The potential link of host genetic variables with severe illness is also being investigated. The genome-wide association study connected the polymorphism in the ABO blood group gene to SARSCOV2 respiratory failure. A decreased risk of infection and serious disease has been associated with type O.[53,54]

Radiological findings

Chest Xray:

Chest Xray can be normal when a disease is just beginning. Retrospective analysis of 64 infected SARS COV2 individuals in Hong Kong revealed that 20% of them never had any abnormal chest radiographs throughout the duration of their illness. Consolidation and ground-glass opacities were frequently observed on abnormal radiographs for distributions in the bilateral, peripheral, and lower lung zones. The disease's lung involvement increased with time, reaching a peak in severity 10 to 12 days following the start of symptoms.

Chest CT

Even while CT Throrax is superior than a chest x-ray and chest CT also can be suggestive of infection, none can completely confirm or rule out the potential of infection.

Ground-glass opacities – 83%

Ground-glass opacifications(GGO) and mixed consolidation – 58 %

Pleural thickening – 52 %

Thickening of interlobular septum – 48 %

Air bronchograms sign – 46 %

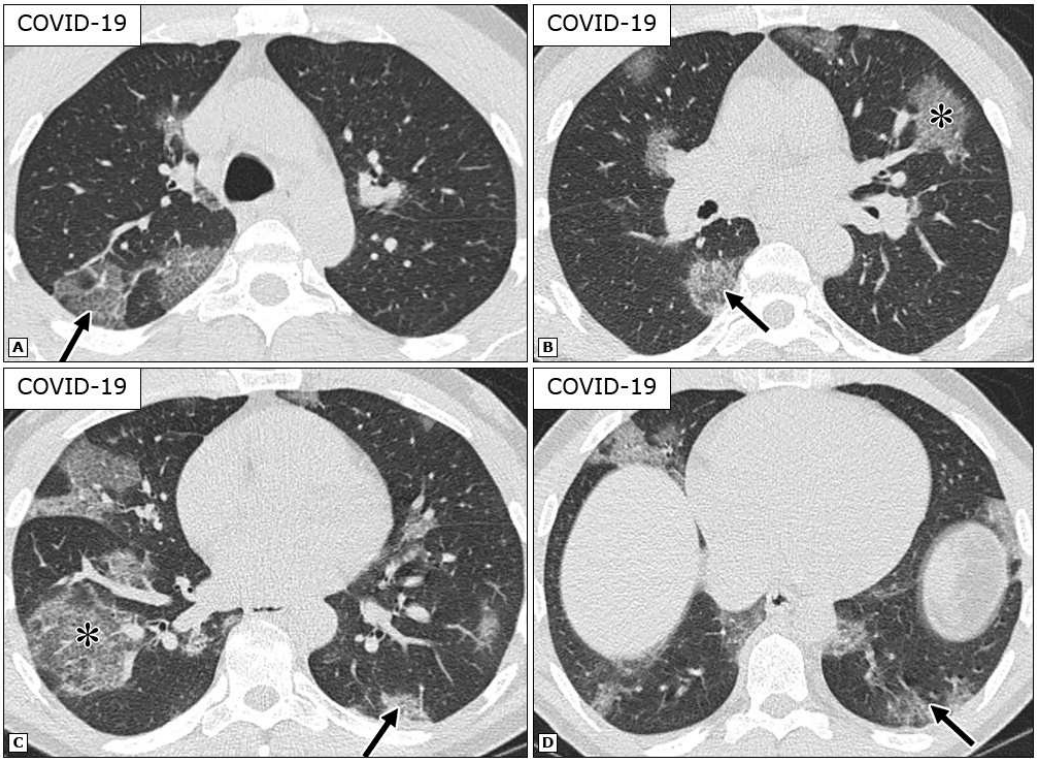

Figure 3: Chest CT findings related to COVID-19[56]

Figure 3 showing: For COVID-19, typical CT imaging characteristics. The lungs of a 52-year-old man with a positive RT-PCR are obvious in unenhanced thin-section axial images (A to D) as having bilateral, multifocal rounded (asterisks) and

peripheral GGO with superimposed interlobular septal thickening and discernible intralobular lines ("crazy-paving"). Most professional organisations including the US Centers for Disease Control and Prevention do not currently advise routine CT screening for the diagnosis or exclusion of COVID-19.[56]

Other less common abnormalities included bronchiectasis, pleural effusion, pericardial effusion, lymphadenopathy, and a crazy paving pattern .

COVID-19 chest CT abnormalities frequently involve the lower lobes, are bilateral, and have a peripheral distribution.

Lung Sonography:

One method for assessing lung involvement in individuals with probable COVID-19 is lung sonography. In addition to discrete, multifocal, or confluent B lines visible under the pleura, patchy, and nodular consolidations, also air bronchogram signals inside the consolidations, patients with COVID-19 exhibit pleural line thickening, discontinuing, and disruption.57,58 [188-190].Despite the fact that ultrasound seems to be somewhat sensitive for diagnosing COVID-19, other investigations have found that it is not very specific.

Role of inflammatory markers like NLR and PLR in COVID-19

Neutrophil Lymphocyte ratio (NLR)

In normal circumstances, the human blood contains 4000-11000 WBCs per microlitre. The most numerous are these granulocytes. Granulocytes have horseshoe-shaped nuclei that become multilobed as they age. The majority of them have neutrophilic granules.

Biologically active chemicals that contribute to inflammatory responses are found in the cytoplasmic granules of neutrophils. The typical half-life of a neutrophil in the blood is 6 hours. They roll along the endothelium surface after being drawn there by selectins. Selectins can be bound to neutrophil adhesion molecules from the integrin family. They enter the capillary walls by a process called diapedesis. The GI tract absorbs a large portion of those that bypass the circulatory system and eliminates them from the body.

Numerous proteases, as well as enzymes like NADPH oxidase, catalase, and myeloperoxidases, are present in neutrophilic granules. The "Respiratory burst," a rapid rise in oxygen consumption and metabolism in neutrophils associated with NADPH oxidase, results in a significant release of free O-radicals. The enzyme myeloperoxidase catalyses the transformation of cyanides and halides into acid forms. These acids themselves act as strong oxidants.

Neutrophil granules contain two metalloproteinases, an elastase, myeloperoxidase, and NADPH oxidase. Total body neutrophils come in two different varieties: circulation pool (CGP) and marginating granulocyte pool (MGP). The cells of these two pools are of identical size and are always in an equilibrium state. MGP, which indicates neutrophils involved in adhesion and rolling along endothelial cells in postcapillary venules, is not present in blood collected after venepuncture. As a result, the neutrophil content contains almost half of the vascular compartment's neutrophils.

Lymphocytes are movable, non-phagocytic cells. Numerous lymphocyte subpopulations communicate with one other and with monocyte macrophage system cells. Both humoral and cell-mediated immunity are supported by them. Proliferating lymphocytes have higher concentrations of the n-terminal deoxyribonucleic acid

transferase enzyme. It is absent from mature lymphocytes but is present in thymocytes and immature lymphoid cells in bone marrow. T-lymphocytes contain large amounts of adenosine de aminase, which is required for immunological action.

Inflammation

A natural defence against the invasion of microorganisms and poisons is inflammation. Vascular and cellular responses are the two basic parts of the inflammatory response. Both reactions are mediated by chemical elements taken from plasma proteins or cells created as a result of an inflammatory response.

A protracted period of active inflammation, tissue deterioration, and repair define chronic inflammation. Endogenous hazardous plasma lipid components can increase the chronic inflammatory processes of atherosclerosis and vascular disease, which affect the arterial wall.

Chronic inflammation morphological features

- Tissue destruction
- Mononuclear cell infiltration
- Healing by connective tissue replacement
- Fibrosis
- Vascular endothelial growth factors and other angiogenic factors

NLR in subclinical inflammation

A high neutrophil lymphocyte ratio is a sign of latent inflammation in various vascular disease conditions. Even though it may also be influenced by systemic infections, atherosclerosis, hypertension, chronic renal illness, and diabetes, NLR refers to the systemic inflammatory response brought on by chronic disease.

Mechanism

The onset of inflammation is signaled by endothelial dysfunction caused by the cellular response of blood components. Endothelial dysfunction impairs nitric oxide and prostacylin production. This depletes the vascular endothelium's anti-atherogenic, antithrombotic, and vasodilator properties.

In the control population, the normal d-NLR is <2.0.

To evaluate the PLR connection as a significant prognostic factor among patients with Coronavirus illness, Qu R et al. (2020) conducted a study. Patients with platelet peaks during therapy experienced lengthier hospital stays on average than those without platelet peaks (P.05). Patients who experienced platelet peaks during therapy on average were older than patients who did not (P.05). Patients whose platelets dramatically increased with therapy stayed in the hospital longer on average. Furthermore, the average number of hospital days was longer in individuals who had higher PLR during therapy. The volume of platelets and their dynamic changes throughout treatment may be able to predict the severity and prognosis of the disease, according to a single-center case series of 30 hospitalised patients with confirmed COVID-19 at Huizhou Municipal Central Hospital. The cytokine storm may be responsible for the patient with noticeably increased platelets and a longer than usual

hospital stay. A potential measure for the monitoring of COVID-19 patients may be the PLR of patients, which represents the intensity of the cytokine storm.[2]

RDW, NLR, PLR, and CRP were evaluated as biomarkers in laboratory-confirmed COVID-19 patients in the study by Seyit M et al. (2020), which also looked at the best diagnostic biomarkers and cutoff values. In people with positive Sars CoV-2 PCR results, CRP (p = 0.0001), LDH (p = 0.038), PLR (p = 0.0001), and NLR (p = 0.001) levels remained significantly higher. In contrast, Sars CoV-2 negative individuals had significantly higher eosinophil (p = 0.0001), lymphocyte (p = 0.0001), and platelet counts (p = 0.0001). The results showed that COVID-19 positive patients had significantly higher levels of CRP, LDH, PLR, and NLR, while COVID-19 negative patients had significantly higher levels of eosinophils, lymphocytes, and platelets.[60]

In study by Zhu C et al., (2020) to assess the predictive value of NLR and PLR in COVID-19 patients. The conclusion that results from merely adding NLR/PLR to a linear model may be biassed because there should be a nonlinear relationship between these parameters and outcomes. For instance, using information from the MIMIC database, we hypothesised that NLR/PLR and death in critically ill patients with lung infection would be unadjustedly linked (Fig. 1).The non-linear correlation somewhat supports our theory even if the cohort is different from the one in the current study. If so, as both high and low NLR/PLR were associated with greater mortality, NLR/predictive PLR's power in AUC can be jeopardised.[61]

In study by Jimeno S et al., (2020) to assess the prognostic implications of NLR in COVID-19 patients. In study 45 (12.1 percent) of the patients had severe acute respiratory failure that need breathing assistance47 (12.6%) of the patients

passed away. Older patients (P = 0.002), those with considerably higher NLR upon admission (P = 0.001), higher rises in Peak NLR (P = 0.001), and patients with a faster rate of NLR growth (P = 0.003) were the patients who had worse outcomes in comparison to those who received follow-up therapy. Age, cardiovascular disease, C-reactive protein at admission, and Peak NLR were all found to be substantially linked with death by multivariable logistic regression. NLR is an easy-to-measure, generally accessible, affordable, and reliable parameter whose ongoing monitoring could help in the identification and management of COVID-19.[62]

In a study published in 2020 by Tiwari et al., the authors assessed the changes in NLR, PLR, and haematological markers of COVID-19 patients' clinical outcomes in India. Patients have a mean age of 37.7 years, are mostly slightly symptomatic to asymptomatic (41.9 percent), and are male (58.1 percent). The NLR and PLR at baseline between male and female patients do not differ statistically significantly, according to the 95 percent confidence range. A statistically significant rise in lab values is seen during follow-up visits. Most of the patients are female, younger, and present with modest clinical symptoms. Patients in paediatrics only have mild symptoms. The initial CBC values reveal mild lymphopenia, eosinopenia, neutrophilia, and thrombocytopenia. There was an increase in CBC values and NLR in the subsequent cases.Anemia was not detected in either the baseline or follow-up CBCs. A single PLR does not indicate disease progression. [1]

In a study published in 2020 by Huang S et al., the importance of NLR and PLR for predicting clinical outcomes in COVID were evaluated. Males make up a greater percentage of the population in severe instances than in less severe ones. There is a significant age difference between the two groups (p=0.022). More

comorbidities, like hypertension, diabetes mellitus, chronic obstructive pulmonary disease (copd), and fatty liver, were present in severe patients than in non-severe patients. There was a substantial difference between NLR and PLR (p 0.001).Diabetes, fatty liver, coronary heart disease, and NLR were all substantially related with severe COVID-19 patients. NLRs were 1.729 times greater in the severe group of patients compared to the non-severe group. NLR is a distinct risk factor for patients with critical COVID-19. PLR and NLR significantly differed between people with critical and mild problems, indicating that evaluating PLR and NLR may be useful for identifying COVID-19 patients who are at high risk.[64]

In study by Chan et al., (2020) to assess the use of NLR and PLR in COVID-19. A total of 20 trials with a total of 3,508 patients were included in the analysis. Nineteen studies revealed NLR values, while five studies reported PLR values comparing COVID-19 individuals with severe and non-severe disease. Patients with severe disease had higher levels of NLR (SMD: 2.80, 95 percent CI: 2.12 - 3.48, P<0.001) and PLR (SMD: 1.82, 95 percent CI: 1.03 - 2.61, P<0.001) than those with non-severe disease. In COVID-19, NLR and PLR can be employed as independent prognostic indicators of disease severity. [65]

In a study by Ozsari S et al., (2021), the NLR, PLR, and mean platelet volume with PCR test were evaluated and contrasted in covid patients. The polymerase chain reaction levels and neutrophil lymphocyte ratio in group C were statistically higher than those in group B (p0.001 in both cases). There was no statistically significant difference in the mean platelet volume between the groups (p>0.005 for all). Neutrophil lymphocyte ratio and C-reactive protein had a significant positive correlation (r=0.421, p0.001).

The PCR and CRP had a favourable correlation (r=0.243, p=0.001) as well. The thorax tomography result can be seen before the polymerase chain reaction test. The polymerase chain reaction test's sensitivity varies based on the tester, the test's execution, and the test's overall quality. As a result, patients with negative polymerase chain reaction results and thorax tomography findings should have their neutrophil lymphocyte ratio and platelet lymphocyte ratio levels checked, and they should be monitored if a COVID-19 diagnosis is suspected.[66]

In study by Man MA et al., (2021) to assess the NLR, PLR and Eosinophils correlation with high resolution CT severity score among the COVID-19 patients. 139 patients with verified corona virus disease and 149 age-matched controls underwent blood testing, and COVID-19 patients underwent HRCT thorax scans. Both the severity of a positive chest CT scan and NLR and PLR have been connected. Both the severity of a positive chest CT scan and NLR and PLR have been connected. When the NLR value is larger than 5.04, the chance of substantial CT alterations is only 50%, however when the NLR value is less than 5.04, the CT score is less than 3 with a 94% likelihood. Chest CT severity of 2 is correlated with an eosinophil value of 0.35 percent (Se = 0.88, Sp = 0.43, AUC = 0.661, 95 percent CI (0.544; 0.779), p = 0.021). NLR and PLR scores were considerably higher in COVID-19 patients. NLR = 2.90 and PLR = 186 in the study had strong specificity (0.89, p = 0.001 and 0.92, p0.001, respectively). A thorax CT should be ordered if the NLR and PLR levels are higher since it may reveal important lesions that could affect the patient's future care.

MATERIAL & METHOD

Source of data: Patients admitted in KLE's Dr. Prabhakar Kore Hospital and MRC, Belagavi fulfilling inclusion criteria.

Study design: A one year hospital based cross sectional study

Sample size formula:-

The prevalence rate-based formula for the minimal sample size is

$$n = \frac{Z\alpha^2 p\,(1-p)}{d2}$$

where P is the prevalence percentage and d is the likelihood of the prevalence difference in percentage.

Z and significance level are related. Z = 1.96 at the 5% level of significance.

With P = 34% and d = 25% of P = 8.50%, the sample size is 119.

Inclusion criteria:

- Lab confirmed covid19 Patients admitted in
- KLE Dr Prabhakar Kore Hospital
- AGE >18 YEARS

Exclusion CRITERIA:

- Age<18 years
- Tuberculosis
- Neoplasms

METHODOLOGY

Patients admitted at KLES Dr Prabhakar Kore hospital & MRC with Covid19 lab confirmed patients Consenting for the study were enrolled and Informed consent was taken. A detailed history was documented and clinical features assessed.15cc of venous blood was drawn and sent for basic laboratory tests complete blood counts including Neutrophil count; lymphocyte count platelets count, PT/INR renal function tests. Based on the clinical picture and test results patients were divided into severe cases and mild cases.

There is a link between severe cases and the neutrophil to lymphocyte and platelet to lymphocyte ratios.

STATISTICAL ANALYSIS

Since the study is of observational study the plan of analysis was followed. For the continuous quantitative variables mean and standard deviation was calculated. For The purpose of comparison. The continuous variables were compared using Student's unpaired t- test. The pre and post treatment measures were compared using student's paired t test Discrete variables were represented by median. The categorical data were expressed in terms of rates, ratios and percentages. The association between the outcome, clinical and Demographic characteristics were tested using Chi-square test, test of proportion or Fisher's exact test. For discrete variables nonparametric tests was used. For all the tests the value of p less than 5% (0.05) was considered significant and all the data was analysed using SPSS v21 operating on windows 10.

RESULTS

In the present study, the mean age of patients was found to be 58.20±15.20yrs of age, majority were in age of 50-80yrs. There was male preponderance with 76.3% and female 23.70% with male to female ratio of 3.21:1. The majority of patients are slightly symptomatic to asymptomatic, with a mean age of 37.7 years, male (41.9 percent), and female (58.1 percent).

Table 1: Agewise distribution of patients

AGE	NUMBER	%
20 - 29	4	2.96
30 - 39	13	9.63
40 - 49	21	15.56
50 - 59	33	24.44
60 -69	32	23.70
70-79	21	15.56
≥ 80	11	8.15
TOTAL	135	100.00

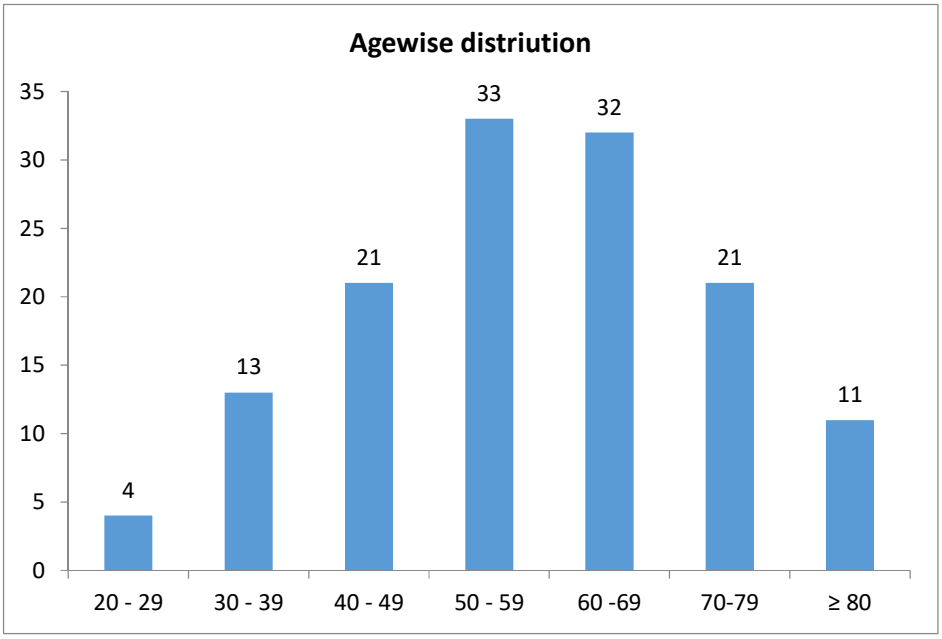

Figure 1: Agewise distribution of patients

Table 2: Mean age of participants

	MEAN	S.D.	MIN	MAX
AGE	58.20	15.20	24	102

Table 3: Showing the distribution of patients gender in the study

GENDER	NUMBER	%
Female	32	23.70
Male	103	76.30
TOTAL	135	100.00

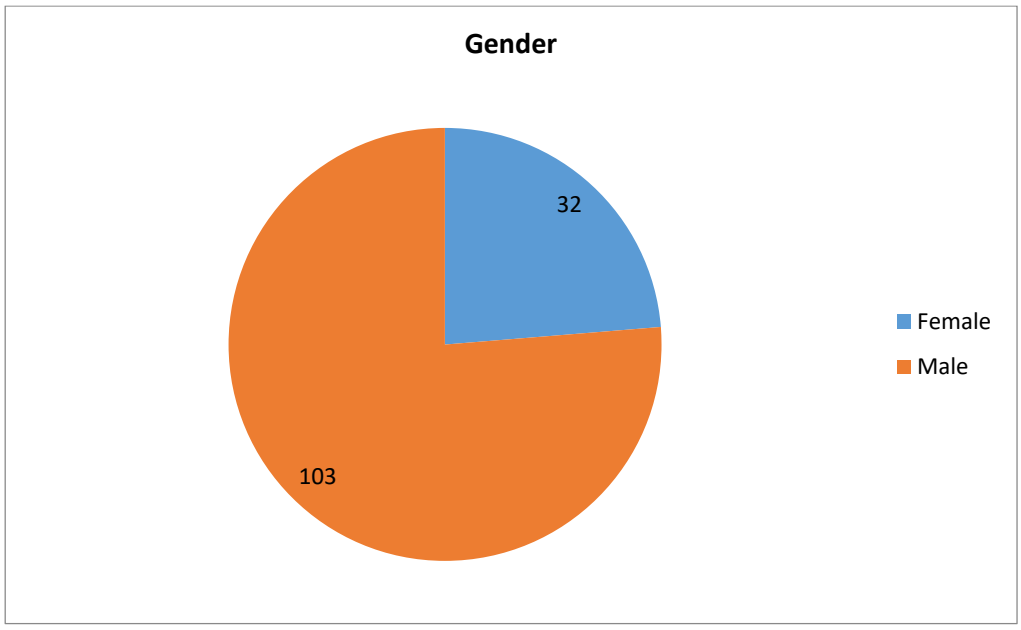

Figure 2: Showing the distribution of patients gender in the study

Table 4: Showing the symptoms of patients at presentation

SYMPTOMS	NUMBER	%
Cough	88	65.2
Fever	79	58.5
Breathlessness	107	79.2
Myalgias	17	13.3
Loss of smell	1	0.7
Loss of taste	1	0.7
Nil	3	2.1

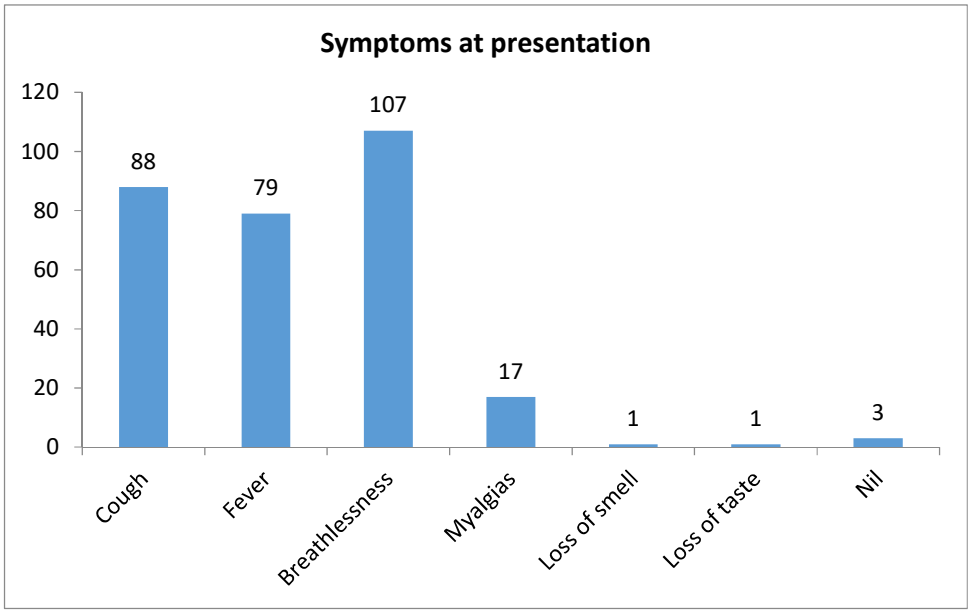

Figure 3: Showing the symptoms of patients at presentation

Table 5: Showing the other symptoms of the patients at presentation

OTHER SYMPTOMS	NUMBER	%
Altered Sensation	1	0.74
Abdomen Pain	1	0.74
Chest Pain	1	0.74
Chest Pain	1	0.74
Drowsiness, Vomiting	2	1.88
Facial Swelling	1	0.74
Headache	3	2.2
Hemoptysis	1	0.74
Loss Of Appetite	1	0.74
Restlessness	1	0.74
Right Eye Swelling X 5 Days	1	0.74
Nil	121	89.63
TOTAL	135	100.00

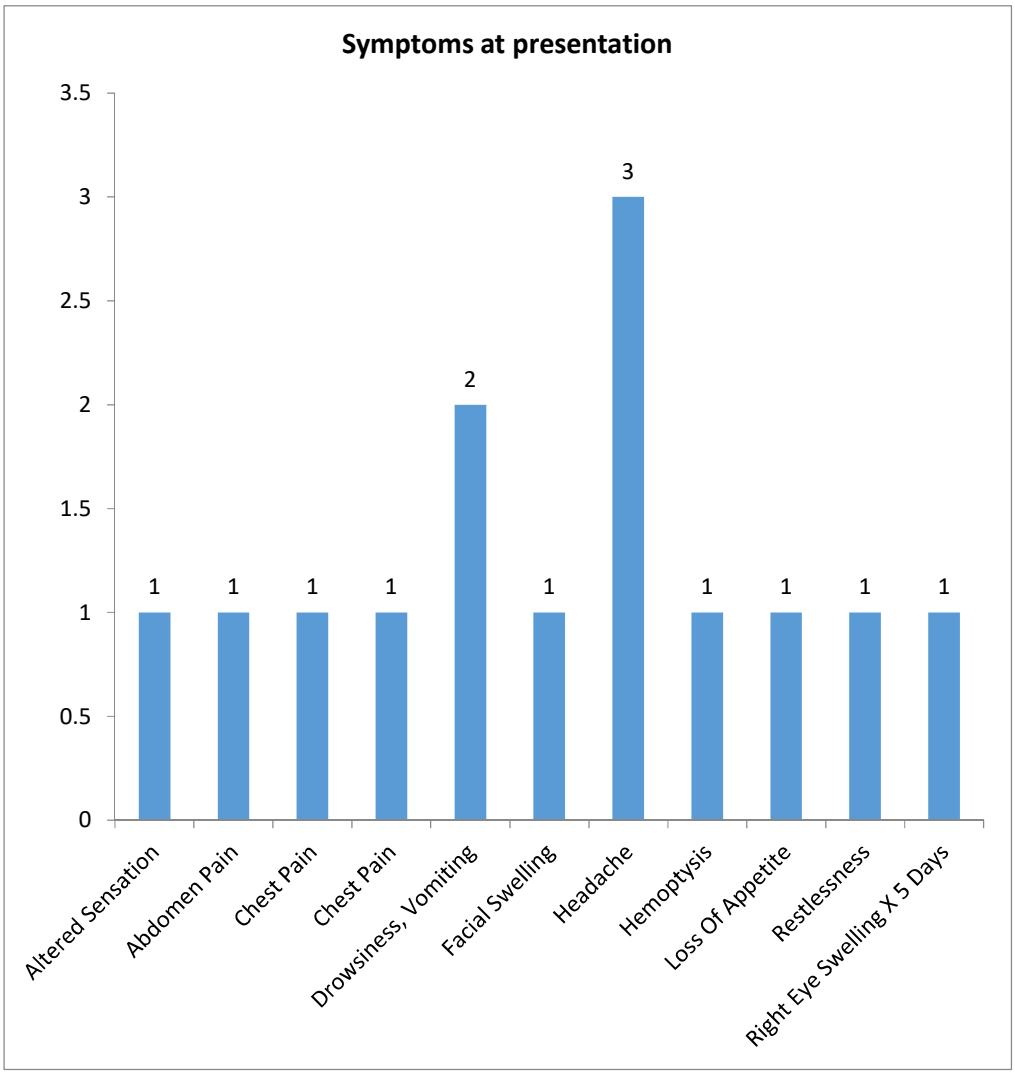

Figure 4: Showing the other symptoms of the patients at presentation

Table 6: Showing the time to hospital from symptoms onset

Time To Hospital From Symptom Onset (DAYS)	NUMBER	%
≤ 2	25	18.52
3 - 4	26	19.26
5 - 6	27	20.00
7 - 8	18	13.33
≥ 8	9	6.67
NOT RECORDED	30	22.22
TOTAL	135	100.00

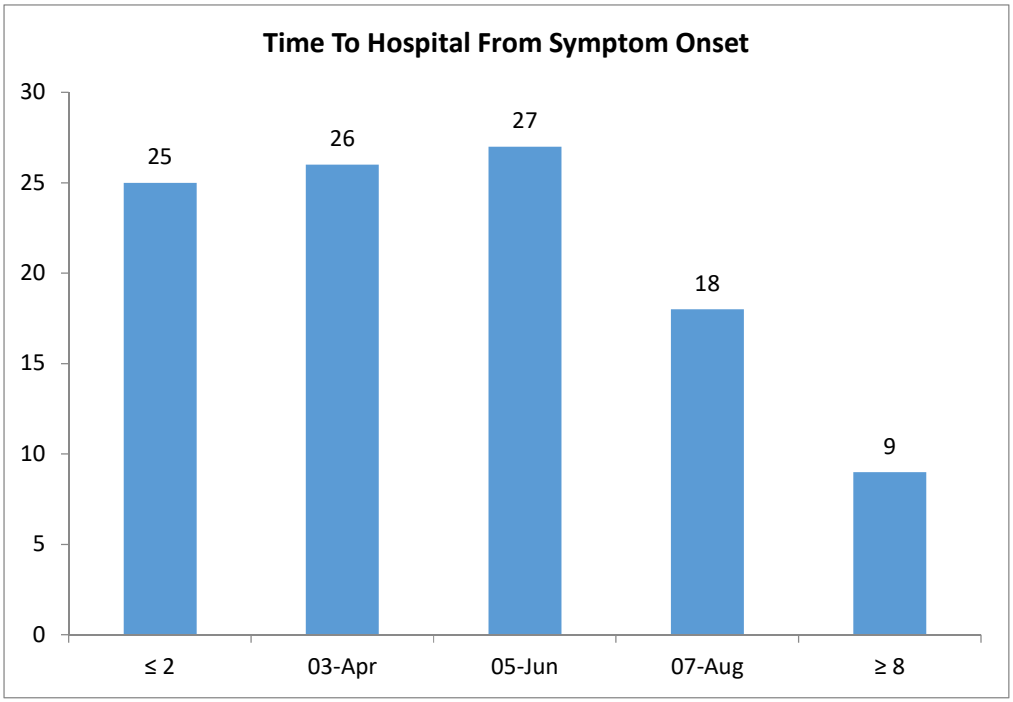

Figure 5: Showing the time to hospital from symptoms onset

Table 7: Showing the distribution of admission respiratory rate

Admission Respiratory rate (RR/min)	NUMBER	%
15- 19	1	0.74
20 - 24	24	17.78
25 - 29	14	10.37
30 - 34	26	19.26
≥ 35	5	3.70
NOT RECORDED	65	48.15
TOTAL	135	100.00

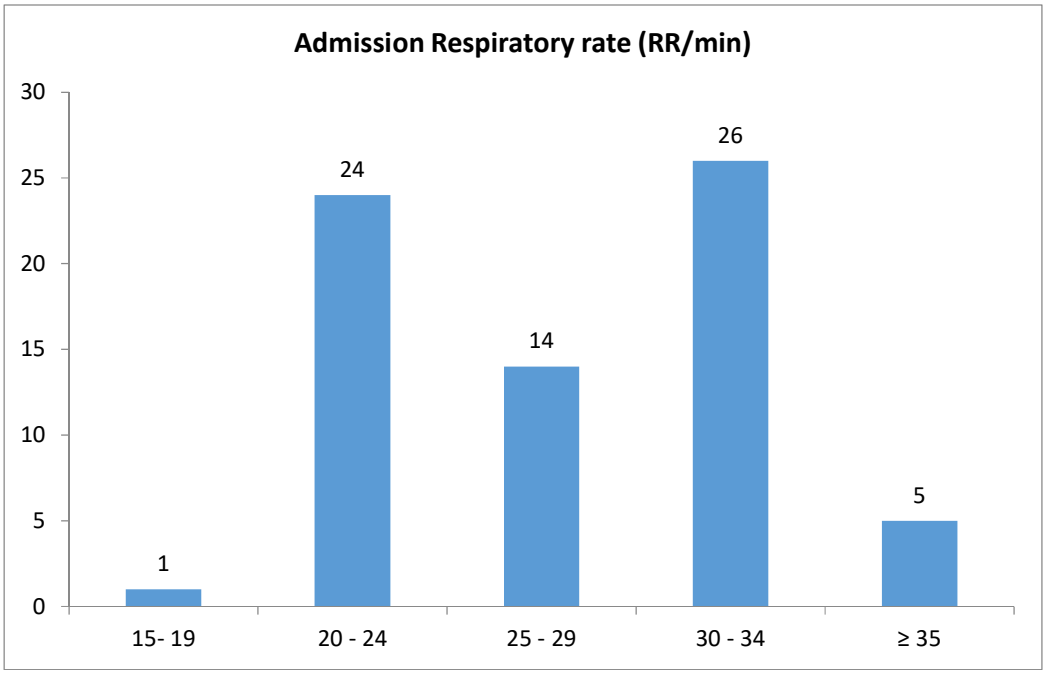

Figure 6: Showing the distribution of admission respiratory rate

Table 8: Showing the distribution of SpO2 at admission

ADMISSION SPO2	NUMBER	%
< 40	3	2.22
40 - 49	4	2.96
50 - 59	6	4.44
60 - 69	7	5.19
70 - 79	9	6.67
80 - 89	39	28.89
90 - 99	51	37.78
100	8	5.93
NOT RECORDED	8	5.93
TOTAL	135	100.00

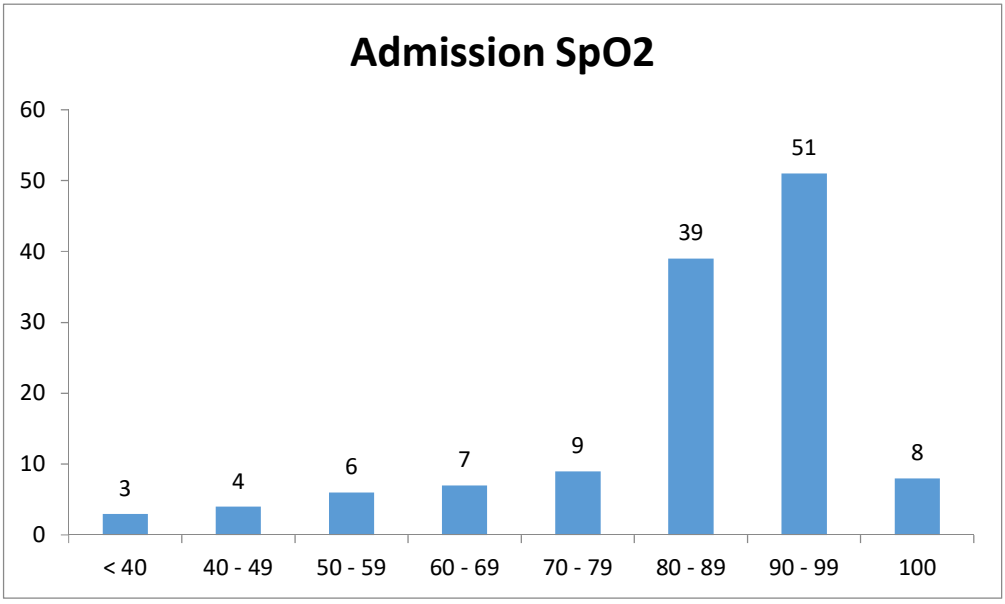

Figure 7: Showing the distribution of SpO2 at admission

Table 9: Showing the mean level of SpO2 at admission

	MEAN	S.D.	MIN	MAX
ADMISSION SPO2	83.48	16.08	27	100

Table 10: Showing the oxygen modality at admission

ADMISSION O2 MODALITY	NUMBER	%
CPAP	5	3.70
HFNC	2	1.48
HFO	5	3.70
MASK O2	17	12.59
NIV	6	4.44
NRBM	9	6.67
O2 SUPPORT	2	1.48
RA	41	30.37
RBM	21	15.56
VENTILATOR	3	2.1
NOT RECORDED	24	17.78
TOTAL	135	100.00

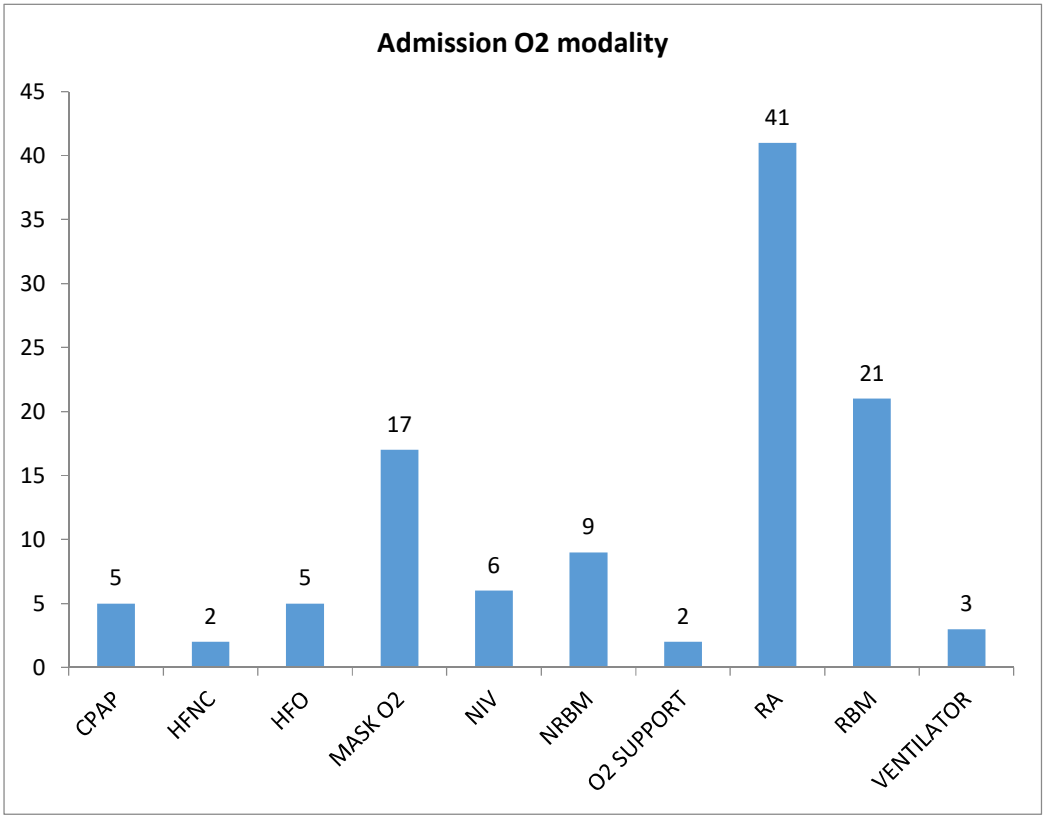

Figure 8: Showing the oxygen modality at admission

Table 11: Showing the mean level of oxygen used at treatment

	MEAN	S.D.	MIN	MAX
Mean Oxygen	14.97	10.66	1.5	60

Table 12: Showing the various comorbidities among the study patients

Co-Morbidities	NUMBER	%
Diabetes mellitus	59	
Hypertension	56	
Chronic kidney disease	9	
Ischemic heart disease	5	
Thyroid disorder	3	
Asthma	2	

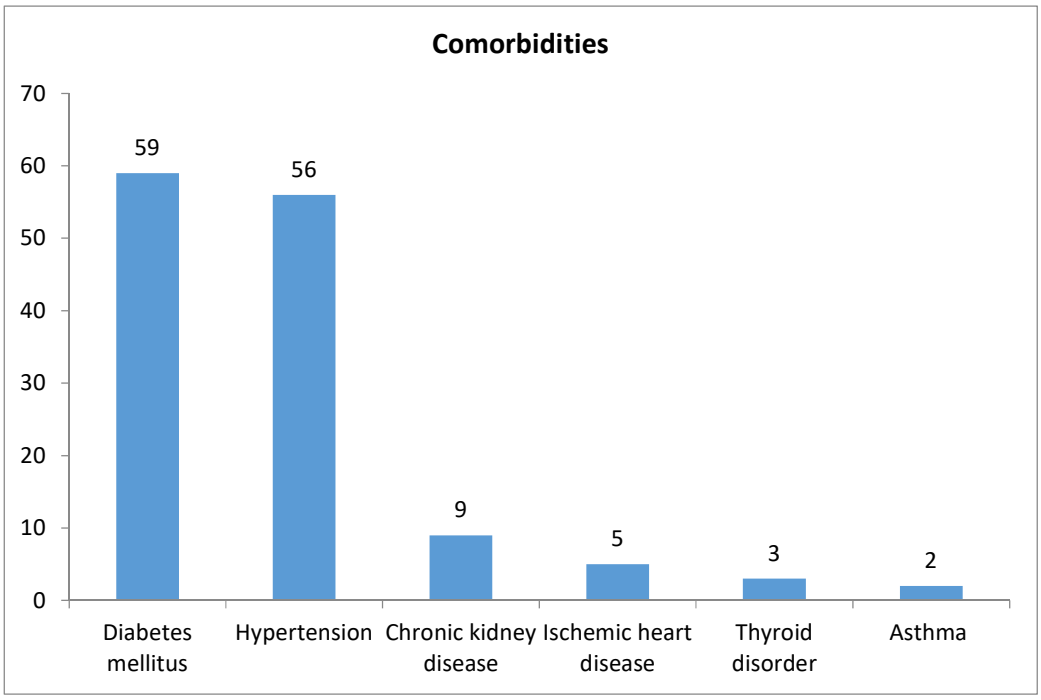

Figure 9: Showing the various comorbidities among the study patients

Table 13: Showing the distribution of duration of hospital stay among the study participants

Duration of hospital stay (DAYS)	NUMBER	%
0	4	2.96
1	13	9.63
2	20	14.81
3	6	4.44
4	17	12.59
5	11	8.15
6	7	5.19
7	10	7.41
8	10	7.41
9	8	5.93
10	7	5.19
≥ 11	19	14.07
NR	3	2.22
TOTAL	135	100.00

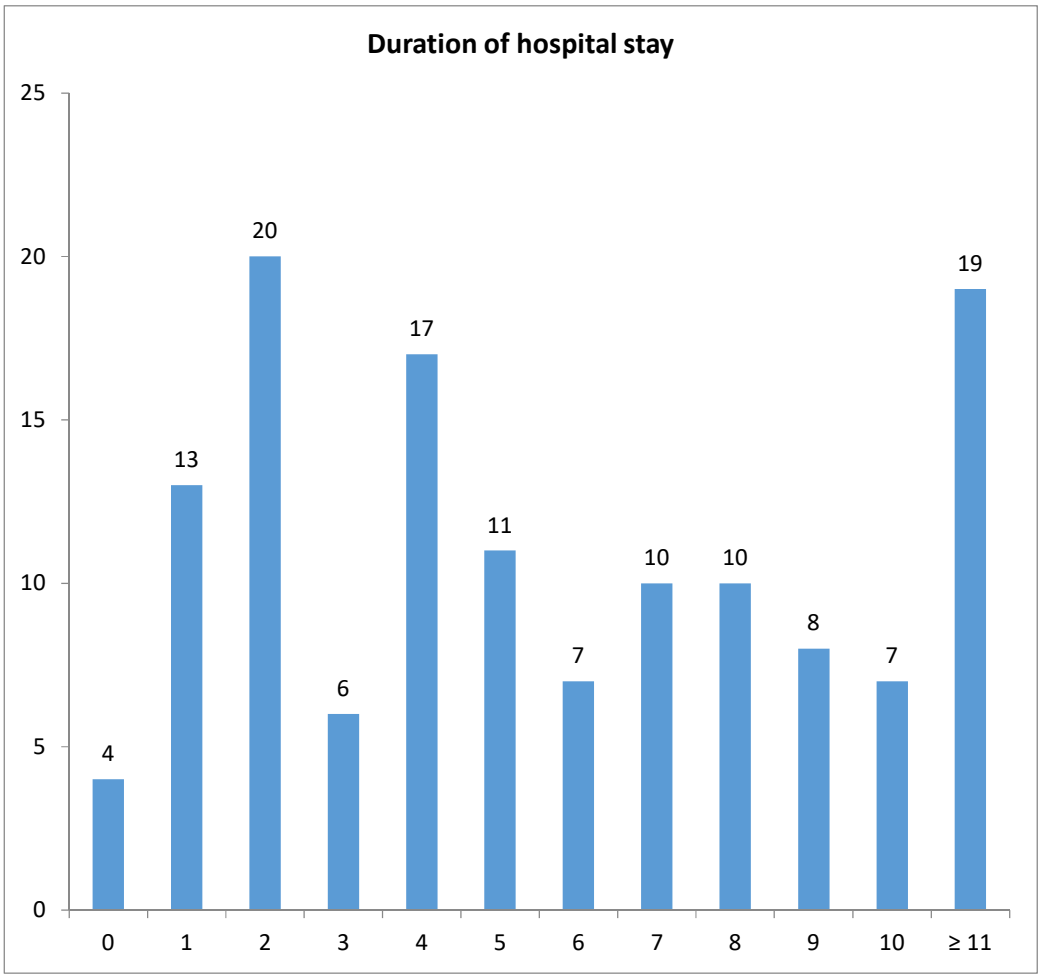

Figure 10: Showing the distribution of duration of hospital stay among the study participants

Table 14: Showing the mean level of duration of hospital stay, and other blood parameters

	MEAN	S.D.	MIN	MAX
Duration of hospital stay	6.62	6.52	0	42
Creatinine	1.93	3.01	0.41	21.74
Bilirubin	0.63	0.51	0.14	3.32
SGOT 1	57.35	40.80	6.1	273
SGPT 1	65.45	161.75	10	1265
SPO2 1	76.66	31.16	0.5	100

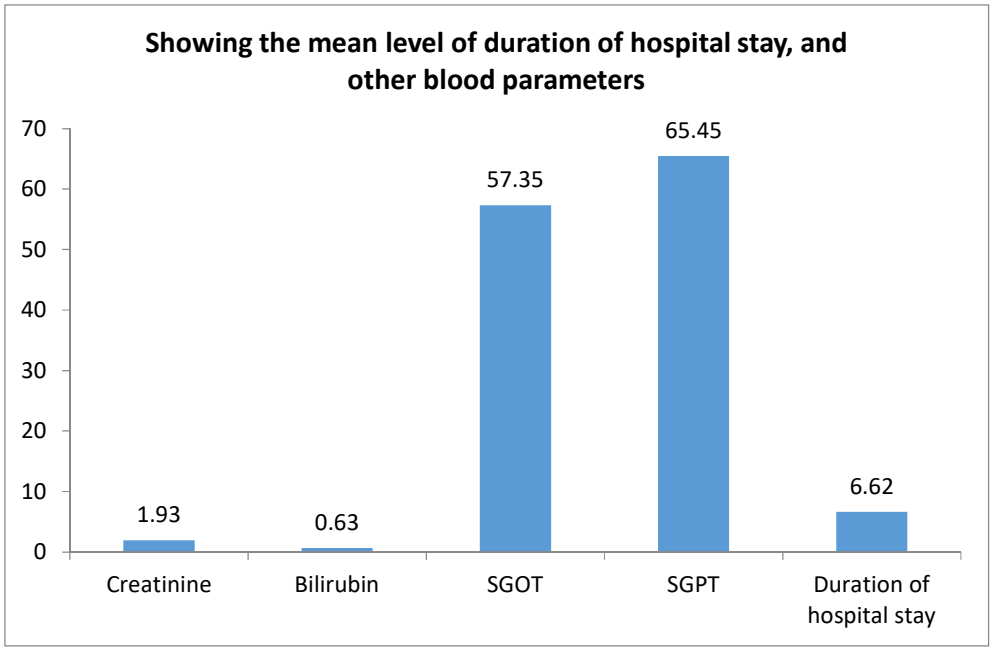

Figure 11: Showing the mean level of duration of hospital stay, and other blood parameters

Table 15: Showing the mean level of neutrophil and lymphocyte among the study participants

	MEAN	S.D.	MIN	MAX
Neutrophil %1 (n = 89)	84.71	9.35	57	97
Neutrophil % 2 (n = 35)	84.34	19.71	16	98
Lymphocyte % 1 (n = 88)	10.10	7.71	2	34
Lymphocyte % 2 (n = 34)	8.62	11.11	1	42

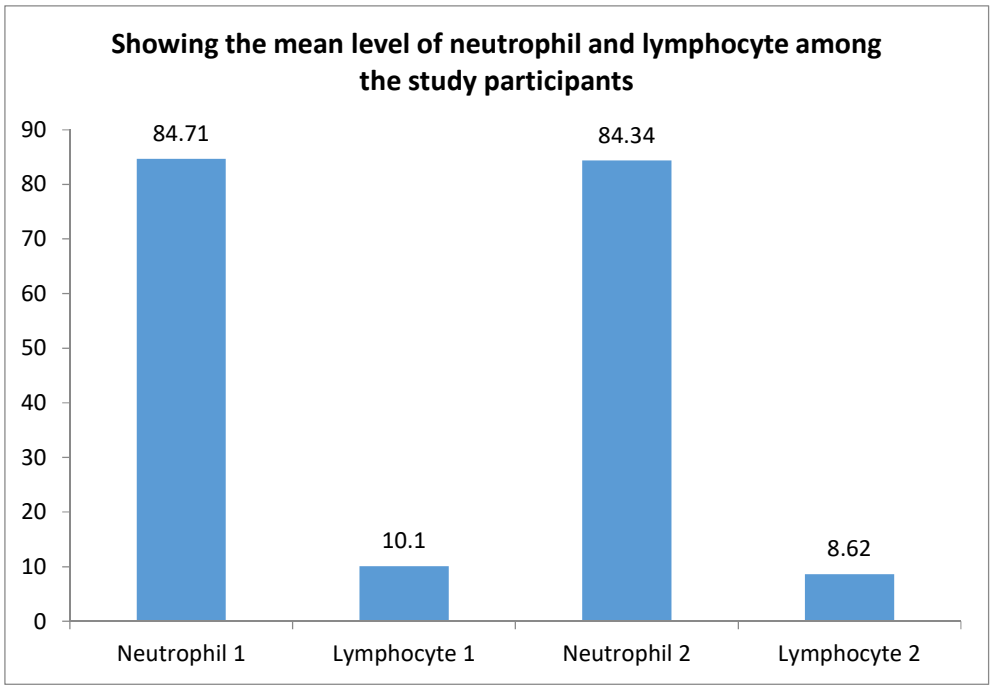

Figure 12: Showing the mean level of neutrophil and lymphocyte among the study participants

Table 16: Showing the distribution of NLR ratio among the study participants

N/L RATIO 1	NUMBER	%
< 5	13	9.63
5 – 10	29	21.48
10 – 15	11	8.15
15 – 20	10	7.41
20 – 25	8	5.93
25 – 30	0	0.00
30 – 35	12	8.89
≥ 35	4	2.96
NR	48	35.56
TOTAL	135	100.00

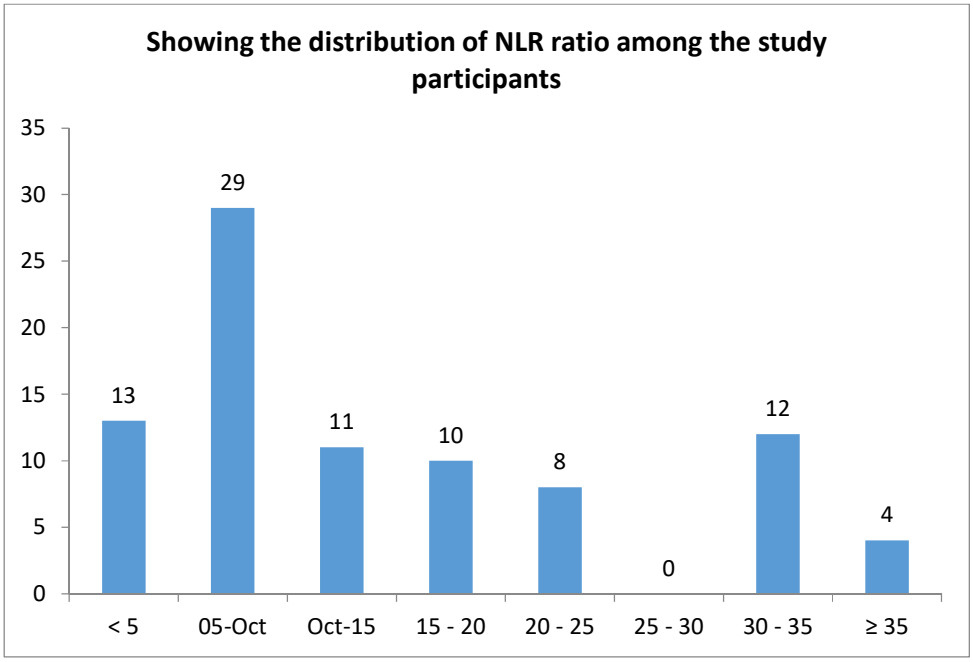

Figure 13: Showing the distribution of NLR ratio among the study participants

Table 17: Showing the mean level of NLR among the study participants

	MEAN	S.D.	MIN	MAX
N/L RATIO 1 (n = 87)	14.98	11.61	1.71	48.5
N/L RATIO 2 (n = 34)	25.98	22.9	0.89	98

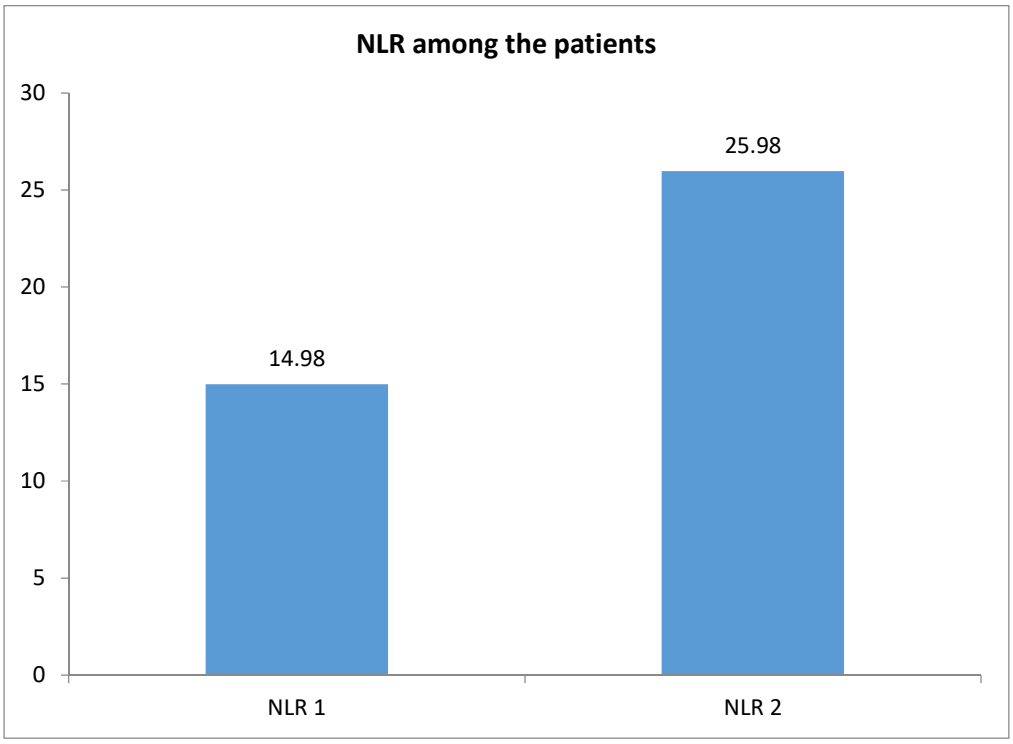

Figure 14: Showing the mean level of NLR among the study participants

Table 18: Showing the distribution of NLR among study participants

N/L RATIO 2	NUMBER	%
< 5	6	4.44
5 - 10	2	1.48
10 - 15	1	0.74
15 - 20	6	4.44
20 - 25	5	3.70
25 - 30	0	0.00
30 - 35	7	5.19
≥ 35	6	4.44
NR	102	75.56
TOTAL	135	100.00

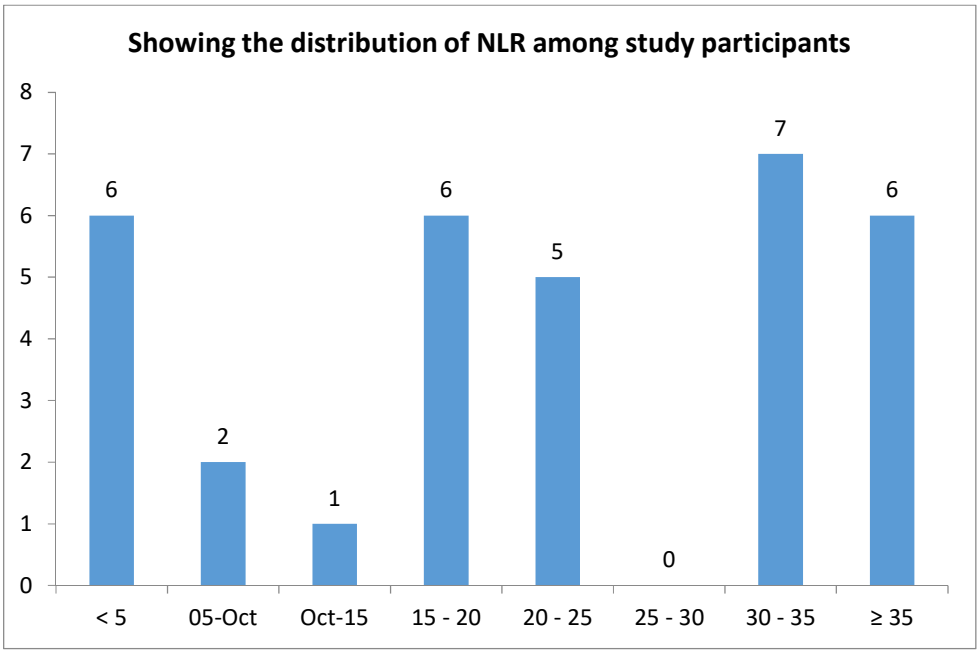

Figure 15: Showing the distribution of NLR among study participants

Table 19: Showing the mean level of platelet lymphocyte ratio among study participants

	MEAN	S.D.	MIN	MAX
PLATELET TO LYNPHOCYTE RATIO 1 (n = 84)	35.54	36.89	0.09	185.5

Table 20: Showing the distribution of PLR among the study participants

PLATELET/ L RATIO 1	NUMBER	%
0 - 10	17	12.59
10 - 20	21	15.56
20 - 30	16	11.85
30 - 40	6	4.44
40 -50	2	1.48
50 - 60	2	1.48
60 -70	5	3.70
70 - 80	5	3.70
80 - 90	2	1.48
≥ 90	8	5.93
NR	51	37.78
TOTAL	135	100.00

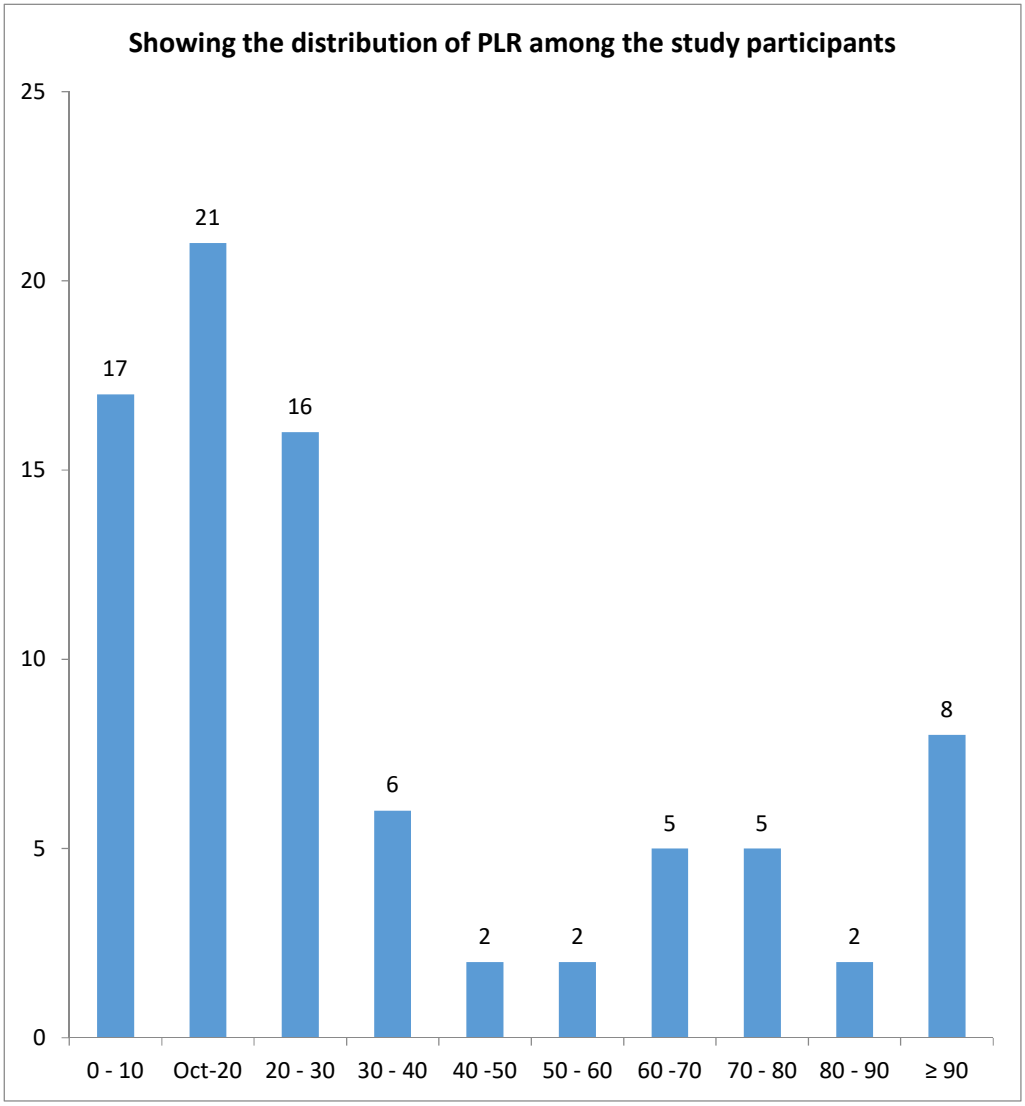

Figure 16: Showing the distribution of PLR among the study participants

DISCUSSION

The present hospital based cross sectional study was conducted among the patients admitted and getting treated for COVID-19 infection aged more than 18yrs of age. The purpose of the study was to evaluate the value of NLR and PLR in predicting the course and severity of COVID-19 in patients admitted to the Dr. Prabhakar Kore Hospital at the KLE University in Belagavi.

The bulk of the patients in the current study were between the ages of 50 and 80, with a mean age of 58.20 15.20 years. Males outnumbered females by a ratio of 3.21:1, with 76.3% of the population being male and 23.70% female. The average age of the patients is 37.7 years, and they are mostly mildly symptomatic to asymptomatic. Male patients make up 41.9% of the patient population (58.1 percent). The baseline CBC levels, NLR, and PLR between male and female patients are not statistically different, according to the 95 percent confidence range. There is a statistically significant rise in lab readings during follow-up visits. 1 Males make up a greater percentage of the population in severe instances than in less severe ones.. The age difference between the two groups is significant (p=0.022).[64]

According to a study by Qu R et al., patients with platelet peaks during therapy had longer average hospital stays than those without them (P 0.05). Patients who experienced platelet peaks during medication on average were older than patients who did not (P0.05). Patients whose platelets dramatically increased with therapy stayed in the hospital longer on average. Additionally, the average number of hospital days was longer in individuals with higher PLR during therapy.[2]

Cough, fever, shortness of breath, myalgias, loss of smell, and loss of taste were studied. According to Ozsari S's research, fever was seen in 88 out of 203 patients (43%), along with cough, dyspnea, and non-respiratory symptoms in 34 (17%) and 41 (20%) patients, respectively. In our study, additional symptoms included joint discomfort (1%), headache (1%), sore throat (1%), anosmia (2%), diarrhoea (1%), and weakness (4%)[68]

According to the report, an average hospital stay was 6.62 days. The bilirubin was 0.63, the creatinine was 1.93 mg/dl, and the SGOT and SGLT values were within the normal range. According to Seyit M et alresearch, .'s COVID-19 positive patients had significantly greater levels of CRP, LDH, PLR, and NLR, while COVID-19 negative patients continued to have significantly higher levels of eosinophils, lymphocytes, and platelets. 60 Beginning on day 5 after hospitalisation, a study by Seyit M et al. found a positive association between NLR and the length of hospitalisation, indicating that NLR was slightly correlated with hospitalisation days and implicated in predicting the outcome of COVID-19 patients. [60]

The neutrophil and lymphocyte counts in the study were within normal limits. With the NLR at 14.98 11.61, 25.98 was higher. Patients with COVID-19 have higher mean NLR and PLR levels, which is associated with patient mortality. The amount of platelets and their dynamic changes throughout treatment may be able to predict the severity and prognosis of the disease, according to a single-center case series of 30 hospitalised COVID-19 patients at Huizhou Municipal Central Hospital. The patient's dramatically higher platelets and longer-than-average hospital stay may be linked to the cytokine storm. The PLR of patients, which can serve as a novel indicator in the monitoring of COVID-19 patients, shows the intensity of the cytokine storm.[2]

According to Zhu C et al research, .'s adding these parameters to a linear model could result in biassed results because NLR/PLR should have a nonlinear relationship with results. For instance, we predicted an unadjusted link between NLR/PLR and death in critically ill patients with lung infection using information from the MIMIC database. The non-linear connection, despite the fact that the cohort in the current study is different, in some respects supports our claim. If so, the predictive usefulness of NLR/PLR in AUC may be compromised because both high and low NLR/PLR were linked to higher mortality61 Jimeno S and other people Older patients (P = 0.002), those with considerably higher NLR upon admission (P = 0.001), higher rises in Peak NLR (P = 0.001), and patients with a faster rate of NLR growth (P = 0.003) were the patients who had worse outcomes in comparison to those who received follow-up therapy. By using multivariable logistic regression, it was discovered that death was significantly correlated with age, cardiovascular disease, C-reactive protein upon admission, and Peak NLR. Continuous monitoring of NLR, an easily measurable, widely available, reasonably priced, and trustworthy indication, could aid in the detection and management of COVID-19. [62]

According to Nalbant A. et al., their study had an NLR of 2.4, an AUC value of 0.660 (P=0.021), a sensitivity of 69.01 percent, a specificity of 65.40 percent, an LR+ and LR- of 1.98 and 0.48, a PPV of 80.43 percent, and an NPV of 50.00 percent. When NLR was 2.4 (P=0.007), the logistic regression revealed that the probability of COVID-19 was 20.3-fold higher. NLR is a reliable indicator for the diagnosis of COVID-19.[63]

Huang S et al., severe patients had more comorbidities than non-severe patients, including hypertension, diabetes, chronic obstructive pulmonary disease, and fatty liver. The difference between NLR and PLR was significant ($p<0.001$). Patients with severe COVID-19 disease were much more likely to have diabetes, fatty liver, coronary heart disease, or NLR. Patients in the severe group had NLRs that were 1.729 times higher than those in the non-severe group. For patients with severe COVID-19, NLR is a separate risk factor. PLR and NLR were significantly different between individuals with severe and mild conditions, suggesting that measuring PLR and NLR may help identify COVID-19 patients at high risk..[64]

Some studies demonstrate the PLR and NLR are reliable markers of immune mediated, metabolic, prothrombotic and neoplastic disease. The fluctuations are related to immune inflammatory reactions and correlate positively with other markers of inflammation like CRP.[62]

CONCLUSION

The COVID-19 is a disease with a wide range of clinical signs that is quickly spreading. The number of coexisting conditions, as well as the haematological parameters, were associated to the disease's severity. The NLR and PLR are much greater when predicting the patients' outcomes. Among patients whose NLR and PLR mean levels correlated with other markers, they were greater on average. When employed in continuous monitoring, NLR and PLR are simple to measure, accessible, affordable, and reliable metrics that could aid in COVID-19 therapy outcome prediction.

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ANNEXURE I – CONSENT FORM

TITLE OF RESEARCH STUDY:

"**SIGNIFICANCE OF NEUTROPHIL TO LYMPHOCYTE RATIO AND PLATELET TO LYMPHOCYTE RATIO FOR PREDICTING CLINICAL OUTCOME AND SEVERITY IN COVID 19 PATIENTS ADMITTED IN DR. PRABHAKAR KORE HOSPITAL; KLE UNIVERSITY BELAGAVI"**

Principal Investigator: -

DR. MOHAMMAD SHAN ANSARI
Post graduate student,
Department of General Medicine,
JNMC, Belgavi.

Guide: -

Dr. RAJU H. BADIGER
Professor, Dept. of General Medicine
JNMC-Belagavi.

Introduction and Purpose: - Hyponatremia has been shown to be a predictor of CVS mortality among patients with heart failure. Hyponatremia is common after Myocardial Infarction and clinical outcome is accompanied by rise in plasma sodium concentration. This study is being undertaken to determine the incidence of hyponatremia in setting of Acute ST Elevation MI and determine its effect on the outcome

PROCEDURE:

If you agree to be part of the research study, you will be asked the relevant history and will be subjected to relevant clinical examination and investigations. You will also have to give blood for the necessary investigations.

Risk and Benefits:

The only risk and possible discomfort you might get is while taking blood from your arm for the investigations. It may cause swelling, pain, redness (rarely happens) at the site from where the blood is drawn.

You may not be benefitted by these investigations but you will be part of this study which is going to be useful to others in the future.

Alternatives:

Taking part in this study is voluntary. You may choose not to take part in this study.

If you decide to take part and later change your mind to withdraw from the study. Your decision will not change the present or future health care or other services that you receive. The study doctor or sponsor may stop your participation in this study at any time. If you choose not to take part in the study, you will receive the standard treatment for patients for your condition.

Privacy and Confidentiality:

All information collected about you during the course of this study will be kept confidential to the extent permitted by law. The code numbers will identify you in this research record. Information from this study may be published but your identity will be confidential in any publication.

Institution / Sponsor's policy:

Does not apply to this research

Financial incentives for participation:

No additional costs shall be incurred upon you for the purpose of this study.

Its purely being done with the idea of research and all the cost of the study will be borne by the investigator.

Authorization to publish the results:

The results of the study would be forwarded to the KLE University, Belagavi as part of requirement towards the completion of MD degree, review and publication.

In case of the queries during study or in future you may contact following persons

1. **Dr. MOHAMMAD SHAN ANSARI**
   Investigator
   Post Graduate Student,
   Department of General Medicine,
   JNMC, Belagavi.
2. **Dr. RAJU H. BADIGER**
   Professor, Dept. of General Medicine
   JNMC-Belagavi.
3. **Dr. HARSHA HEGDE**
   Head of Ethical Committee for Human Research
   JNMC, Belagavi

CONSENT FORM

I voluntarily agree to take part in this study by signing below. I may withdraw at any time. I am not giving up any of my legal rights by signing this form. My signature below indicates that I have read this consent form, or it has Been read to me, this consent form and have had all the questions answered

Signature / Left Thumb print of the Participant or legally authorized representative

Participant's name: _____

Signature / Left thumb impression: _____

of the participant

Name of the legally authorized _____

representative / guardian

Signature / Left thumb impression: _____

Witness' name: _____

Signature / Left thumb impression: _____

Investigator's name and signature: _____

ANNEXURE II – PROFORMA

SIGNIFICANCE OF NEUTROPHIL TO LYMPHOCYTE RATIO AND PLATELET TO LYMPHOCYTE RATIO FOR PREDICTING CLINICAL OUTCOME AND SEVERITY IN COVID 19 PATIENTS ADMITTED IN DR. PRABHAKAR KORE HOSPITAL; KLE UNIVERSITY BELAGAVI

CASE NO: _____

NAME: _____

AGE/SEX: _____

IP NO.: _____

ADDRESS: _____

OCCUPATION: _____

COMPLAINTS AT PRESENTATION: _____

_____
_____

PAST HISTORY:_____

_____

_____
_____

FAMILY HISTORY:_____ _____

_____

PERSONAL HISTORY:_____

_____

TREATMENT HISTORY:_____ _____

_____

_____

PHYSICAL EXAMINATION:_____

_____

GENERAL CONDITION:_____ _____

_____

_____

PALLOR- YES/NO:_____ _____

ICTERUS-YES/NO:_____ _____

LYMPHADENOPATHY-YES/NO:_____ _____

CYANOSIS- YES/NO:_____ _____

CLUBBING-YES/NO:_____ _____

EDEMA-YES/NO:_____ _____

VITALS:_____ _____

TEMPERATURE: _____

PULSE:_____ _____

RESPIRATORY RATE: _____

BLOOD PRESSURE:_____ _____

SYSTEMIC EXAMINATION:_____ _____

R. S.: _____

C.V.S.:_____ _____

P.A.: _____

C.N.S.:_____ _____

INVESTIGATIONS:

HB –	**T. BILIRUBIN -**
NEUTROPHILS –	**D.BILIRUBIN-**
LYMPHOCYTES-	**ALBUMIN -**
PLATELET COUNT-	**ALP –**
PCV–	**SGOT -**
RBC-	**SGPT -**
WBC -	**INR –**
ESR-	**Creatinine –**
Monocytes -	**Urea -**
Eosinophils -	
Basophils –	

ANNEXURE III –MASTER CHART

S.NO	patient name	IP No	Date of Admission	AGE	Sex	Symptoms (C=cough; F=Fever; B=breathlessness; M=Myalgia, Loss of smell=LS; Loss of taste=LT)	Time to hospital from symptom onset (Days)	Admission Respiratory rate (RR/min)	Admission SPO2	Admission O2 modalityn (RBM,HFO, NIV, Ventilator)	Admission FiO2	Co-morbidites	CT severity score(~/25)	Hb 1	Hb2	Hb3	Hb 5 (mention date)	TLC1	TLC2	TLC3	NEUTROPHIL %1	NEUTORPHIL%2	Lymhocyte % 1	Lynphocyte % 2	Platelets	Platelets	Ferritin	Ferritin	LDH	LDH	LDH	CRP	CRP	hsCRP	IL-6	IL-6	IL-6	d-Dimer	d-Dimer	Urea	Urea	Creatinine	Creatinine	Bilirubin	SGOT	SGPT	RBS	HbA1c
1	PARVATHI KUMBAR	1047871	05-04-2021	55	F	c,f,b			80%	RBM		HTN	14/25	9.6				21.4		24.6					371			1404	491						140.3		173.6	113.4	878	1267	79		1.55						
2	PRACHI YAUDE	1049630	18-04-2021	38	F	C,F			93	RA			Apr-25	12.7				13.5			90		5		234		210							65.6	135.7				349	26		0.6						6.3
3	LAGAMAVVA KAPASE	1050596	25-04-2021	65	F	C,M			90	O2 MASK		DM		11.8		12.6		6.7		14.4	71		25		219		1156			678				212		103		1052		42		1.22			84	39		10.9
4	VIJAYA PATIL	1051160	30-04-2021	78	F	C,B			92	O2 MASK		DM	Jun-25	13.6		14.9		16.7			93		5		231									189		15.97		822							27			
5	MALLIKARJUN LANGOTI	1051382	03-05-2021	39	M	c,f,b			95	RA				13.3											156		1088		571					133.9				540		13		1.06			54	34		
6	KAVITA DARAJASHETTI	1041923	01-03-2021	70	F	C						DM,HTN,IHD		10.8	10.7			11.1	14.8		87	95	11	2	339													34		0.97	0.7					11.3
7	RAMESH TIGADI	1050677	26-04-2021	53	M	F,B			90	O2 MASK 15L			23/25	11.7														1033					186	5000			>5000									
8	SHANTA NANA PATIL	1049991	20-04-2021	62	F	C,M,B						HTN,HYPOTHYROID,ALLERGIC BRONCHITIS		10.8	12.3			8.9	14.8		95	95	3	3	187	226	548							145.3	50.05			6520			33	0.47	0.43		25	18		
9	DEVENDRA BADIGER	1051066	30-04-2021	44	M	F,B,M			84	O2 MASK 15L		DM	15/25	14.3	14.7			8.7	12.7		90	93	8	4	236	240	14954	6653	589	690				292.5		34.76		1180	460					0.2	67			10.7
11	HEMALATHA PATIL	1050812	27-04-2021	68	M	F,M			70			DM,HTN,HYPOTHYROIDISM						10.1	12		81	16	16	18	432	478	251.4	362.4	502	572				15.2	14.73			452	1383					0.54	17	12		13.2
12	SUDHIR THUKURAM CHOUGALE	1050532	24-04-2021	32	M	F,M	3	23	80	O2 MASK			Oct-25	13				11			87				433		3233		323					322				2233		112		2.7		0.18	34	43		
13	SATHUPPA KAMBLE	1050018	20-04-2021	45	M	C,B,M,	2	30	81	MASK O2		DM	Oct-25																																		
14	SHUBADHRA G	1049154	14-04-2021	78	F	B,C	4	28	93	HFO		HTN		13.5	13			13.8	10.4		94	93	3	4	286	252	332	608	573	704				10	24.8	39.88		330	438	93			1.21	0.47	56	30		
15	PARAPPA NASHI	1050729	26-Apr	91	M	C,F	5		86	MASK O2		HTN		11.6	11.2				10.7						27	50	195							163.2	156.9					60		1.18		0.33	62	25		
16	LAXMAN DANDIN	1050909	28-Apr	72	M	B			96	NIV	100	DM HTN	22/25	14				12.2			88		10		189		1120		803					246.5	2222			1381		138		2.21		0.97	68	45		10.7
17	SIDDHAPPA BELKINDI	1050486	24-Apr	76	M	C,B,F	10		95	O2 MASK		DM HTN	20/25	15.5				15.8			92		2		326		822.3							148.8						88		1.06		0.53	15	22		
18	GURUDATTA NAYAK	1051223	01-May	64	M	BCF			91	RA		ESRD,DM,HTN,HBSAG+,CLD		10.1				15.3			88		6		140															6.95						
19	ASHOK PATIL	1050815	27-Apr	71	M	F	8		90	RA		HTN,COPD		13.9				12.7			73		20		209		1286							184.9	183.3			890		79		1.28						
20	MARUTI HUDDAR	1051400	03-May	75	M	B,C	2		100	CPAP	60	POST COVID HTN DM		12				6200			93		4		1.11		902.9		326					869.3	5000			1096		45		1.58		1.3	33	40		10.6
21	KRISHNA TERAGAON	1050966	28-Apr	82	M	C,B	5		75	MASK O2		DM,IHD,HYPERTHYROIDISM	14/25	13.6				17.9			90		4		316		1146		785					153	309.6			670		65		1.35		0.43	77	61		
22	BASAVVA HANAKUPPI	1048424	08-Apr	71	M	F,B,M	2		100	CPAP	80	DM,HTN		10.5				12							2.24		683.3		686					113.8	541.5			552		94		2.44		0.25	49	21		
23	MOHAMMAD PATAGON	1051151	30-Apr	73	M	F,C,B	5	28	98	RA		DM,HTN,CKD		10							94		3		206		2780		986						160			5000					7.33						
24	SHANTA NAIKA	1051170	30-Apr	65	F	F,M	2	32	83	NIV		DM,HTN																																				
25	MURGEPPA DHARMAGOUDA PATIL	1051502	04-May	78	M	F,C,B	4	26	96																																							
26	SHAILA BEKAMADKAR	1049657	18-Apr	48	F	C,B	5	32	88	HFO		DM,HTN		10.9							81		12		257		261.9		440						174.4			880										
27	SURESH NAIK	1050035	20-Apr	69	M	F,C,B	2	33	80	HFO				13.3	12			13.5	15.7		91	95	3	2	173	90	691								12.88			5000										
28	SANDEEP KINEKAR	1049018	13-Apr	39	M	F,C,B,M			94			DM,HTN		15	15.3						87	92	11	4	175	287		1483			192	145						680										
29	ASHWINI PAWAR	1050323	22-Apr	35	F	C,B			85					9.2	9.1			10.6	12.9		80	25		16			199.7	103.5	634	647					47.5	23.6		1217							45	13		
30	SADASHIV HELANI	1049564	17-Apr	42	M	C,B			50					14	14.4			13.9	29.6		87	95	9	2	340	245			798						129.3		1584	1630									
31	BASAVANNI SAMGAPPAGOL	1050163	21-Apr	76	M	B	4	33	85	HFO				14.4				19.2			90		7		432		1474							43.04				1437							44			
32	BABSAHEB	1050980	29-Apr	68	M	B	5	30	95	RBM		DM,HTN,CKD		9				4.4			80		10		130		659		268					20.9				264										
33		1050725	26-Apr	53	M	F,C	3	28	96	RBM		DM,HTN,IHD															514							101.6														
34	prabhuraj sangam	1046575	27-03-2021	69	M	C	4	19	93	RBM		DM, HTN, CKD		12	12.4			7	12.7		89	67	11	28	311	234	544	6555	544	744				655	1243	2455		453	>5000	34		3.2						
35	shivasharanayya shivayoginath	1049412	16-04-2021	54	M	C,B	6	23	87	RBM		DM		12	13			7.8	17		80	60	17	36	56	78	6544		344					544	233	2444		544	4522			1.6						
36	mayrose fernandes	1050752	27-04-2021	60	M	F,C,B	8	31	80	CPAP	60			14				8.9			89		7		123		654		43					432	788			>5000		43		0.9						
37	sidagouda patil	1047093	31-03-2021	58	M	B	5	30	91	RBM		DM,IHD,HTN		12				14			67		30		145		344		432						1244			>5000				0.8						
38	chanamma chalawadi	1050610	25-04-2021	61	M	F,B	7	24	94	RBM		DM, HTN		15	16			11	19		89	55	11	40	187	89	3442	4544	34					899	1253	5664		455	3855									
39	siddappa mali	1051048	29-04-2021	50	M	B	6	21		RBM				15	13.1			16	21.5		58		34		233		654		789						6744			1221	2442	27		1.1						
40	radha dayanand	1051179	01-05-2021	85	M	F,B	7	24	94	RBM		DM, HTN, CKD		15	16			11	19		89	52	11	42	158	90	3442	4544	34					899	1253	5664		455	3855	54	50	4.2	4.3					
41	anita ganachar	1050431	23-Apr	53	F	C,F							8	11.6				5.4			76		14		195		1247		905					56.3	2776			776		57		0.71						
42	MANOHAR KATTIMANI	1051635	06-May	60	M	F,B			84	O2		HTN	16	11.3							88		10		2.35																						
43	AANUSAIA MAHULINGPUR	1051272	02-May	65	F	C,F,B			84	RBM		DM,HTN		14				9.8			79		14		152		779.7							302				652		43		0.72						
44	SHIRAJ NADAF	1051275	02-May	67	M	C,F,B			87			HTN	16	14				9.8			79		14		152		779.7							302				652										
46	Ramappa kadappa kittur	1052511	16-05-2021	73	M	C,F,B	2	22	97	RA	100	DM	17	13.2	11.9			8.1	12.4		87	96	11	2	195	292	1121	1315		996				195	351	441.8		537	952					0.52				
47	KRISHNA BARMA METRI	1053735	28-05-2021	85	M	C,FB	7	23	72	RA	100	DM ,HTN	16	12.1				10			94		4		264		1316							23.3				740						67	38		
48	IRAWWA.SHIVAPPA .SHIRAGUPPI	1052071	10-05-2021	50	F	C.F.B	4	24	83	NIV	100		22																																		
49	PREMA PUJARI	1052689	18-05-2021	55	F	C,F,B	7	24	79	RA	100	HTN	5	11.3	10.6			6.5	13.5			94	11	4	226	129	462.3		54.3					66.2	14.23								0.35					
50	SANJU KALLAPPA KOTKAR	1053366	25-05-2021	43	M	C,F,B			50	RA			25	17.4				10.4							160													1273		45		1.17						
51	MANOHAR BARMAPPA NAIK	1052660	17-05-2021	49	M	C,F,BLS,LT			86	RA		DM	18																																		
52	SUMITRA HANCHINAL	1052351	13-05-2021	62	F	F,B	7	24	96	RA		DM	8	12				26.7	9.6						512			1691		619			43.3	130.8	10.07		632	1048	42		1.64	6.16	0.2	139		572	10.8
53	APARNA KORE	1052072	10-05-2021	40	F	C,F,B	3	24	86	O2 SUPPORT				10.6							88		6		432		121.4							93.4	1.5									0.2	18	33		
54	JAYANT DESHPANDE	1052646	17-05-2021	51	M	C,B	5	22	79	RA			18	10.2	10.6			6.6	16.8		86	93	8	3	174	359	1491	799.5		443				84	280.1	60.38		1307	5000	45		0.94		1.09	94	92	84	
55	CHANDRASHEKAR KARKI	1053126	22-05-2021	85	M	C,F,B	2	24	95	O2 MASK		DM, HTN	6	10.7				11.2			95		3						434					105.5	858.4			1013		46		1.8		0.5	74	32		
56	SHIVAJI KHULE	1052719	18-05-2021	82	M	C,B	2	36	27	NIV	100	DM,HTN	22	9.2							92		6		218		313.6							157.5	78.31			793		104	133	3.4	3.14	0.5	6.1	16	199	
57	SANJAY PATIL	1052520	16-05-2021	47	M	C,F,B	4	26	95	O2 SUPPORT				14.3		16.2		11.8		38.3	70		6		201		869.7		609					169.9	113.3				4474		33		0.55	0.48	69	53	128	
58	SHANTANU KAVATHEKAR	1051012	29-04-2021	53	M	C.F.B		24	93	RA			2	10.9	11.4						92		6		207			1172		771					75.16			653	19	45	1.13	0.7			33	26	127	
59	PRIYANKA BELAGAUN	1053692	27-05-2021	29	F	C,F		30	60	VC									14.2			90		6		129	92.03		283				87.5	133.5				773		10		0.42			49			
60	JAGADISH PATTANSHETTI	1052845	19-05-2021	35	M			22	85	NIV		DM	17	13.1				13.1			97		2		371								18.8	32.9			733										
61	VEERALAXI BALAPPA	1053951	30-05-2021	80	M	C,F,B	2	30	98	NRBM		DM, HTN																											175		3.24							
62	MALLIKARJUN BAAS	1049591	17-04-2021	56	M	C,F	3	32	90	NRBM		IHD		16.6																									67		1.15							

63	MOHANGOPAL DASALPRAKAR	1053906	29-05-2021	72	M	C,F,B			96	RA		DM,CKD,HTN	2	9.1							88		10		159		8074		698						2383			1038		167		14.04		0.42	38	16	168	
64	SALAUDIN BUSANDINKAJI	1053861	29-05-2021	42	M	C,F,B	3	33	82	HFNC	100		5																																			
65	RUKAYYA ASIF	1053925	30-05-2021	28	M	C,F,B	3	30	95	CPAP	100	CKD																																				
66	SUVARNA MAERYAN	1053141	22-05-2021	52	F	C,F,B	11	30	98	NIV	100	DM		11.4							88		8		164		1894		1197						16.99			803		18		0.41		0.64	71	42	197	
67	SHILINGAYYA HIREMATH	1053183	23-May	61	M	C,F,B	6	33		NRBM				14.3																								1486						0.25				
68	FAUSTINA XAVIER MAHELANI	1053897	29-05-2021	65	F	C,B	4	28	99	NRBM		DM, HTN	19	6.6							90		4				1165					32.9								374		5.29		0.3	23	15		
69	SIDALINGAPPA SATTEPPA	1052879	20-05-2021	65	M	C,B	7	35	98	NRBM		DM		14.6							95		3						578						59.7			481							32	34		
70	MARUTI YASHWANT	1053970	31-May	64	M	B	1	32	90	VENTILATOR	100		20	12.6											246		1121					147.2			174.8			5000		37		0.6			46	47		
71	SHRISHAIL HIREMATH	1053177	23-05-2021	69	M	B	10	35	94	NRBM		SEIZURE DISORDER		10.5	10.36						81	84	10	6	209	387		198.7	423	1592					212.7	54.45		1538	3621	45	41	0.73	0.45	0.53	27	17		
72	MANGAL KAKDE	1053688	27-05-2021	65	M	C,F,B	4	30	85	NRBM		DM,HTN, ASTHMA, SEIZURES		9.3							94		2		180				1280											418		6.5						
73	RACHAPPA SHRINGERI	1053148	22-05-2021	80	M	C,B			100	HFNC		HTN	11	16.4							88		9		168		1048		572						88.1			566		39		1.16						
74	PRADIPKUMAR BASANGOUDA PATIL	1052384	14-05-2021	56	M	C,F	7					DM,HTN	16	12.1	12.2						69	92	26	6	77	255	506	1570	449	690						14.39							9.25	0.61				
75	SADASHIV KADAPPA	1052990		71	M	C,B	4	32	100	nrbm			22	12							70		12		356		3223		749			0.19																
76	MAHESH BABU	1053211	23-05-2021	37	M	C,F,B	5	30	82	RBM			16	16.4	16.8						80	82	13	10	208	208			775	775					106			539		36		0.85		0.5	135	165	109	
77	BASANGOUDA SAHEBGOUDA	1053664	27-05-2021	78	M	C,B	5	30	97	RBM		DM	5	9.1							87		6		145		606.9		894						445.8			1486				3.01			46	32	327	
78	LAXMI HALLI	1053365	25-05-2021	76	M	C,B	7	30	97	CPAP	100	DM, HTN, IHD	22	12.7							88		9		243										249.9			5000		35		0.81		0.4	45	43	307	
79	MADDEEPA DUNDAPPA YADALLI	1052152	11-05-2021	50	M	C,B	15	28	85	HFO		DM	19																																			
80	GANESHPRASAD VILASRAO NIMBALKAR	1051816	07-05-2021	39	M	C,F,B	10	33	90%	RBM				11.7	13.7	12.8		14.3	15.9	13.2	91	92	5	5	302	307	998.4							47.9				1330		73		0.78		0.7	25	51	159	8.2
81	VINAYAK SHUBASH KHOT	1054155	01-06-2021	40	M	F,B	3	40	85	RA				12.5				12.9			86		4		69		1134		1300					119.4	478.4			>5000		182		1.21		0.9	71	37		
82	KAVITA SHIVAKUMAR KADAGAD	1052252	12-05-2021	36	F	F,B	3		90%	RBM			24	10.8	11.6	12.5		17.8	15.6	10.2	84	93	12	5	293	432		238.7		606				111.1	135.5	4.43	15.92	460	467	41	23	0.62	0.36		30	63		
83	KASHINATH LAXMAN KORE	1051698	06-05-2021	60	M				94%	RBM			2																											121		1.02						
84	VIDYA JYOTIRAO LAD	1051836	08-05-2021	54	F	C,F,B	5	26	72%	RBM			16	12.1	11.5	12.7		21.6	11.7	21.6	92	94	4	3	290	232		441.2						102.7		10.2			1379	73	83	1.01	0.69	0.35	40	15	394	
85	RAMAGOUDA KASHAPPA DESAI	6078129	03-05-2021	62	M	C,F,B			89%	RBM			17	15	15			6.3	19.4		84	92	10	3	160	204	1285								40.05			466		63	49	0.73	0.66	0.8	77	44		
86	IRAPPA BASAVANTAPPA GEDI	1052873	19-05-2021	32	M	B	6		92%	RBM			22	15.1	14.7			8.9	18.2		83	90	14	5	187	245	1384							213.5	13.27			>5000	>5000	49		0.8			38	29	207	
87	ANNASAHEB PATIL	1052343	13-05-2021	81	M	F,B	7	26	86	O2 MASK		HTN, PARKINSON	9	18.8	19				31.1		93	93	4	5	126	286	1744	1844	986	844				73.6	52.9	172.7		777	444	94		1.51		134	154	75	145	
88	SAROJINI SHIVAPPA HOSAMANI	1051393	03-05-2021	65	F	C,F,B	3	22	89	RA		HTN	5	14.3				3800			74		22		1.88				411			7.6						368.12										
89	SARFARAZ KAMANIDAR	1051716	06-05-2021	45	M	C,F,B	4	20	86	O2 MASK			18														441.1					3.8						332										
90	RAVINDRA VASTRAD	1051818	07-05-2021	72	M	C,B	2	24	92	RA		HTN	12	13				11.5			79		15		128		897.2							47.9				509		133		1.5		0.72	34	26		
91	MAHADEV DALAWAI	1052961	20-05-2021	45	M	F,B	6	22	81	O2 MASK			20	13.8				19.3							85		1437		977						977.7			>5000				0.69		0.4				
92	BABAGOUDA RUDRAGOUDA PATIL	1051507	04-05-2021	77	M	F,C,B	2	24	76	O2 MASK			16	12.8				11.2							81			95.46								9.46												
93	RAMACHANDRA ISHWAPPA AJJANAWAR	1053055	21-05-2021	79	M	FCB	7	22	60	O2 MASK			22	13.2	12.9			15.4	12.9		95	98	3	1	264	208														50		0.78		0.52	52	35		
94	VERANNA BASAVRAJ HIREMATH	1052335	13-05-2021	42	M	FCB	7	26	95	RA			6	13.4							59		33				134					6.7			150			387		22				0.36				
95	PADMAVATI NAIK	1051915	09-05-2021	68	F	FB	4	23	70	RA		DM,HTN	20	8.8				5			74		23		217		454		530											15		0.74		0.78	47	15		
96	ISHWAR SATAYAPPA	1052172	12-05-2021	83	M	F	3	27	75	RA		DM,HTN	18	13.7				9.1			69		25		100		321		421			56.8						481						0.46	98	57		
97	GIRIJA GADAKARI	18050600	25-04-2021	50	F	C,B	4	28	88%	O2 MASK			not done	10.7	11.7						82	85	15	9	236	200		483		894		78.2	51.2							21		0.57						
98	farozkhan pathan	1052380	14-05-2021	56	M	M,B	2	30	100%	RA		HTN, CKD	not done	10.4				130																					>5000									
99	Hanamanth mallapa	1052789	19-May	55	M	C,F,M,B	1	26	57%	RA			not done	16.1				19			75		4		438				825											49		0.71			25	17		
100																																																
101	BHAGIRATI LAXMAN PATIL	1052406	14-05-2021	50	M	B,M	5		92%	RBM			16/25																																			
102	ARVIND ANANT GAWADE	1053710	27-05-2021	61	M	C,F,B	5		42%	RA			15/25	10.7				14.3			95		3		297				627					163				619		19		0.99			44	20		
103	GEETA SHIVAJI PATIL	1052382	14-05-2021	60	F	F,B	2		62%	RA			18/25	12.5	13.3				12.5		68	95	25	3	165	319	470.7	555.8	982	1198				100.6					1166									
104	CHANNAVVA GOUDAPPA DODDAVIRAPPANAV	1052446	14-05-2021	58	F	C,F,B	3		49%	RBM		DM		10				13.6			90		6		89		1031		1062					95.6	39.19			>5000						0.35	64	39		11.1
105	BASAWANTAYYA CHANNABASAVAYYA HIREM	1052875	19-05-2021	102	M	F,B	12		90%	RBM				12.8				4.8			93		6		122		3490		754					183.5	17.81			1176		72		1.4		0.81	108	69		
106	MALLAPPA GURUBASAPPA GHIWARI	1053158	22-05-2021	59	M	B,	3	60	38%	RA			22/25	13.6				34.7			93		3		416		2055		1833					48.3	104			6997		66		0.85		0.88	813	449	481	
107	RAHUL JEEVAN BABALESHWAR	1052033	09-05-2021	24	M	C,F,B	5		66%	RA			14/25		15				16.2			92		4		292	3289							38.7	1243			670		56		0.84		1.36	47	76		6.5
108	AKKATAI YALLAPPA BELGAONKAR	1053329	24-05-2021	55	F	C,F,B	5		88%	RA		DM, HTN	17/25	11.1	10.1			14.9	22		83		15		322	385	376.8	447	331	592				126.7	209.3	177.2		349	570	35		0.46					296	
109	PRASHANT KORI	1052121	11-05-2021	44	M	C	2		93%	RA		DM	16/25														3107		892					70.9	9.21					48	170	0.67	6.3	0.39		29		
110	SHAILAJA KAMBLE	1051942	09-05-2021	35	F	M	5		100%	RA		CVA	Feb-25																																			
111	FAUTINO A COUTINO	1052170	12-05-2021	77	M	C, F	1		60%	RA		DM HTN CKD		8.9				18100							183															19.9		6.85						
112	VIJAY KULKARNI	1051607	05-05-2021	38	M	C F P	2		94%	RA			Sep-25	12.4				9.4							14		3520							326						55		1.06						
113	REKHA KAMBLE	1052117	11-05-2021	47	F		8					DM	May-25	12.2				11.3							239															20	12	0.5	0.5	0.14	11	18		
114	GURUPRASAD DESAI	1052256	12-05-2021	45	M	P	14		64%	RA			Jun-25	13.8				24.2							261									12.5						65		0.91						
115	BASAVRAJ HOSAMANI	1050972	29-04-2021	30	M	C M	4		96%	RA				11.2	11										110	193	5870		385					80.7	57.36			1769			139		2.33					
116	BIPIN N JAKARTI	1051662	06-05-2021	50	M	B	1		50%	RA		DM HTN	22/25	10.6	10.06			14.7	20.6						192	107	61.37	76						22.6				205	832						53	56		
117	RAMACHANDRA PATIL	1051674	06-05-2021	55	M	B M	2		85%	RA		DM	13/25	12.4													925		561					160.7				318		30		1.24		0.34	105	38		
118	RAMACHANDRA BALOBAL	1053345	25-05-2021	68	M	B	15		96%	RA		DM	25/25	13.8				20.2							50															74	88	1.18	1.04	0.59	33	30		
119	ASHOK PAWASHE	1052510	16-05-2021	67	M	CFB	12		50%	RA		HTN	18/25	12.2				9000							244		14885			1095				315.4				5000		121		1.14		0.85	273	139		
120	BHIMAPPA HEBBA;	1053207	23-05-2021	58	M	M	1		100	RA			Jan-25	14.2	12.6			11.4							237									139.7				561		22		0.88		1.8	25	34		
121	RAJU AGGER	1051809	07-05-2021	55	M	C B	5		80%	RA			23/25	15.6	13.6			12.5	18.2						426			1404	796					435														
122	VASANT METRI	1052491	15-05-2021	55	M	C F B			95%	RA																																						
123	JAYASHREE KONNUR	1051115	30-04-2021	52	F	C B	5		54%	RA		DM HTN	Oct-25	12.7											201		467	431.4	427					71.3				431		53		0.61		0.3	22	21		
124	SANJAY PATIL	1050760	18-04-2021	42	M	C M	7	32	87				20	13.6	13.6			24.7	24.7		90	90	6		117		2323	2323						28		297				60		0.97		3.32	91.4	92	112	
125	PRABHAKAR KATANBLE	1052352	13-05-2021	67	M	C F B	6	25	65			DM IHD	20	11.5	12.5			9.7	21.5		95	98	3	1	214	181	1327	5231	542					201.9				7500	6996	64	66	0.88	0.99		44	70	460	
126	LAXMAN GAUDA ASHOK PATIL	1052677	18-05-2021	28	M	C F B	1		36	VENTILATOR		DM HTN																																				
127	SAYED THANGAL	1050923	28-04-2021	57	M	C F B	7	30	43			DM HTN		16.3	14.4			7.8	15.1		88		6		172	89	3873		797	1093				123.3				482			36		0.73	0.48				
128	MANOHAR GALLI CHIKORI	1051635	06-05-2021	60	M	C B	2	31	87			DM HTN	16	11.9	12.7						90	90	7	3	108	184														72		1.66					460	
129	PAVANANJAY KALLIMANI	1051473	04-05-2021	62	M	C B	7		96					7.8	8.8			2.9	9.9		57	93	31	5	45	117	1082		271					12.2				581	758	43		5.52		0.36	36	10	370	8.6
130	DHEERAJ NADAF	1051275	02-05-2021	67	M	F B	6	24	89		136	HTN		11.3				4.5			88		10		2.35																							
131	BHARAT KUMAR JOSHI	1052759	18-05-2021	46	M	B	1							14.5				34			94		2		2.21		2229											1224		71		0.58		0.97	89	52	150	
132	MANGALA SHANKAR MANAGAVI	1051504	04-05-2021	48	M	C F B			89			HTN	22	10.2							74		22		191		276.4		420					136.9	30			43		34		0.79			37	24	219	7.4
133	PRERNA VASUDAVE KULKARNI	1052374	10-05-2021	72	M	B	5		91					8.6							79		12		113		178.8							237.9	250.2			1234		64		0.65				1265		
134	VISHWANATH RAVINDRA VASTRAD	1051613	05-05-2021	47	M	C F B	5		41				13-14/25	15.6				13			94		4						769					2.2				1309		89		0.57			64	17	206	
135	MAHMADISMAIL BANDAGISAT KORABU	1051725	06-05-2021	48	M	B	5		100			DM HTN H/O RENAL TRANSPLANT	9	12.9							63		4		379		2000											722		32		0.76			60	30		
136	UTTAM MEGHA TIKKEKR	1052216	12-05-2021	55	M	C B	1		88			HTN CKD		17.2							90		3		222				890					236.9	253.4			767		224		21.74			52	25	114	
137	SARITA SUBHAS JALIHAL	1052120	11-05-2021	57	F	C F	8		88-89			DM HTN	16	11.8				6.6											788			147.5																
138	VIJAY LAXMI NAYAK	1052232	12-05-2021	52	F	B	4	21	98	NRM	58.8	RVDM POSITIVE	21	10.7	10.4			10.3	30.8		91	93	3	3	161	168	247.9	1299	476	3044				46.6 AND 320		142.5		9.7						0.28	34	34		