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**"STUDY OF CORRELATION BETWEEN LABORATORY  
BLOOD BIOMARKERS AT THE TIME OF ADMISSION WITH  
DISEASE SEVERITY AND FINAL CLINICAL OUTCOME IN  
COVID 19 PATIENTS AT KLE DR PRABHAKAR KORE  
HOSPITAL" - ONE YEAR HOSPITAL BASED CROSS  
SECTIONAL STUDY.**

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**BY**

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**of the requirements for the degree of**

**M.D.**

**IN**

**GENERAL MEDICINE**

**J. N. MEDICAL COLLEGE**

**BELAGAVI- 590010. KARNATAKA**

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**JUNE / JULY - 2023**


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With reference to the above, we wish to inform you that your proposed research project titled "STUDY OF CORRELATION BETWEEN LABORATORY BLOOD BIOMARKERS AT THE TIME OF ADMISSION WITH FINAL CLINICAL OUTCOME IN COVID-19 PATIENTS AT KLE DR PRABHAKAR KORE HOSPITAL" - A ONE YEAR HOSPITAL-BASED CROSS-SECTIONAL STUDY, is ethical and justifiable. The proposed research project has been cleared by the JNMU Institutional Ethics Committee on Human Subjects Research.

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**“STUDY OF CORRELATION BETWEEN LABORATORY BLOOD BIOMARKERS AT THE TIME OF ADMISSION WITH DISEASE SEVERITY AND FINAL CLINICAL OUTCOME IN COVID 19 PATIENTS AT KLE DR PRABHAKAR KORE HOSPITAL” - ONE YEAR HOSPITAL BASED CROSS SECTIONAL STUDY”**

**ABSTRACT**

**AIM:**

To evaluate the association of inflammatory biomarkers HsCRP, IL6, Serum ferritin, D-dimer, LDH with disease severity, and final outcome in terms of survival or death.

To determine the serum levels of inflammatory markers that can predict the likely of developing severe disease.

**Methods:** Clinical data of laboratory confirmed 532 COVID-19 positive patients including detailed history of symptoms associated, oxygenation parameters, laboratory biomarker levels of IL-6, D DIMER, CRP, LDH, SR FERRITIN was noted at the time of admission and disease progression was recorded. The correlation between admission biomarkers with severity and final outcome were evaluated by Logistic regression and Receiver operating characteristic (ROC) curve.

**Results:** Out of 532 COVID-19 positive patients, 315(59.21%) had mild COVID, 117 (21.99%) had moderate COVID and 100(18.8%) had severe COVID symptoms. 37.59% subjects had DM, 31.02% had HTN and 8.65% had IHD. Majority (81.2%) of the patients survived whereas 18.8% died. Factors like age, gender, comorbidity, symptoms, PSO<sub>2</sub>, ferritin, LDH, HsCRP and D-dimer values at the time of admission were found to be significantly associated with severity of disease. The

estimated optimum cut off values for ferritin LDH, HsCRP, D-dimer and IL-6 were > 437.1ng/mL, >415U/L, >85.6 mg/L, >654ng/mL and >42.8pg/mL respectively. Early identification of patients who would develop severe grade of disease and active initiation of treatment showed increase in recovery and survival rates.

**Conclusion:** Assessing and monitoring the biomarkers IL-6, D-dimer, CRP, LDH, FERRITIN levels at the early stage of disease will have a considerable effect in halting disease progression and reducing mortality rate.

## ABBREVIATIONS

- LDH : Lactate Dehydrogenase
- HsCRP : High sensitive C reactive Protein
- IL6 : Interleukin 6
- COVID 19 : Corona Virus disease 19
- RR : Respiratory Rate
- IHD : Ischemic heart Disease
- HTN : Hypertension
- DM : Diabetes Mellitus
- ALD : Alcoholic Liver Disease
- PPV : POSITIVE Predictive Value
- NPV : Negative Predictive Value
- HFNC : High Flow Nasal Canula
- Spo2 : Saturation of Peripheral Oxygen

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## **INTRODUCTION**

Corona virus- 2019 disease (COVID-19), caused by the novel Coronavirus SARS-CoV-2 was first reported from Wuhan, China in December 2019<sup>1</sup>. On 11 March 2020, this fast-spreading epidemic was declared a global pandemic by the World Health Organization (WHO). Since then, it has spread rapidly around the world exerting enormous pressure on healthcare systems. More than 608 million confirmed cases worldwide were recorded as of September 16, 2022, causing more than 6.5 million deaths<sup>2</sup>.

The clinical course of COVID-19 infection is unpredictable, although it tends to start with a fever or mild upper respiratory symptoms, majority of patients tend to be asymptomatic. The symptoms progress rapidly in high-risk patients, who are more likely to develop severe viral pneumonia, which necessitates hospitalization, mechanical ventilation and ICU admissions<sup>3</sup>.

Therefore, identifying the indicators of diseases severity is need of the hour. At present, researchers around the world are focussed on identification of indicators of disease severity in COVID-19 patients, which will further aid in disease categorization and identifying high risk patients in order to get medical assistance effectively<sup>4</sup>. Assessing early predictors of disease severity and outcome is critical for providing preventive treatments particularly in economically developing countries where ICU facilities may not be able to keep up with the rising demand for services.

Different clinical, laboratory, and radiologic markers that potentially predict disease severity have been identified with varied outcomes due to the fluctuating behaviour of the disease and geographical disparity<sup>5</sup>. Among these, laboratory

biomarkers are very economical and can be accessible quickly, hence they are preferred to predict and monitor prognosis and outcome of the disease<sup>6</sup>.

Some of the laboratory markers beneficial for assessing the disease severity among COVID-19 patients include: Inflammatory markers like C Reactive protein (CRP), Erythrocyte sedimentation rate (ESR), Ferritin, Lactose dehydrogenase (LDH), Cytokines and chemokines; Cardiac biomarkers such as N-terminal-proB-type Natriuretic Peptide (NT-proBNP) and, Troponin; Coagulation markers such as prothrombin time (PT), partial thromboplastin time (PTT), fibrin degradation products (FDP), Fibrinogen, and D-dimers; and Haematological markers such as Leucocytosis, lymphopenia, Neutrophilia<sup>7</sup>.

Raised levels of inflammatory markers including CRP, procalcitonin (PCT), IL-6, ESR, Serum Amyloid A (SAA) and serum ferritin were reported in COVID-19 patients of severe group when compared to non-severe group<sup>8</sup>. Coagulation dysfunction was linked to the severity of COVID19 patients, with low platelet, high Ddimer, and fibrinogen levels on admission to the hospitals serving as risk markers for disease severity<sup>9</sup>.

With this background the present study was undertaken to evaluate the correlation between the most commonly used markers HsCRP, IL6, Serum ferritin, D-dimer, LDH with disease severity, prognosis and final clinical outcome. The results of our study will further strengthen the available evidence on correlation between laboratory biomarkers and COVID-19 severity and assist medical practitioners to categorise and treat patients based on disease severity at the earlier stages of disease, so as to reduce and prevent morbidity and mortality.

## **AIMS AND OBJECTIVES**

- To evaluate the association of inflammatory biomarkers HsCRP, IL6, Serum ferritin, D-dimer, LDH with disease severity, and final outcome in terms of survival or death.
- To determine the serum levels of inflammatory markers that can predict the likely of developing severe disease.

## **REVIEW OF LITERATURE**

Coronaviruses comprise a diverse group of viruses infecting broad range of hosts causing features ranging from mild cold to severe, fatal disease. Over the past 2 decades we have witnessed significant outbreaks around the world such as severe acute respiratory syndrome of 2002, middle east respiratory syndrome of 2012. The recent novel coronavirus, severe acute respiratory syndrome corona virus 2, emerged in late 2019 is the longest outbreak and is considered a global pandemic<sup>10</sup>.

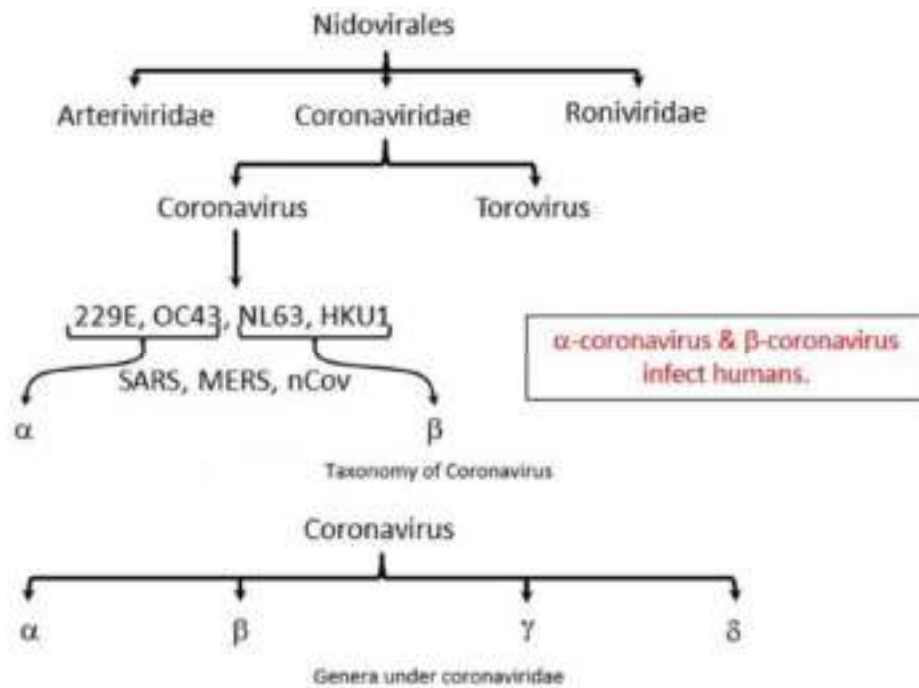
### **Epidemiology and History of COVID-19 disease**

In December 2019, Wuhan city, Hubei province, China witnessed some new cases of pneumonia with unknown aetiology. The causative organism was identified and named as SARS-CoV-2 by the Chinese Centre for Disease Control and Prevention (CCDC) in January 2020<sup>11</sup>. The disease was subsequently named as novel Coronavirus disease 2019 (COVID-19) by World Health Organization<sup>12</sup>. Within few months the disease spread rapidly across China and across countries around the world with a case fatality rate of 2.2%<sup>13</sup>. By March 2020, WHO declared COVID-19 outbreak as global pandemic<sup>14</sup>.

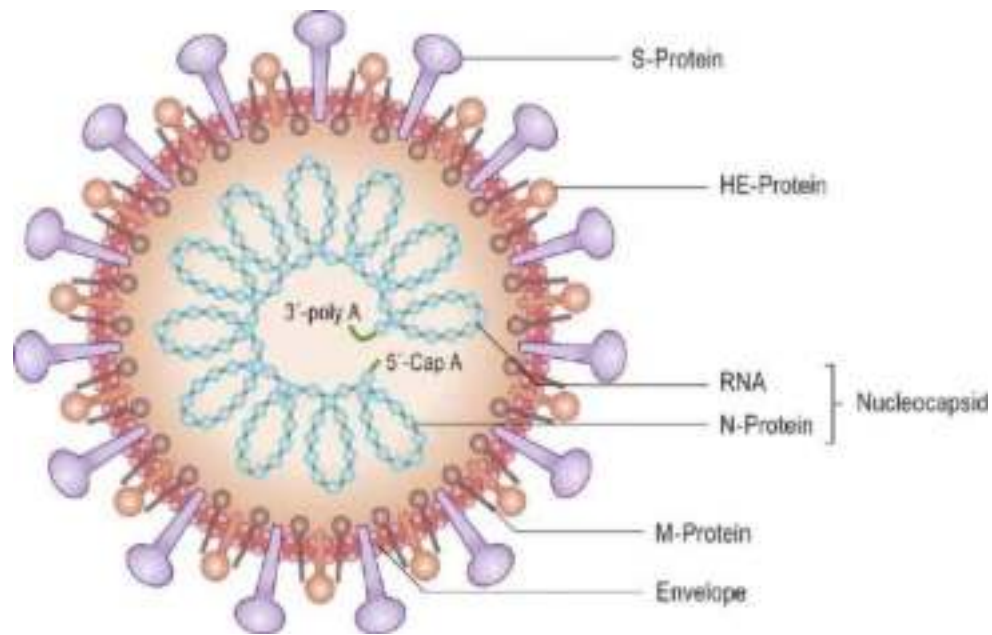
As of 16 September 2022, WHO reports 608,328,548 confirmed COVID-19 cases and 6,501,469 deaths due to COVID-19 globally. In India, there are 44,522,777 confirmed cases of COVID-19 including 528,273 reported deaths<sup>2</sup>. Although the current infectivity rate is controlled due to ongoing vaccination programs, the country is still witnessing the occurrence new cases and deaths even today.

**Structure classification of Corona virus**

Coronaviruses belong to the order Nidovirales, family *Coronaviridae* and subfamily *Orthocoronavirinae* (Figure 1). Based on the genetic and antigenic criteria, coronavirus is further classified into alpha, beta gamma and delta variants. Coronaviruses are spherical in shape and approximately 125 nm in diameter with genomic sizes range from 26kb to 32kb in length<sup>15,16</sup>. They contain an unsegmented single stranded RNA genome. The genome is encircled with a nucleocapsid envelop arranged in helical symmetry. They have a diverging pleomorphic spherical outline consisting of distinct spikes ranging from 9mm to 12mm, giving the overall appearance of a solar corona. Coronavirus encodes four major structural proteins, namely; spike (S), membrane (M), envelop (E) and nucleocapsid (N)<sup>17</sup>. The other nonstructural and CCESSORY PROTEINS ARE yet to be characterized. The morphologic structure of coronavirus is depicted in Figure 2.



**Figure 1: Taxonomy and classification of coronavirus**



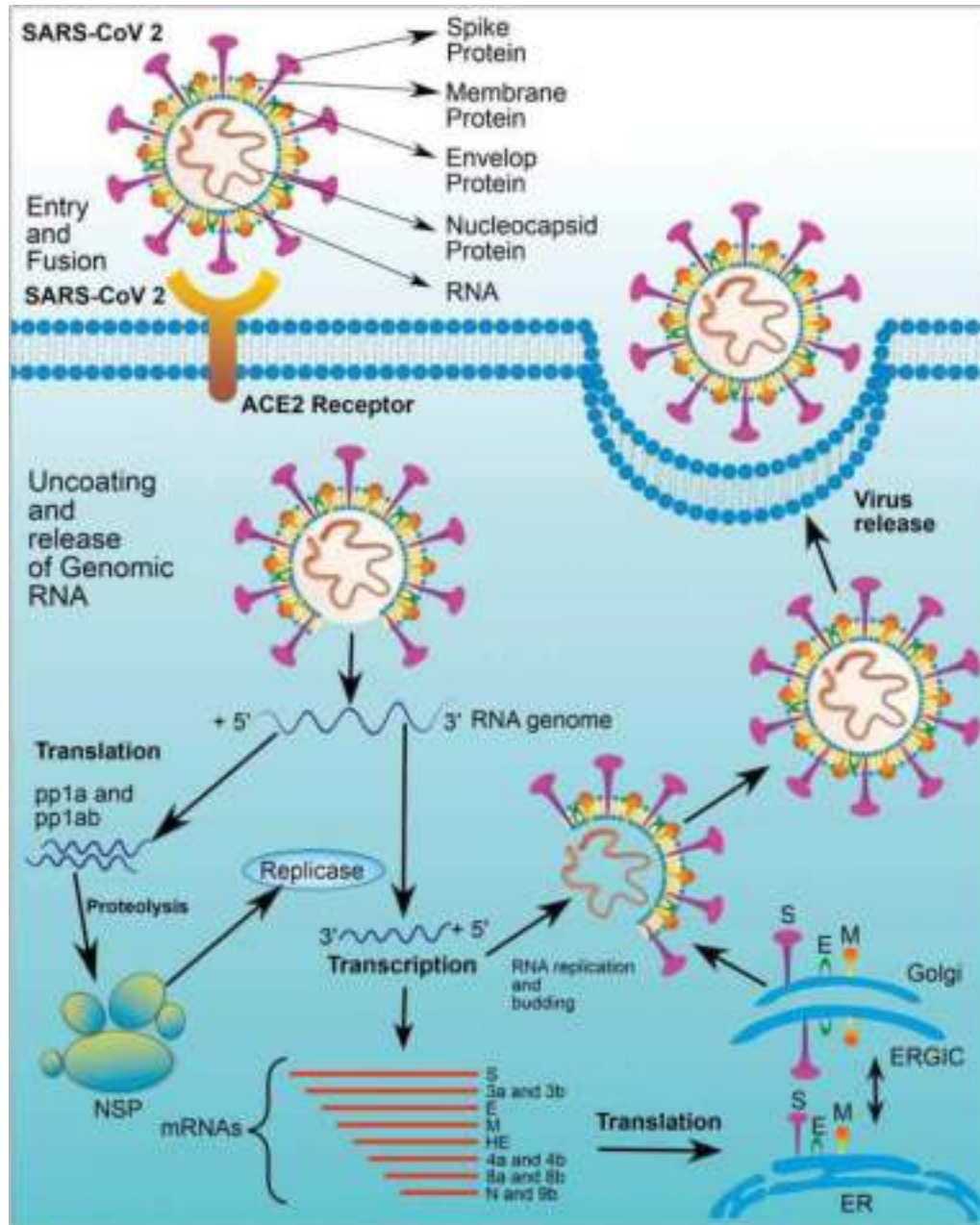
**Figure 2: Morphology of coronavirus**

### **Transmission**

COVID-19 was primarily considered a zoonotic infection as patients were exposed at the wet animal market of Wuhan city. Overtime, several reports suggested and confirmed the person-to-person transmission via direct contact or through droplets spread by either coughing or sneezing are considered main route of transmission. Further studies have ruled out vertical transmission as infants of pregnant mothers were not affected by disease<sup>18</sup>.

### **Pathogenesis of Coronavirus**

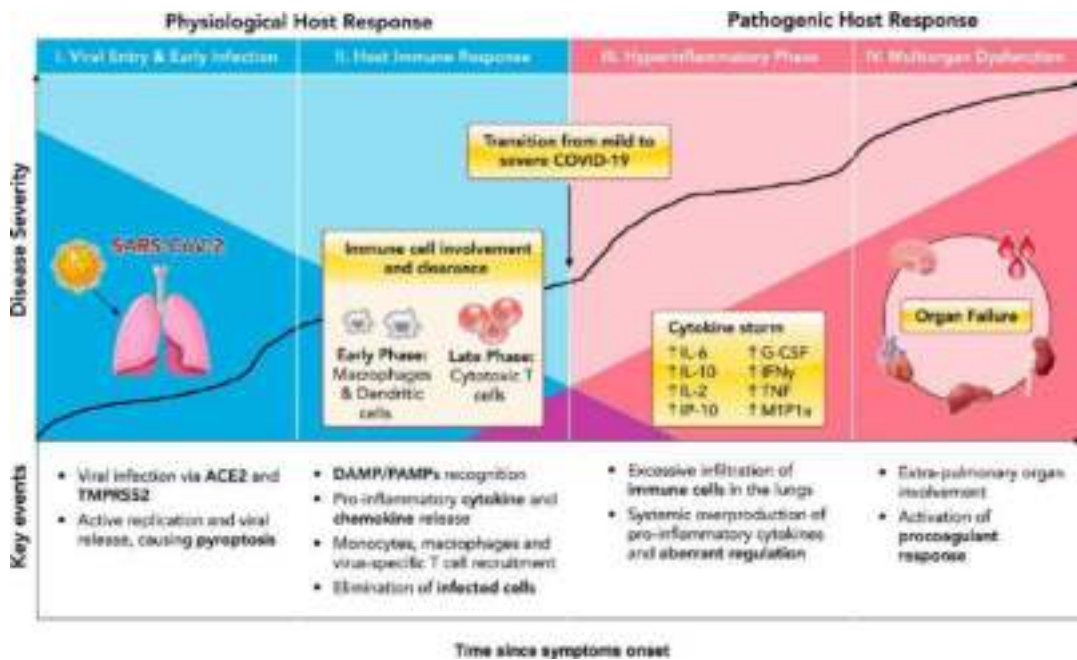
The transmitted virus binds to the receptor expressed by the host's cells followed by fusion within the cell membrane. Main mode of transmission is inhalation and hence respiratory epithelium are the primary target of the virus. Reports suggest that angiotensin converting enzyme 2 receptor is mainly involved in the infection and SARS-CoV-2 has high affinity for ACE2 receptor. Following binding with the cells, there is fusion between virus and host membrane, following which virus invades the cell<sup>19</sup>. Figure 3 briefly summarizes replication of virus.



**Figure 3: Replication of virus in host cell<sup>19</sup>**

Once the virus enters the host, a localized immune response is elicited by the body which presents as first line of physiological response against the virus. However, with increased viral replication, there is pathogenic hyperinflammatory host response

with release of pro-inflammatory cytokines<sup>20</sup>. Figure 4 depicts the pathophysiologic host response to SARS-Cov-2 virus.



**Figure 4: Pathophysiologic host response to cov-2 virus**

### **Clinical features of COVID-19 disease**

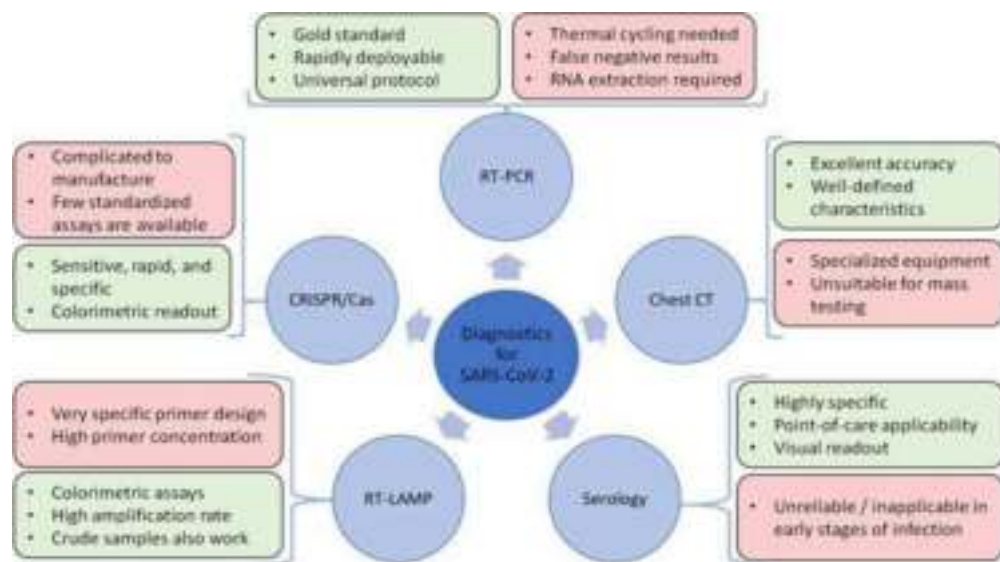
The clinical symptoms of COVID-19 are seen 5-7 days after the incubation period. During the initial phase of COVID pandemic, elderly male population was more susceptible to COVID-19 infection mainly due to the presence of comorbidities and weaker immunity. However, in the 2<sup>nd</sup> phase of COVID pandemic middle aged and children were also affected. Most of the patients will have only respiratory symptoms and non-respiratory symptoms are often rare. The initial symptoms of COVID-19 infection include, fever, cough, dyspnea, muscle pain, fatigue, excessive sputum, headache, hemoptysis and diarrhea<sup>21</sup>. Severe disease is characterized by respiratory failure, pneumonia, sepsis, multi-organ failure including cardiac and renal failure.

## Diagnosis of COVID-19

The diagnosis of COVID-19 is based on

- Viral gene detection
- Human antibody detection
- Viral antigen detection

Among these, viral gene detection by RT-PCR is most reliable and is considered the gold standard for COVID-19 diagnosis<sup>22</sup>.



**Figure 5: Approaches for COVID-19 diagnosis<sup>23</sup>**

## Criteria for COVID-19 severity based on investigations

COVID-19 infection stages are categorized as<sup>24</sup>

- Asymptomatic or pre-symptomatic infection: Patients who are tested positive for COVID-19 but are without any symptoms
- Mild illness: Patients presenting with mild symptoms of COVID-19 including fever, cough, sore throat, malaise, headache, muscle pain, nausea, vomiting, diarrhea or loss of taste and smell but not -shortness of breath, dyspnea. Patients with normal chest imaging.

- Moderate illness: Patients categorized as having with lower respiratory disease during clinical evaluation or imaging and with oxygen saturation levels of at least 94%.
- Severe illness: Patients with oxygen saturation less than 94%, respiratory rate of >30 breaths per minute, ratio of arterial partial pressure of oxygen to fraction of inspired oxygen ( $\text{PaO}_2/\text{FiO}_2$ ) <300 mm Hg or evidence of >50% lung infiltrations
- Critical illness: Patients with respiratory failure, septic shock, and/or multiple organ dysfunction.

### **Markers of COVID-19 severity**

Although initially the virus was implicated as a respiratory pathogen, several researches have indicated its pathogenicity across multiple systems including cardiovascular, gastrointestinal, neurological, hematopoietic and immunological systems. Severe and critical result in complications including septic shock, heart failure, disseminated intravascular coagulation, ischemic limbs, stroke and venous thromboembolism. Currently, along with respiratory and radiological features, evidence of changes in the laboratory parameters including hematological and biochemical parameters are found to be beneficial in grading severity of COVID-19<sup>25</sup>.

In a literature review, Marin BG et al (2021)<sup>26</sup> reported the following as predictors of COVID-19 severity. It includes:

- adults >55 years of age,
- males,
- comorbidities including hypertension, cardiovascular disease, chronic kidney disease, chronic lung disease (especially chronic obstructive pulmonary

disease), diabetes mellitus, immunosuppression, obesity, sickle cell disease and cancer

- Respiratory indicators including, SpO<sub>2</sub> <90.5%, dyspnea and low PaO<sub>2</sub>/FiO<sub>2</sub>
- CT features such as traction bronchiectasis, extensive abnormality in lung, lymph node involvement. Destruction of normal architecture and presence of “spiculations radiating from a point of focal retraction or distortion of edge of lung parenchyma”.
- Laboratory markers including elevated D-dimer ( $\geq 2 \mu\text{g/mL}$ ), elevated levels of Factor VIII, low Protein C activity, elevated levels of troponin and brain natriuretic peptides (BNP), alterations in WBC counts, elevated aspartate aminotransferase and alanine aminotransferase ,increased serum ferritin, reduced albumin-globulin ratio, elevated lactose dehydrogenase, elevated  $\alpha$ -hydroxybutyrate dehydrogenase, glycosuria, proteinuria, elevated C-reactive protein and pro-and anti-inflammatory cytokines such as interleukin-6 were found to be elevated.

### **D-dimer**

D-dimer is a degradation product of cross linked fibrin. It is a coagulation biomarker and elevated levels are associated with poor outcome in COVID-19. Elevated D-dimer levels is indicative of increased thrombin generation and fibrinolysis. Elevated D-dimer may also indicate concurrent venous thromboembolisms in the patients posing a risk of ventilation -perfusion mismatch. Additionally, respiratory infections resulting in diffuse alveolar damage and pulmonary embolism lead to increased D-Dimer levels. The cut off level of normal levels of D-dimer is  $< 2 \mu\text{g/mL}$ <sup>27</sup>.

### **LDH**

The enzyme lactose dehydrogenase is activated secondary to tissue damage and it precipitates inflammatory reaction. It is a marker of cellular injury and elevated LDH is associated with severe disease. It is suggested that LDH is a predictor of respiratory failure in COVID-19 patients. In COVID-19, in the presence of tissue damage, lactose dehydrogenase activates inflammatory response and results in hypoxia, necrosis and cell death<sup>28</sup>. A cut off value of  $\geq 82$  was reported to have a sensitivity and specificity of 81% and 93% respectively as an early predictor of disease severity<sup>29</sup>.

### **Serum ferritin**

Ferritin is an iron-storing protein, plays a primary role of regulating cellular oxygen metabolism and hence actively involved in acute phase reactions. It has both pro-inflammatory and immunosuppressive functions. Elevated levels of serum ferritin are seen during viral infections due to inflammation<sup>30</sup>. Based on the study conducted in pediatric patients, Armin S et al (2022)<sup>31</sup> suggested that the probability of an event occurring in patients with tachypnea and normal ferritin level of 140  $\mu\text{g/L}$  is 50% and its probability increases to 70% in patients with elevated ferritin levels of 500  $\mu\text{g/L}$ .

### **IL-6**

Cytokines play a crucial role in the pathophysiology of COVID-19. IL-6 is a multifunctional cytokine that regulates immune cells and is involved in cell signaling transmission. This pro-inflammatory cytokine plays an important role in inflammation, infection, and tissue damage<sup>32</sup>. Essentially, there are elevated levels of IL-6 observed in patients and this increases the risk of severity. This in turn may trigger the cytokine storms. Several studies have found that the level of IL-6 in the peripheral blood is an independent risk factor for COVID-19 severity.

### **CRP**

CRP is a non-specific acute phase protein, was first described by Tillet and Francis, is synthesized in liver in response to IL-6. Thus, is considered a biomarker of inflammation, infection and tissue damage and is marker of cardiovascular disease, acute kidney injury in surgical patients, rheumatoid arthritis, gout and venous thromboembolisms<sup>34</sup>. Although the CRP expression is generally low, during acute inflammations, the CRP levels increases substantially. Hence, elevated CRP levels with or without concomitant biomarkers is indicative of bacterial or viral infections. CRP levels of >40 mg/L is considered an independent predictor of COVID-19 severity<sup>35</sup>.

### **Related articles**

**Cooms EA, et al (2020)**<sup>36</sup> conducted a systematic review and meta-analysis to validate the relationship between elevated interleukin levels and complicated COVID-19. Systematic search for published articles investigating the immunological response in COVID-19 from MEDLINE and EMBASE databases was carried out by two authors and a total of 8 published articles (n = 1798) with complicated COVID-19 were included for the analysis. The authors reported 2.9-fold higher levels of IL-6 concentrations among patients with complicated disease as compared to patients with non-complicated disease (six studies; n = 1302; 95%CI, 1.17-7.19; sensitivity 100%). Similarly, sensitivity analysis of two studies comparing requirement of ICU showed vs no ICU admission also showed significant results (n = 540; ratio of means = 3.24; 95%CI: 2.54-4.14; P < .001; sensitivity 87%). The authors concluded that significantly elevated IL-6 levels observed in these COVID--19 patients and is associated with adverse clinical outcomes. Hence, it can be used as a predictor of severity as well as a treatment marker.

In a retrospective cohort study, **Liu F, et al (2020)**<sup>37</sup> evaluated whether IL-6, CRP and procalcitonin (PCT) can predict the severity of COVID-19 disease. A total of 140 patients diagnosed with COVID-19 between January to March 2020 were included in the study. Based on severity, patients were divided into “mild group” and “severe group” with 107 and 33, patients respectively. Demographic, baseline clinical characteristics and IL-6, CRP and Procalcitonin levels at admission were recorded. Overall, 95 (67.9%) had increased IL-6 levels, 91 (65%) had elevated CRP levels and 8(5.7%) has elevated PCT levels at baseline. Between mild and severe groups, number of patients with elevated levels were significantly higher among severe group than mild group. The authors further reported that patients with IL-6 >32.1 pg/mL or CRP >41.8 mg/L were more likely associated with severe complications and hence, can be considered independent predictors of COVID-19 severity.

**Yuan X, et al (2020)**<sup>38</sup> conducted research to determine how COVID-19 patients hematologic and immunological parameters changed. Data of 117 patients with laboratory confirmed COVID-19 disease were included in the analysis. Based on the China COVID-19 diagnostic and treatment plan, 6th edition, patients were divided into regular, severe and critically ill groups. Routine blood evaluation, along with Cellular and humoral immunity indices, biochemical and inflammatory biomarkers were assessed in these patients. Compared to regular patients, there was significant decrease in the lymphocyte count ( $p < 0.01$ ), red blood cell and hemoglobin ( $p < 0.01$ ), immunoglobulin G levels ( $p < 0.05$ ) in severe and critically ill patients. On the other hand, D-dimer ( $p < 0.0001$ ), fibrinogen ( $p < 0.01$ ), white blood cell count ( $p < 0.01$ ), neutrophil count ( $p < 0.0001$ ), interleukin-6 ( $p < 0.05$ ), C-reactive protein ( $p < 0.01$ ), procalcitonin ( $p < 0.01$ ), erythrocyte sedimentation rate ( $p < 0.05$ ), ferritin ( $p < 0.01$ ) and lactate dehydrogenase ( $p < 0.0001$ ) values were significantly greater in the severe

and critically ill patients than regular patients. The authors conferred that the above listed parameters can be considered risk factors of severe disease.

**Zeng F, et al (2020)**<sup>39</sup> conducted a meta-analysis to evaluate the association of inflammatory markers with COVID-19 severity. A total of sixteen articles with 3962 patients were included in the analysis. According to random effects model, patients in non-severe group had lower levels of CRP (WMD [95% CI]: -41.78 mg/l [-52.43, -31.13],  $P < 0.001$ ), PCT (WMD [95% CI]: -0.13 ng/ml [-0.20, -0.05],  $P < 0.001$ ), IL-6 (WMD [95% CI]: -21.32 ng/l [-28.34, -14.31],  $P < 0.001$ ), ESR (WMD [95% CI]: -8 mm/h, [-14, -2],  $P = 0.005$ ), SAA (WMD [95% CI]: -43.35  $\mu$ g/ml [-80.85, -5.85],  $P = 0.020$ ) and serum ferritin (WMD [95% CI]: -398.80 mg/l [-625.89, -171.71],  $P < 0.001$ ), compared with those in the severe group. Similarly, survivors of COVID-19 had lower levels of IL-6 than non-survivors (WMD [95% CI]: -4.80 ng/ml [-5.87, -3.73],  $P < 0.001$ ). The researchers concluded that measuring inflammatory markers might help doctors monitor and assess the severity and prognosis of COVID-19.

**Erdogan O, et al (2021)**<sup>40</sup> conducted a retrospective study to evaluate the importance of urinary biochemical parameters on the severity of COVID-19 among 133 patients diagnosed with COVID-19. Based on the severity patients were divided into moderate, severe and critical with 85, 29 and 19 patients, respectively. Additionally a total of 50 healthy patients were also evaluated as controls. In their study, there was significant increase in number of erythrocytes, proteins and glucose levels in urine of patients than controls. While the median specific gravity was significant lower than controls, the pH was significantly higher ( $p < 0.001$ , each). Additionally, the study reported positive correlations between disease severity and age, Respiratory rate (RR), proteinuria ( $p < 0.001$ , each) and negative correlation with SpO<sub>2</sub> ( $p = 0.001$ ). The authors concluded

that age, RR, SpO<sub>2</sub> and proteinuria are independent predictive factors of disease severity.

**Hariyanto TI, et al (2021)**<sup>41</sup> conducted a meta-analysis to evaluate whether the laboratory biomarkers have a potential role in risk stratification among COVID-19 patients. A total of 23 studies having 4848 patients which studies either of the laboratory variables such as serum procalcitonin, albumin, C-reactive protein (CRP), D-dimer, and lactate dehydrogenase (LDH) levels were included in the analysis. The report suggested significant increase in the procalcitonin (mean difference [95%CI]: 0.07 [0.005-0.1];  $p < 0.00001$ ), CRP (mean difference [95%CI]: 36.88 [29.10-44.65];  $p < 0.00001$ ), D-Dimer (mean difference [95%CI]: 0.43 [0.31-0.56];  $p < 0.00001$ ), and LDH (mean difference [95%CI]: 102.79 [79.10-126.49];  $p < 0.00001$ ) but lower levels of albumin (mean difference [95%CI]: -4.58 [-5.76 to -3.39];  $p < 0.00001$ ) in patients with severe COVID-19 disease as compared to NON-severe disease. The calculated cut off values for the parameters were 0.065 ng/mL for procalcitonin, 38.85 g/L for albumin, 33.55 mg/L for CRP, 0.635 /L for D-dimer, and 263.5 U/L for LDH, all of which had high sensitivity and specificity, implying that they can be used as independent predictors of disease severity.

**Lentner J, et al (2021)**<sup>42</sup> reported results of a retrospective cohort study which was conducted to evaluate the correlation between CRP levels and outcome in COVID-19 patients. Data of total of 541 adult patients diagnosed with COVID-19, with measurable CRP levels and who were discharged alive or had in-hospital mortality were extracted from medical records of 10 hospitals within Common Spirit Health. Patient outcomes and length of stay were recorded. By controlling age, comorbidities and body mass index, the baseline CRP was a significant predictor of mortality ( $p < 0.001$ ) and length of hospital stay ( $p < 0.001$ ). They also reported that with each unit increase in CRP

increased the odds of death by 0.007 and length of hospital stay by 0.003days. These results confirm the positive relationship between CRP and COVID-19 outcome.

**Lino K, et al (2021)**<sup>43</sup> carried out a study to evaluate the association between ferritin levels at admission, and hospital mortality among COVID-19 patients. Between May and July 2020, a total of 97 SARS-CoV-2 positive patients with moderate to severe clinical symptoms were included in the study. At baseline, clinical and laboratory evaluation including renal and hepatic function tests, hematological parameters and acute phase proteins were recorded. Majority were male patients (57.7%) with overall mean age of patients was 59.9±16.3 years. The study reported a significant association between Age, ferritin, C-reactive protein, serum albumin and creatinine with mortality. At a cut off value of 1873.0ng/mL serum ferritin showed AUC of 0.79 (p<0.001) with 68.4% sensitivity and 79.3% specificity in predicting in-hospital mortality suggesting serum ferritin can be used as an independent predictor of COVID-19 severity.

**Qeadan F, et al (2021)**<sup>44</sup> carried out a retrospective longitudinal study to evaluate the prognostic value of serum optimum cut off values of serum ferritin and D-dimer in patients with severe COVID-19 patients who were ventilator dependent and associated with in hospital mortality. A total of 52,411 patients diagnosed with COVID-19 were screened for the inclusion. Among them, 14,058 (28.5%) patients had valid serum ferritin and 15,005 (28.6%) patients had D-dimer laboratory results. The optimum cut off values with AUC ≥ 0.99 for in-hospital mortality and ventilator dependency was 714 ng/mL and 502 ng/mL, respectively for serum ferritin and 2.1 mg/L and 2.0 mg/L, respectively for D-dimer. Between gender comparisons revealed lower cut off values of serum ferritin and D-dimer for women compared to males for both in-hospital mortality and ventilator requirement. The authors concluded that serum ferritin and D-

dimer can be independent predictors requiring early recognition among COVID-19 patients.

**Smilowitz NR, et al (2021)<sup>45</sup> conducted a study to evaluate the association between initial CRP levels during admission and the outcome of disease among 2782 adult patients diagnosed and hospitalized with COVID-19** large New York healthcare system **from** 1 March and 8 April 2020. Outcomes of study included acute kidney injury (AKI), Venous thrombo-embolism (VTE), critical illness, and in-hospital mortality. At baseline 2601/2782 (93.5%) patients had a median (interquartile range) CRP level of 108 mg/L (53 mg/L -169 mg/L). Patients with CRP levels above the median cut off were associated with VTE (8.3% vs 3.4%; adjusted odds ratio [aOR, 95% Confidence interval]: 2.33[1.61-3.36]), AKI (43.0% vs. 28.4%; aOR [95%CI]: 2.11 [1.76-2.52]), (47.6% vs. 25.9%; aOR [95%CI]: 2.83, [2.37-3.37]), and mortality (32.2% vs. 17.8%; aOR [95%CI]: 2.59[2.11-3.18]) as compared with lower median CRP levels. The authors further reported a dose response relationship between CRP levels and adverse outcomes.

**Taj S, et al (2021)<sup>46</sup> conducted a retrospective analysis to evaluate the role of hematological parameters in determination of COVID-19 disease severity among 101 confirmed COVID-19 patients in FMH college of Medicine and Dentistry from May 2020 to July 2020. Patients were categorized into mild (20.8%), moderate (51.8%), severe (19.8%) and critical (7.9%) disease groups and hematological parameters were compared between groups. There was significant increase in the median (IQR) values of WBCs ( $p= 0.004$ ), ANC ( $p= 0.002$ ), NLR ( $p= 0.001$ ), D-dimer level ( $p= 0.001$ ), ferritin ( $p=0.0001$ ), LDH ( $p=0.0001$ ) among patients with critical disease. In the severe disease group, the median (IQR) of APTT ( $p= 0.003$ ) and CRP ( $p=$  value 0.0001) were significantly higher. The authors concluded that neutrophilia, elevated Neutrophil to**

lymphocyte ratio, Leukocytosis, D-dimer, APTT, LDH and serum ferritin and CRP are associated with increased disease severity.

Although most studies have found a link between a single biomarker and disease severity, we have attempted to demonstrate a relationship between multiple biomarkers with severity and outcome in our research. we also attempted to find cut off values for differentiating severe and non severe disease.

## **MATERIALS AND METHODS**

### **Source of Data**

Patients diagnosed with COVID-19 and admitted in KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi

### **Study design**

A cross sectional study

### **Study period**

January 2021 to December 2021

### **Sample size**

Universal sampling was taken. All patients with confirmed COVID-19 diagnosis based on RT PCR, CBNAAT, and Rapid Antigen test admitted in KLE Dr. Prabhakar Kore hospital during the study period were included in the study.

### **Selection criteria**

#### **Inclusion criteria**

- All patients above 18 yrs having a confirmed COVID-19 diagnosis based on RT PCR, CBNAAT, and Rapid Antigen test.

#### **Exclusion criteria**

- Pregnant women
- Children <18 years
- Patients with incomplete medical records of biomarkers.
- Patients without conformed microbiological diagnosis.

**Methodology**

A detailed history of patients with RT PCR, CBNAAT, and Rapid Antigen test diagnosed COVID-19 were recorded. Details on demographics, symptoms, comorbidities, oxygenation parameters, vitals, laboratory biomarker levels were recorded at the time of admission. COVID-19 Patients were categorized into three groups based on ICMR clinical severity guidelines depending on the saturation (spo2), respiratory rate, oxygen requirement. For patients with mild disease, there was no hypoxia (spo2>94%), respiratory rate must be <24 and no requirement of o2 whereas for patients with moderate disease there must be hypoxia spO2<94, requirement of O2 but no mechanical ventilation, respiratory rate >24 whereas for patients with severe disease there must be severe hypoxia (spo2<90%),RR>30 requirement of HFNC, non-invasive(CPAP),invasive ventilation.

Table 1: Clinical severity and assessment parameters

Clinical Severity	Clinical presentation	Clinical parameters	Remarks
<b>Mild<sup>2</sup></b>	Patients with uncomplicated upper respiratory tract infection, may have mild symptoms such as fever, cough, sore throat, nasal congestion, malaise, headache	Without shortness of breath or Hypoxia (normal saturation).	(i) Managed at Covid Care Centre OR at home (as per home isolation guidelines) <sup>2</sup>
<b>Moderate</b>	Pneumonia with no signs of severe disease	Adults with presence of clinical features of dyspnea and or hypoxia, fever, cough, including SpO <sub>2</sub> 90 to ≤93% on room air, Respiratory Rate more or equal to 24 per minute.	Managed in Dedicated Covid Health Centre (DCHC)
<b>Severe</b>	Severe Pneumonia	Adults with clinical signs of Pneumonia plus one of the following: respiratory rate >30 breaths/min, severe respiratory distress, SpO <sub>2</sub> <90% on room air.	Managed in Dedicated Covid Hospital (DCH)

Disease progression was also monitored during the course hospital stay. Outcome of the patient was recorded in the form of survival or death. Comparison of disease severity with demographics, symptoms, comorbidities was assessed. Correlation of disease severity with admission laboratory markers HsCRP, LDH, IL6, Ddimer, Ferritin was determined. Correlation between laboratory markers and clinical outcome in the form of survival or mortality was estimated. Optimum cut off values for individual biomarkers which will predict whether disease is severe or non-severe (mild, moderate) was calculated. Sensitivity, specificity, positive predictive value, negative predictive value, AU-ROC, odds ratio were calculated.

### **Data collection**

The following data were collected using a case history proforma specific to the study.

- Patient demographics including age and gender
- Nature of presentation; symptomatic or asymptomatic
- COVID 19 symptoms at the time of admission including, cough, breathlessness, fever, myalgia, loss of smell. Loss of taste
- Comorbidities at the time of admission
- Respiratory parameters
- Laboratory biomarker levels such as serum Ferritin, LDH, HsCRP, IL-6 and d-Dimer
- Outcome of disease: death or survival

### **Ethical considerations**

Institutional ethical clearance was obtained prior to initiation of the study. The details of the study were explained to the patients and an informed consent was obtained from all patients

### **Data handling**

The collected data were entered in Microsoft excel and the related records were stored safely with no access to other study personnel.

### **Statistical analysis**

Data was analysed using statistical software R version 4.1.2 and Excel. Categorical variables were summarized as frequency and percentages. Continuous variables were presented as Mean and standard deviation or median (minimum, maximum) values. Chi-square test was used to check the dependency between categorical variables. Kruskal Wallis test was used to compare the distributions of variables over severity. Dunn's test was used as post hoc analysis. Applicability of different parameters to predict severity was checked by Logistic regression and Receiver Operating Characteristic (ROC) curves. Cut off values were obtained by simultaneously maximizing sensitivity and specificity. P-value less than or equal to 0.05 indicates statistical significance.

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## RESULTS

A total of 532 patients diagnosed with COVID-19 were included in our study. Patients belonged to the age group of 18 to 93 years having a median age of 55 years and mean  $\pm$  standard deviation (SD) age of  $53.09 \pm 17.13$  years. Descriptive statistics of age are described in table 1.

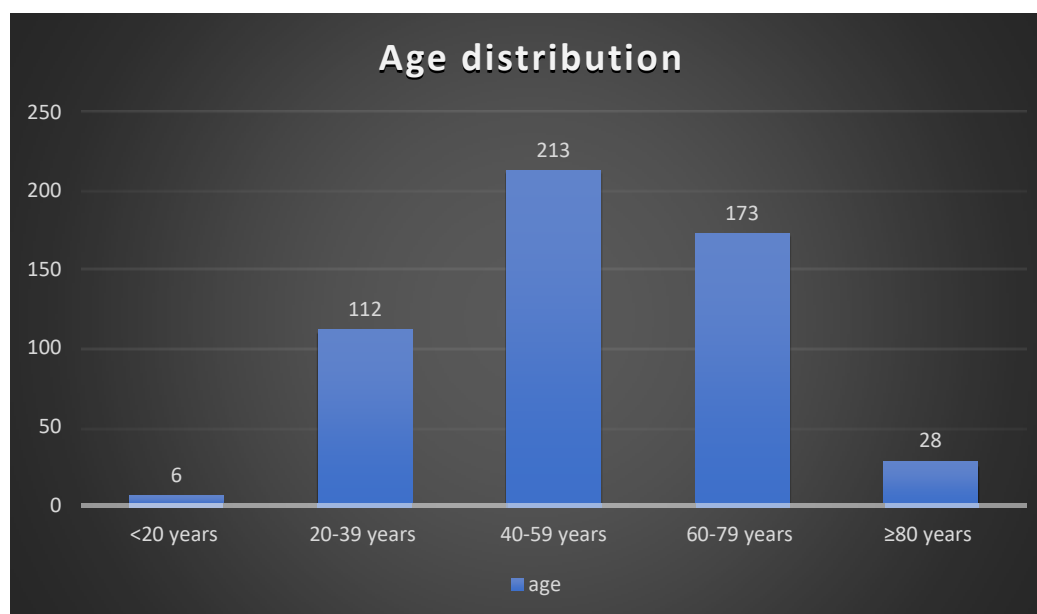
**Table 1: Descriptive statistics of age in the study population**

<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Median</b>	<b>Minimum</b>	<b>Maximum</b>
<b>Age, years</b>	532	53.09	17.13	55	18	93

Age distribution of study population is shown in Table 2, Graph 1. Majority of patients (n=213, 40.04%) belonged to the age group of 40-59 years followed by 60-79 years (n=173, 32.52%) and 20-39 years (n=112, 21.05%).

**Table 2: Age distribution of study population**

<b>Variable</b>	<b>Groups</b>	<b>Frequency N=532</b>	<b>Percentage %</b>
<b>Age groups</b>	<b>&lt;20 years</b>	6	1.13
	<b>20-39 years</b>	112	21.05
	<b>40-59 years</b>	213	40.04
	<b>60-79 years</b>	173	32.52
	<b>≥80 years</b>	28	5.26
<b>Total</b>		<b>532</b>	<b>100</b>

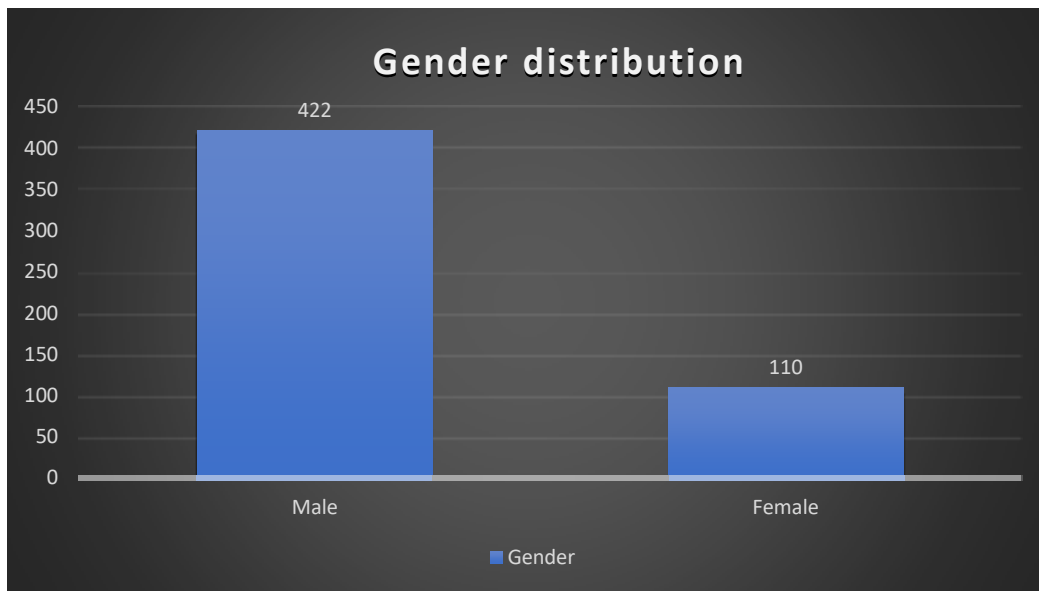


**Graph 1: Frequency distribution of age in the study population**

In our study, majority of the study population comprised of males (n=422, 79.32%), followed by females (n=110, 20.68%). Male to female ratio was 3.:1. Gender distribution is summarized in Table 3 and graph 2

**Table 3: Gender distribution of study population**

Variable		Frequency N=532	Percentage %
Gender	Male	422	79.32
	Female	110	20.68
Total		532	100

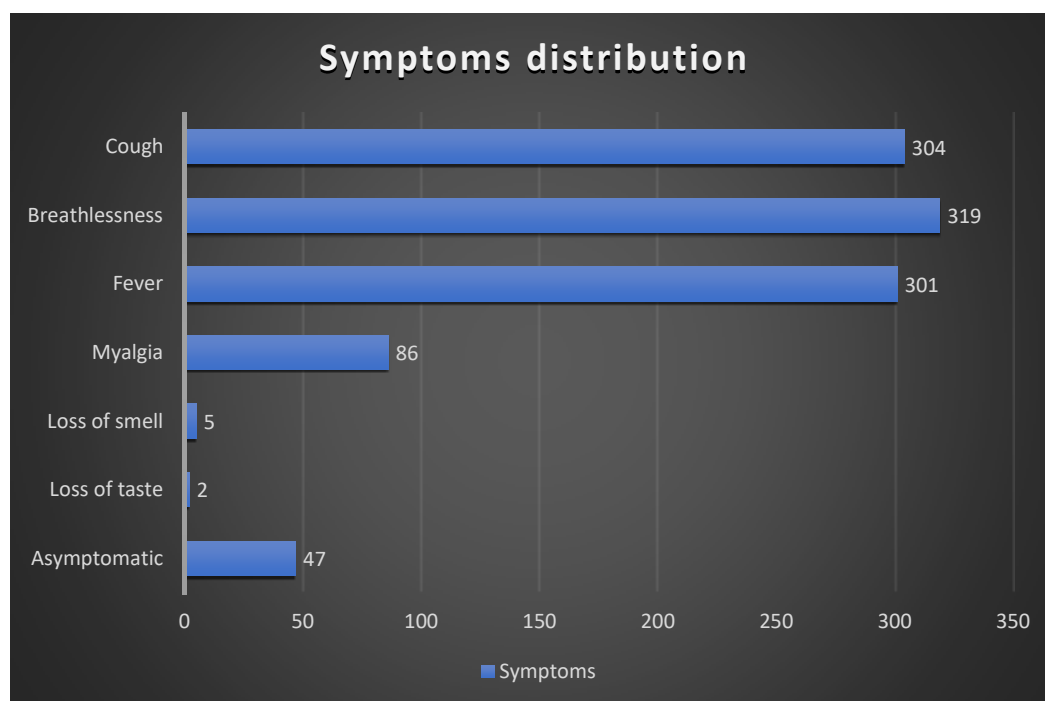


**Graph 2: Frequency distribution of gender in the study population**

In our study, 47(8.83%) patients were found asymptomatic. Most common symptoms were cough (n=304, 57.41%), fever (n=319, 56.58%) and breathlessness (n=301, 59.96%; Table 4, Graph 3).

**Table 4: Symptom distribution in the study population**

Variable	Groups	Frequency N=532	Percentage %
Symptoms	Cough	304	57.14
	Breathlessness	319	59.96
	Fever	301	56.58
	Myalgia	86	16.17
	Loss of smell	5	0.94
	Loss of taste	2	0.38
	Asymptomatic	47	8.83
<b>Total</b>		<b>532</b>	<b>100</b>

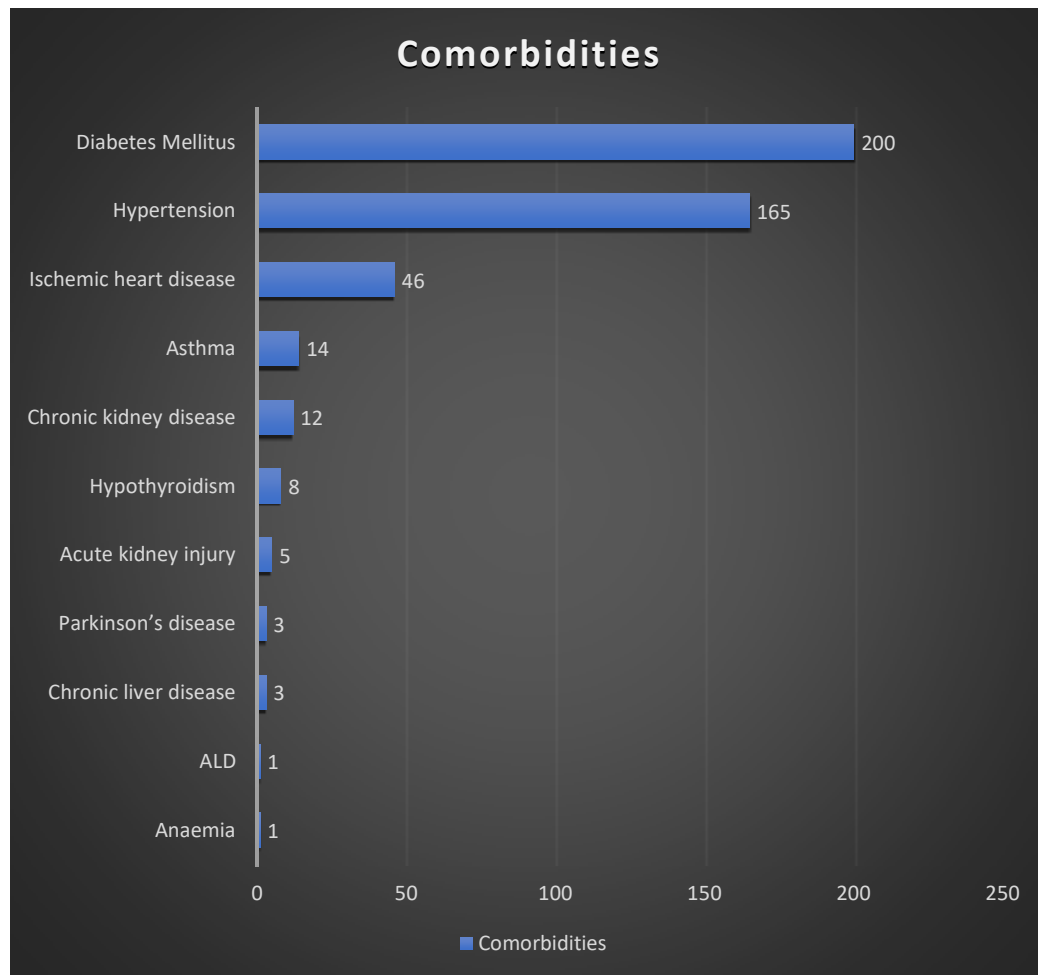


**Graph 3: Frequency distribution of symptoms in the study population**

Diabetes Mellitus (n=200, 37.59%) was the most commonly reported comorbidity in our study population, followed by hypertension (n=165, 31.02%), ischemic heart disease (n=46, 8.65%), asthma (n=14, 2.63%), chronic kidney disease (n=12, 2.26%). Table 5 and Graph 4 summarize the distribution of comorbidities in the study population.

**Table 5: Comorbidities distribution in the study population**

<b>Variable</b>	<b>Groups</b>	<b>Frequency</b> N=532	<b>Percentage</b> %
<b>Comorbidity</b>	<b>Diabetes Mellitus</b>	200	37.59
	<b>Hypertension</b>	165	31.02
	<b>Ischemic heart disease</b>	46	8.65
	<b>Asthma</b>	14	2.63
	<b>Chronic kidney disease</b>	12	2.26
	<b>Hypothyroidism</b>	8	1.5
	<b>Acute kidney injury</b>	5	0.94
	<b>Parkinson's disease</b>	3	0.56
	<b>Chronic liver disease</b>	3	0.56
	<b>ALD</b>	1	0.19
	<b>Anaemia</b>	1	0.19
	<b>Total</b>		<b>532</b>

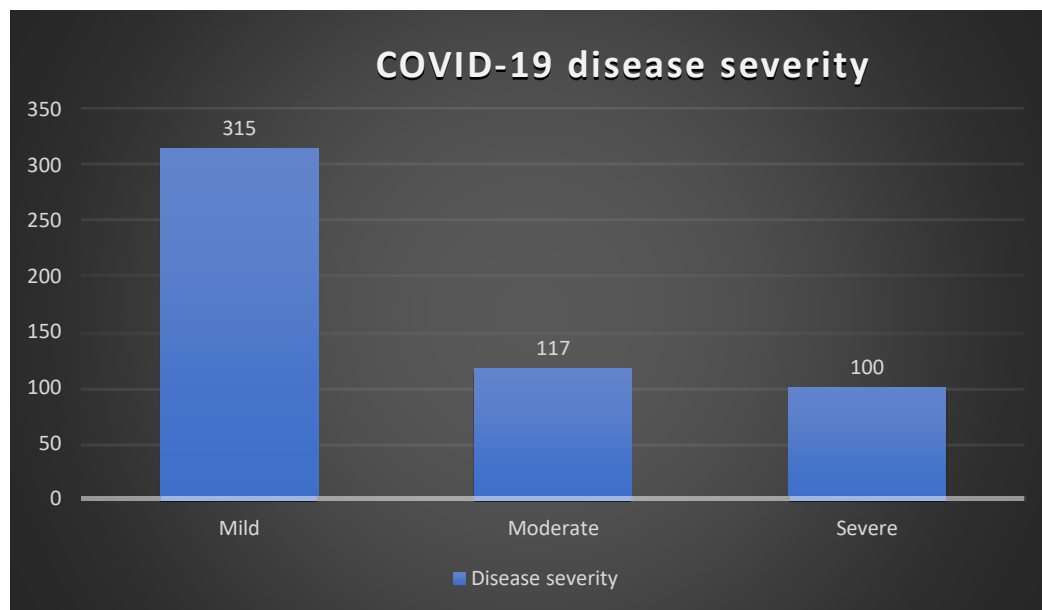


**Graph 4: Frequency distribution of comorbidities in the study population**

Table 6 and Graph 5 summarize the distribution of patients based on COVID-19 disease severity in the study population. At the time of admission, 100(18.80%) of the 532 patients studied had severe disease, while the 315(59.21%) had mild and 117(21.9%) had moderate disease.

**Table 6: Distribution of patients based on COVID-19 disease severity**

Variable		Frequency N=532	Percentage %
Disease Severity	Mild	315	59.21
	Moderate	117	21.99
	Severe	100	18.8
Total		532	100



**Graph 5: Frequency distribution of COVID-19 disease severity in the study population**

Descriptive statistics of the laboratory findings of COVID-19 in our study population is summarized in Table 7. Mean  $\pm$  SD SPO<sub>2</sub> of the patients at the time of admission was recorded to be  $91.91 \pm 9.75$  %. Overall mean values of Ferritin, LDH, HsCRP, IL-6 and d-Dimer of study population were found to be elevated. The Mean  $\pm$  SD value of Ferritin, LDH, HsCRP, IL-6 and D-dimer was  $551.75 \pm 684.52$  ng/mL,  $431.1 \pm 288.81$  U/L,  $99.13 \pm 108.52$  mg/L,  $108.67 \pm 300.36$  pg/mL, and  $934.59 \pm 1269.92$  ng/mL, respectively.

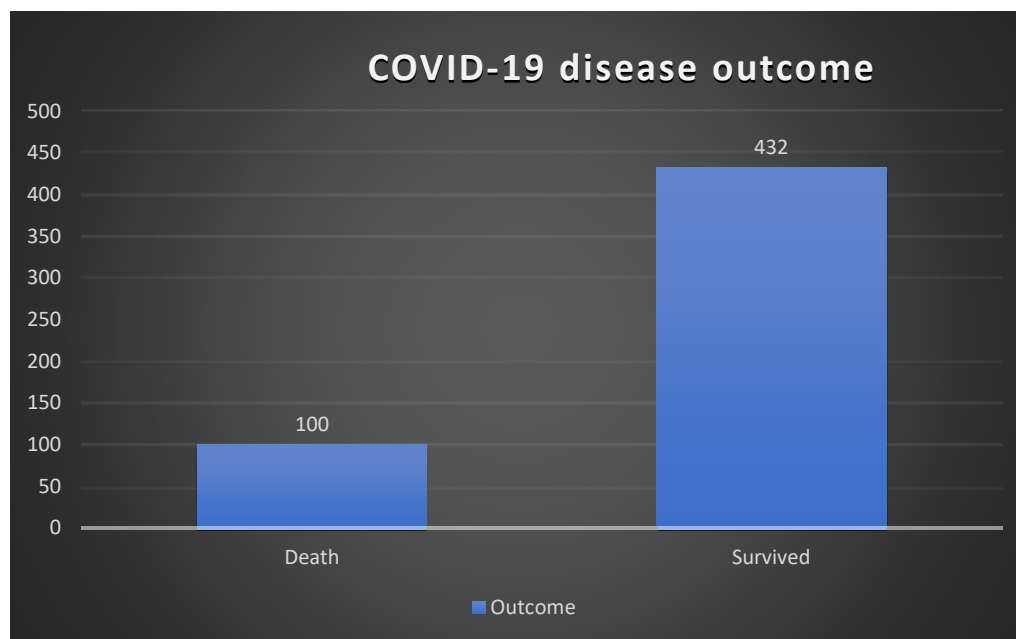
**Table 7: Descriptive statistics of laboratory investigations**

<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Median</b>	<b>Minimum</b>	<b>Maximum</b>
<b>Ferritin, ng/mL</b>	532	551.75	684.52	322.85	4.7	4624
<b>LDH, U/L</b>	532	431.1	288.81	358	5.07	3650
<b>HsCRP, mg/L</b>	532	99.13	108.52	73.15	0.4	772
<b>IL-6, pg/mL</b>	532	108.67	300.36	32.1	1.15	4754
<b>d-Dimer (ng/mL)</b>	532	934.59	1269.92	499	6.64	7500

Table 8 and Graph 6 summarizes the frequency distribution of COVID-19 disease outcome among patients in our study cohort. Among 532 patients admitted, 100 (18.8%) patients succumbed to COVID-19 and 432 (81.2%) were alive.

**Table 8: Distribution of patients based on COVID-19 disease outcome**

Variable		Frequency N=532	Percentage %
Gender	Death	100	18.8
	Survived	432	81.2
<b>Total</b>		<b>532</b>	<b>100</b>



**Graph 6: Frequency distribution of COVID-19 disease outcome in the study population**

Correlation of age and severity of disease was analysed using Kruskal Wallis test and is shown in Table 9. Significant difference in the mean  $\pm$  SD age between mild, moderate and severe disease ( $48.68 \pm 17.69$  years vs.  $55.89 \pm 13.48$  years vs.  $63.74 \pm 13.48$  years;  $p < 0.001$ ).

**Table 9: Comparison of mean age between disease severities**

	Severity			p-value
	Mild	Moderate	Severe	
<b>Age, years</b>	$48.68 \pm 17.69$	$55.89 \pm 13.48$	$63.74 \pm 13.48$	<b><math>&lt; 0.001^{K*}</math></b>

*K – Kruskal Wallis test, \* indicates statistical significance.*

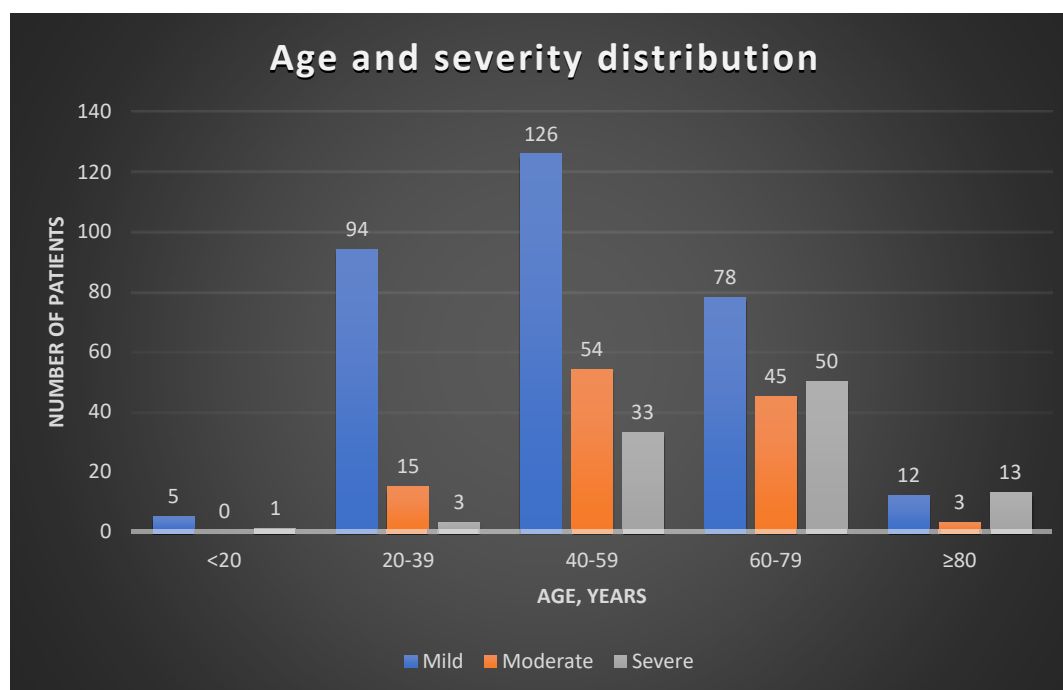
Association of age with disease severity is summarized in Table 10 and Graph 7.

Elderly people are more prone for severe disease compared to young people of disease and 50% of patients in severe group belonged to age group of 60-79 years when compared to mild (24.76%) and moderate (38.46%). The difference was statistically significant ( $< 0.001$ ).

**Table 10: Association of age with disease severity**

Variables	Sub Category	Severity			p-value
		Mild	Moderate	Severe	
Age, years	<20	5 (1.59%)	0	1 (1%)	<b>&lt; 0.001<sup>MC*</sup></b>
	20-39	94 (29.84%)	15 (12.82%)	3 (3%)	
	40-59	126 (40%)	54 (46.15%)	33 (33%)	
	60-79	78 (24.76%)	45 (38.46%)	50 (50%)	
	≥80	12 (3.81%)	3 (2.56%)	13 (13%)	

*MC- Chi square test with Monte Carlo simulation, \* indicates statistical significance.*



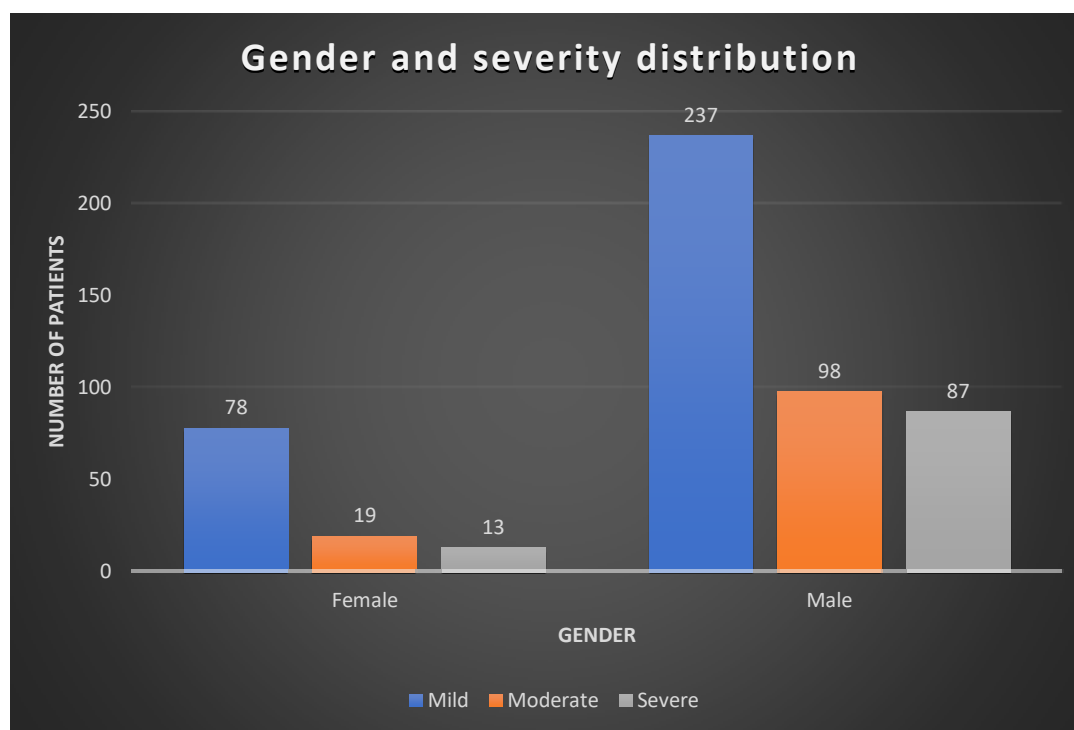
**Graph 7: Comparison of COVID-19 disease severity among different age groups**

Distribution of gender based on disease severity is summarized in Table 11 and Graph 8. Among females patients 78 patients had mild disease, 19 patients had moderate disease and 13 patients had severe disease. Among males, 237 patients had mild disease, 98 patients had moderate disease and 87 patients had severe disease. The difference was statistically significant (p=0.0166).

**Table 11: Effect of gender with disease severity**

Variables	Sub Category	Severity			p-value
		Mild	Moderate	Severe	
Gender	Female	78 (24.76%)	19 (16.24%)	13 (13%)	<b>0.0166<sup>C*</sup></b>
	Male	237 (75.24%)	98 (83.76%)	87 (87%)	

*C- Chi square test, \* indicates statistical significance*



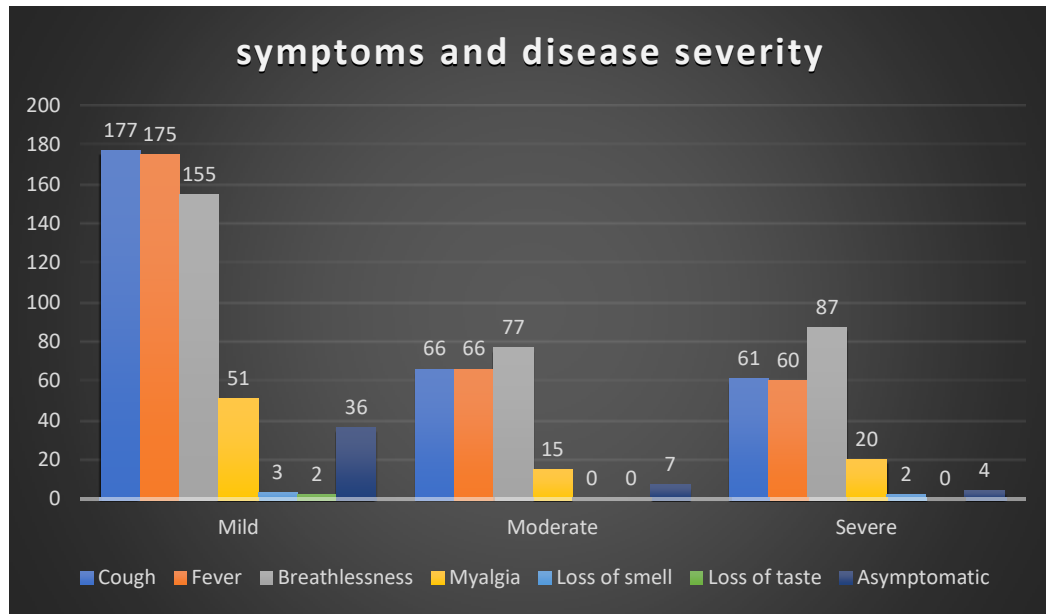
**Graph 8: Association of gender on COVID-19 disease severity**

Association of different symptoms of COVID-19 and disease severity is summarized in Table 12 and Graph 9. Breathlessness was most common symptom occurred in 155 patients with mild disease, 77 patients with moderate disease and 87 patients with severe disease. The difference was statistically significant ( $p < 0.001$ ). Similarly, most patients with mild disease were asymptomatic ( $n=36$ ), compared to patients with moderate ( $n=7$ ) and severe disease ( $n=4$ ). The difference was statistically significant ( $p=0.0348$ ). No significant difference in the incidence of cough ( $p=0.6874$ ), fever ( $p=0.7364$ ), myalgia ( $p=0.3586$ ), loss of smell ( $p=0.2919$ ), loss of taste ( $p=0.7326$ ), was observed between mild moderate and severe COVID-19 disease.

**Table 12: Comparison of symptoms among different disease severities in the study population**

Variables	Sub Category	Severity			p-value
		Mild	Moderate	Severe	
Symptoms	Cough	177 (56.19%)	66 (56.41%)	61 (61%)	0.6874 <sup>C</sup>
	Fever	175 (55.56%)	66 (56.41%)	60 (60%)	0.7364 <sup>C</sup>
	Breathlessness	155 (49.21%)	77 (65.81%)	87 (87%)	<b>&lt; 0.001</b> <sup>C*</sup>
	Myalgia	51 (16.19%)	15 (12.82%)	20 (20%)	0.3586 <sup>C</sup>
	Loss of smell	3 (0.95%)	0	2 (2%)	0.2919 <sup>MC</sup>
	Loss of taste	2 (0.63%)	0	0	0.7326 <sup>MC</sup>
	Asymptomatic	36 (11.43%)	7 (5.98%)	4 (4%)	<b>0.0348</b> <sup>C*</sup>

*MC- Chi square test with Monte Carlo simulation, C- Chi square test, \* indicates statistical significance*



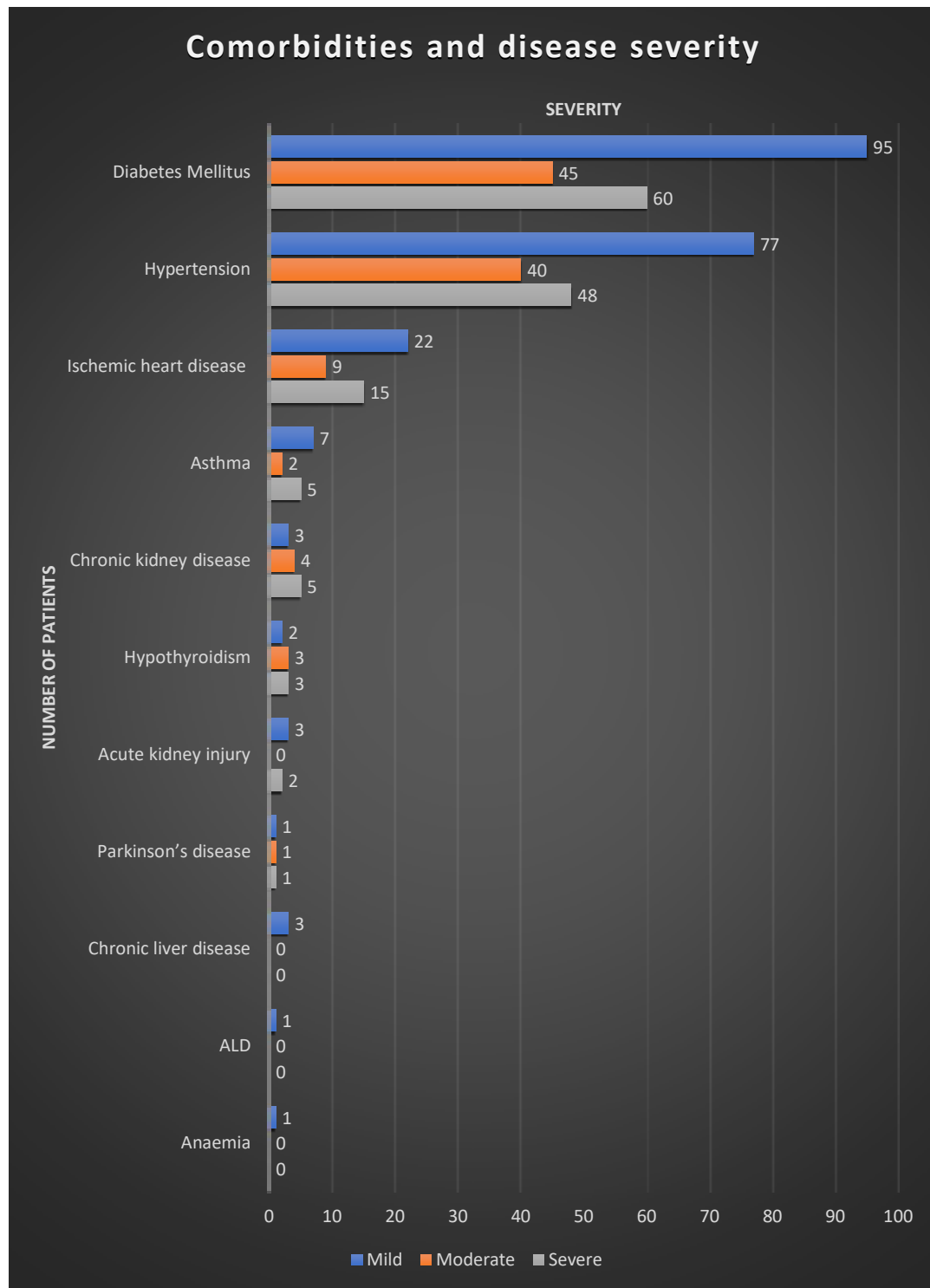
**Graph 9: Association of symptoms with COVID-19 disease severity**

Among 200 patients with Diabetes mellitus, 95 patients had mild disease, 45 patients had moderate disease and 60 patients had severe disease ( $p < 0.001$ ). Among 165 patients with hypertension, 77, 40, and 48 patients had mild, moderate and severe disease, respectively ( $p < 0.001$ ). Similarly, patients with ischemic heart disease ( $p = 0.0419$ ) and chronic kidney disease ( $p = 0.033$ ) had severe COVID-19 disease. No significant association between other comorbidities such as asthma ( $p = 0.2634$ ), hypothyroidism ( $p = 0.1224$ ), acute kidney injury ( $p = 0.2919$ ), Parkinson’s disease ( $p = 0.7606$ ), chronic liver disease ( $p = 0.7606$ ) with COVID-19 disease severity (Table 13 and Graph 10).

**Table 13: Association of comorbidities with COVID-19 disease severity**

Variables	Sub Category	Severity			p-value
		Mild	Moderate	Severe	
Comorbidity	Diabetes Mellitus	95 (30.16%)	45 (38.46%)	60 (60%)	<b>&lt; 0.001<sup>C*</sup></b>
	Hypertension	77 (24.44%)	40 (34.19%)	48 (48%)	<b>&lt; 0.001<sup>C*</sup></b>
	Ischemic heart disease	22 (6.98%)	9 (7.69%)	15 (15%)	<b>0.0419<sup>C*</sup></b>
	Asthma	7 (2.22%)	2 (1.71%)	5 (5%)	0.2634 <sup>MC</sup>
	Chronic kidney disease	3 (0.95%)	4 (3.42%)	5 (5%)	<b>0.033<sup>MC*</sup></b>
	Hypothyroidism	2 (0.63%)	3 (2.56%)	3 (3%)	0.1224 <sup>MC</sup>
	Acute kidney injury	3 (0.95%)	0	2 (2%)	0.2919 <sup>MC</sup>
	Parkinson’s disease	1 (0.32%)	1 (0.85%)	1 (1%)	0.7606 <sup>MC</sup>
	Chronic liver disease	3 (0.95%)	0	0	0.4263 <sup>MC</sup>
	ALD	1 (0.32%)	0	0	1 <sup>MC</sup>
	Anaemia	1 (0.32%)	0	0	1 <sup>MC</sup>

*MC- Chi square test with Monte Carlo simulation, C- Chi square test, \* indicates statistical significance*



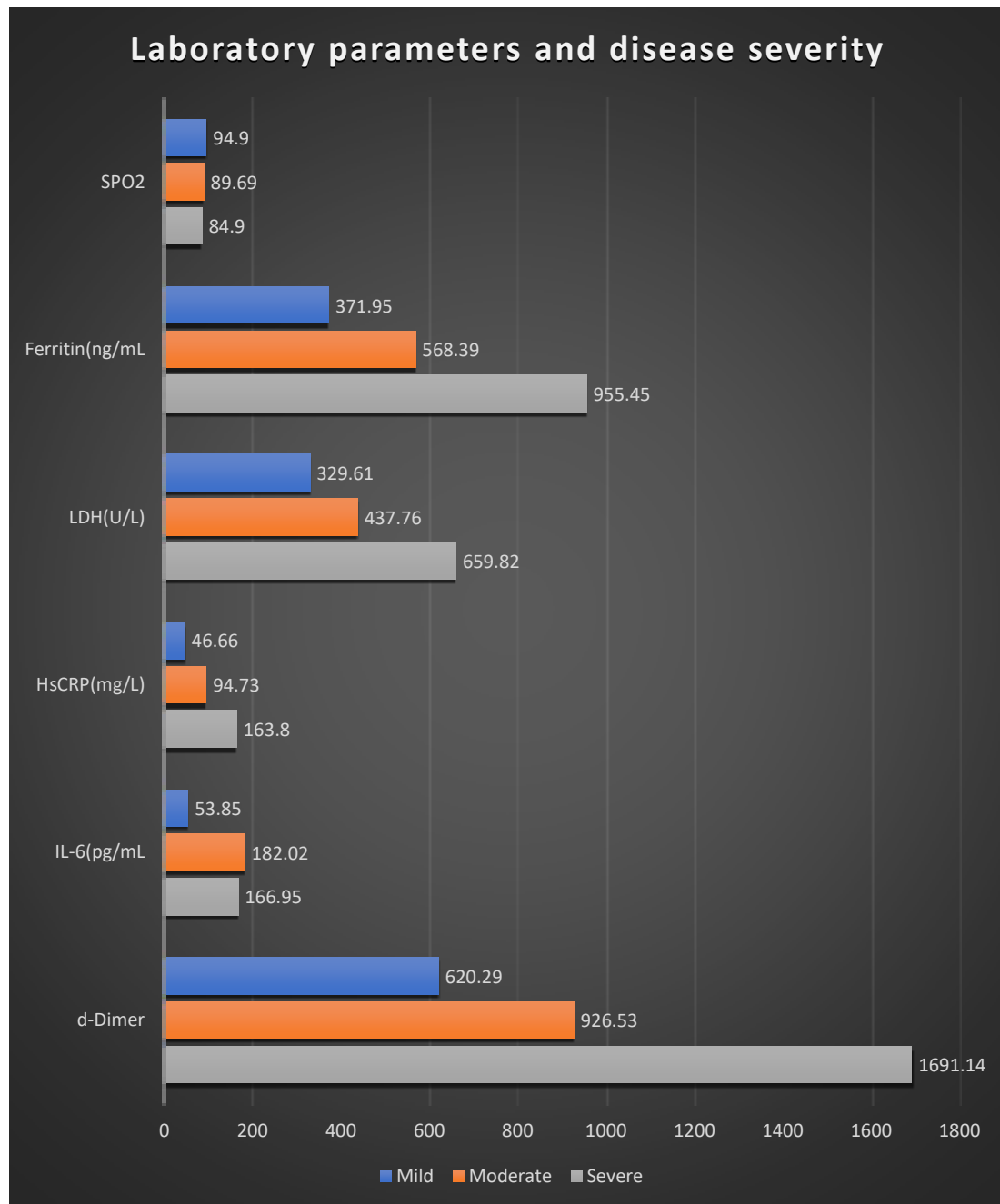
**Graph 10: Distribution of patients based on different comorbidities and associated disease severity**

Correlation between laboratory indices of COVID-19 disease and disease severity are summarized in Table 14 and Graph 11. Significant increase in the Mean  $\pm$  SD values of Ferritin ( $955.45 \pm 856.16$ ng/mL vs  $371.95 \pm 535.96$  ng/mL vs  $568.39 \pm 630.85$  ng/mL;  $p < 0.001$ ), LDH ( $659.82 \pm 409.11$ U/L vs  $329.61 \pm 152.05$ U/L vs  $437.76 \pm 250.13$ U/L;  $p < 0.001$ ), HsCRP ( $163.8 \pm 128.8$ mg/L vs  $46.66 \pm 59.66$ mg/L vs  $94.73 \pm 84.74$ mg/L;  $p < 0.001$ ), IL-6 ( $166.95 \pm 226.87$  pg/mL vs  $53.85 \pm 98.13$ pg/mL vs  $182.02 \pm 565.7$ pg/mL;  $p < 0.001$ ) and d-DIMER ( $1691.14 \pm 1746.6$  vs  $620.29 \pm 901.5$  vs  $926.53 \pm 1131.06$  ;  $p < 0.001$ ) values were observed in patients with severe disease than those with mild and moderate disease.

**Table 14: Correlation between laboratory indices and COVID-19 disease severity**

Variables	Severity			p-value
	Mild	Moderate	Severe	
Ferritin(ng/mL)	$371.95 \pm 535.96$	$568.39 \pm 630.85$	$955.45 \pm 856.16$	<b>&lt; 0.001<sup>K*</sup></b>
LDH(U/L)	$329.61 \pm 152.05$	$437.76 \pm 250.13$	$659.82 \pm 409.11$	<b>&lt; 0.001<sup>K*</sup></b>
HsCRP(mg/L)	$46.66 \pm 59.66$	$94.73 \pm 84.74$	$163.8 \pm 128.8$	<b>&lt; 0.001<sup>K*</sup></b>
IL-6(pg/mL)	$53.85 \pm 98.13$	$182.02 \pm 565.7$	$166.95 \pm 226.87$	<b>&lt; 0.001<sup>K*</sup></b>
d-Dimer	$620.29 \pm 901.5$	$926.53 \pm 1131.06$	$1691.14 \pm 1746.6$	<b>&lt; 0.001<sup>K*</sup></b>

*K – Kruskal Wallis test, \* indicates statistical significance.*



**Graph 11: Comparison of mean laboratory indices with COVID-19 disease severity**

Table 15 summarizes correlation of individual markers with severity and mortality cut off value for correlation was taken as 25%. Out of them (LDH, HsCRP, IL6, D dimer ) had positive correlation with mortality, severe disease and negative correlation with survival and mild disease. Of them HsCRP and LDH had highest correlation of 45% and 42% respectively. IL6 had 25 % correlation and D dimer had 30%.

**Table 15: correlation table of disease severity and survival**

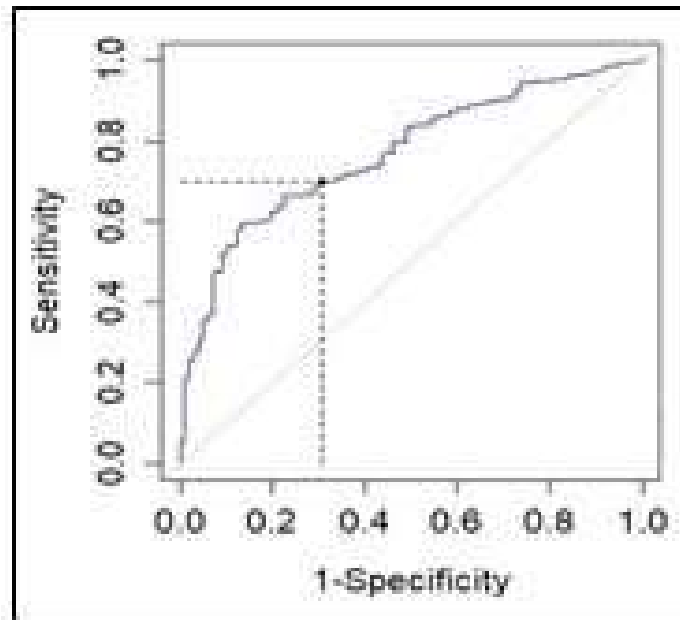
Survived	LDH	-42%	Negative Correlation
Survived	hsCRP	-45%	Negative Correlation
Death	LDH	42%	Positive Correlation
Death	hsCRP	45%	Positive Correlation
Mild	LDH	-28%	Negative Correlation
Mild	hsCRP	-31%	Negative Correlation
Severe	LDH	28%	Positive Correlation
Severe	hsCRP	26%	Positive Correlation
Survived	IL-6	-25%	Negative Correlation
Death	IL-6	25%	Positive Correlation
Survived	d-dimer	-30%	Negative Correlation

Table 16 summarizes the estimated optimum cut off values of ferritin, Sensitivity (95% CI), Specificity (95% CI), PPV (95% CI), NPV (95% CI), AU-ROC (95% CI), Odds Ratio (95% CI) and p value. The estimated optimum cut off that would predict disease severity for ferritin was >437.1 ng/mL with specificity, sensitivity and AUC accordingly found to be 69.63% (64.32 -74.58%), 69.39% (59.26% - 78.30%) and 0.767 (0.718, 0.816). From univariate logistic regression, the odds ratio (95% CI) for Ferritin was 1.001 (1.0007, 1.0014; p< 0.001). Graph 12 shows the AU-ROC of ferritin.

**Table 16: Optimal cut-off and accuracy indices of Ferritin in predicting severity**

Statistics	Value	95% Confidence interval	
		Lower limit of 5% CI	Upper limit
<b>Cut-off</b>	(>) 437.1	-	-
<b>Sensitivity, %</b>	69.63	64.32	74.58
<b>Specificity, %</b>	69.39	59.26	78.30
<b>PPV, %</b>	88.33	82.93	90.64
<b>NPV, %</b>	40.72	35.07	52.23
<b>AU-ROC</b>	0.767	0.718	0.816
<b>Odds Ratio</b>	1.001	1.0007	1.0014
<b>p-value</b>	<b>&lt; 0.001*</b>		

\* indicates statistical significance.



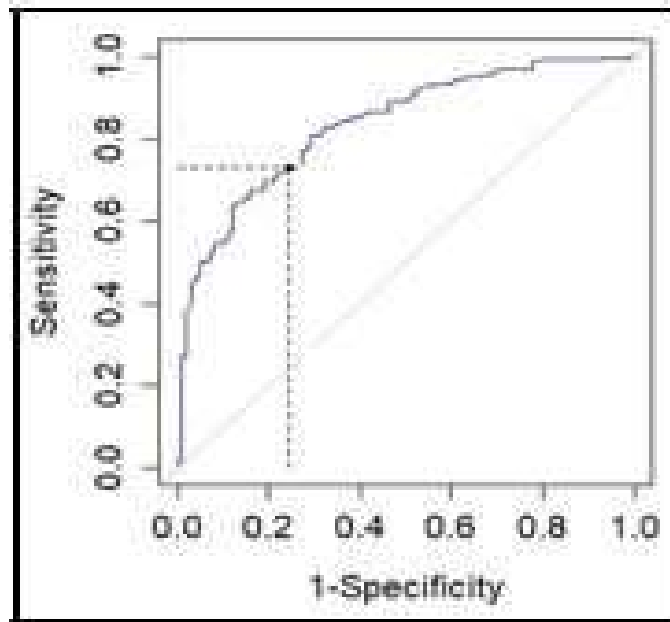
**Graph 12: ROC curve for ferritin in predicting severity of COVID-19**

For LDH, the predicted cut off value was >415U/L along with specificity, sensitivity and AUC of 73.04% (95% CI: 67.81% - 77.83%), 75.76% (95% CI: 66.11% - 83.81%) and 0.834(95% CI: 0.791, 0.877) respectively. From univariate logistic regression, the odds ratio (95% CI) for LDH was 1.0055 (1.0042, 1.0069; p< 0.001, Table 16), Graph 13 shows the AU-ROC of LDH.

**Table 17: Optimal cut-off and accuracy indices of LDH in predicting severity**

Statistics	Value	95% Confidence interval	
		Lower limit of 5% CI	Upper limit
<b>Cut-off</b>	(>) 415	-	-
<b>Sensitivity, %</b>	73.04	67.81	77.83
<b>Specificity, %</b>	75.76	66.11	83.81
<b>PPV, %</b>	90.66	85.84	92.64
<b>NPV, %</b>	46.58	40.41	59.09
<b>AU-ROC</b>	0.834	0.791	0.877
<b>Odds Ratio</b>	1.0055	1.0042	1.0069
<b>p-value</b>	<b>&lt; 0.001*</b>		

\* indicates statistical significance.



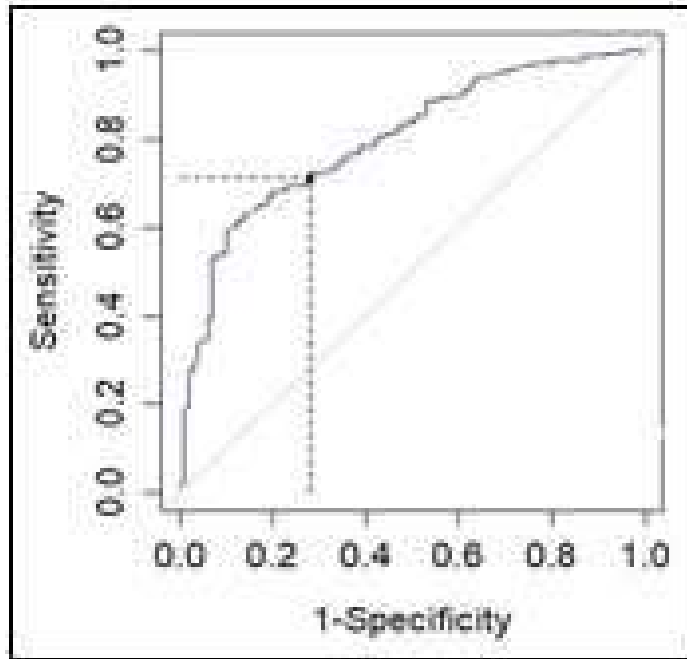
**Graph 13: ROC curve for LDH in predicting severity of COVID-19**

A level of >85.6 mg/L HsCRP had better predicted the disease severity with corresponding specificity, sensitivity and AUC of 71.18% (95% CI: 63.74% - 77.85%), 72% (95% CI: 62.13% - 80.52%) and 0.798 (95% CI: 0.745, 0.852). From univariate logistic regression, the odds ratio (95% CI) for HsCRP was 1.0126(1.0091, 1.0165);  $p < 0.001$ , Table 17), Graph 14 shows the AU-ROC of HsCRP.

**Table 18: Optimal cut-off and accuracy indices of HsCRP in predicting severity**

Statistics	Value	95% Confidence interval	
		Lower limit of 5% CI	Upper limit
<b>Cut-off</b>	(>) 85.6	-	-
<b>Sensitivity, %</b>	71.18	63.74	77.85
<b>Specificity, %</b>	72	62.13	80.52
<b>PPV, %</b>	81.21	73.39	86.02
<b>NPV, %</b>	59.5	51.13	70.26
<b>AU-ROC</b>	0.798	0.745	0.852
<b>Odds Ratio</b>	1.0126	1.0091	1.0165
<b>p-value</b>	<b>&lt; 0.001*</b>		

\* indicates statistical significance.



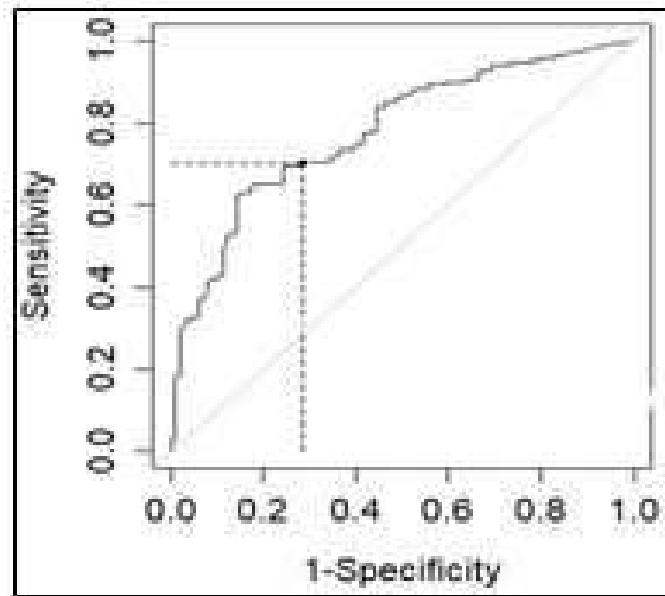
**Graph 14: ROC curve for HsCRP in predicting severity of COVID-19**

For d-Dimer the optimum cut off was >654ng/mL with corresponding specificity, sensitivity and AUC of 69.94% (95% CI: 64.64% - 74.87%), 71.72% (95% CI: 61.78% - 80.31%) and 0.78(95% CI: 0.73, 0.829). From univariate logistic regression, the odds ratio (95% CI) for D-dimer was 1.0126(1.0091, 1.0165); p< 0.001, Table 18), Graph 15 shows the AU-ROC of D-dimer.

**Table 19: Optimal cut-off and accuracy indices of d-Dimer in predicting severity**

Statistics	Value	95% Confidence interval	
		Lower limit of 5% CI	Upper limit
<b>Cut-off</b>	(>) 654	-	-
<b>Sensitivity, %</b>	69.94	64.64	74.87
<b>Specificity, %</b>	71.72	61.78	80.31
<b>PPV, %</b>	89.06	83.85	91.25
<b>NPV, %</b>	42.01	36.28	53.82
<b>AU-ROC</b>	0.78	0.73	0.829
<b>Odds Ratio</b>	1.0005	1.0004	1.0007
<b>p-value</b>	<b>&lt; 0.001*</b>		

\* indicates statistical significance.

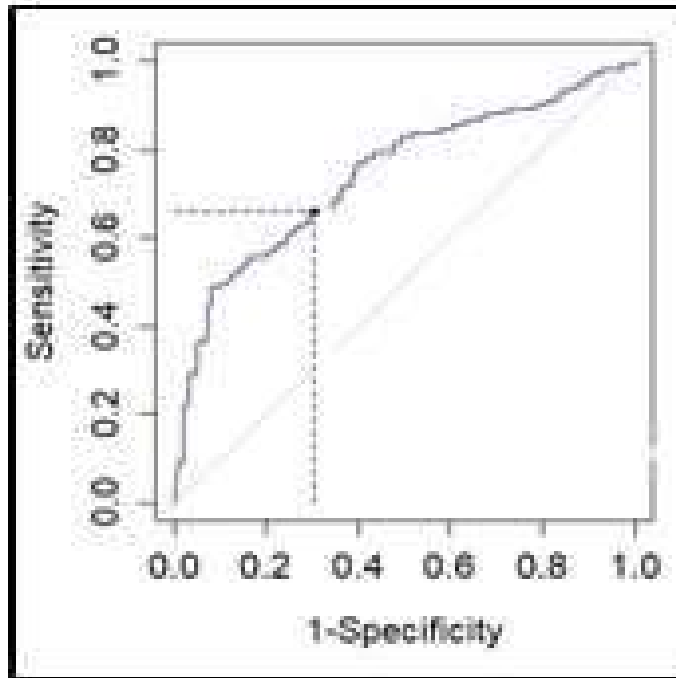


**Graph 15: ROC curve for d-Dimer in predicting severity of COVID-19**

For IL-6 the optimum cut off was >42.8pg/mL with corresponding specificity, sensitivity and AUC of 66.04% (95% CI : 60.54% - 71.23%), 69.7% (95% CI :59.65% - 78.53%) and 0.743 (95% CI : 0.692, 0.794). From univariate logistic regression, the odds ratio (95% CI) for D-dimer was 1.0007 (0.9998, 1.0018) which was statistically non-significant (p=0.0775; Table 19), Graph 16 shows the AU-ROC of D-dimer.

**Table 20: Optimal cut-off and accuracy indices of IL-6 in predicting severity**

Statistics	Value	95% Confidence interval	
		Lower limit of 5% CI	Upper limit
<b>Cut-off</b>	(>) 42.8	-	-
<b>Sensitivity, %</b>	66.04	60.54	71.23
<b>Specificity, %</b>	69.7	59.65	78.53
<b>PPV, %</b>	87.5	81.81	89.91
<b>NPV, %</b>	38.98	33.52	50.40
<b>AU-ROC</b>	0.743	0.692	0.794
<b>Odds Ratio</b>	1.0007	0.9998	1.0018
<b>p-value</b>	0.0775		



**Graph 16: ROC curve for IL-6 in predicting severity of COVID-19**

## DISCUSSION

COVID-19 is a multisystem disease caused by a diffuse systemic process involving a complex interaction of immunological, inflammatory, and coagulative cascades, rather than a localised respiratory infection<sup>47</sup>. Clinicians face various issues as a result of the continuing coronavirus disease 2019 (COVID-19) pandemic. To improve as many lives as possible, quick diagnosis and hospitalisation, risk classification, effective utilisation of intensive care services, selection of appropriate therapies, monitoring, and timely discharge are all critical<sup>7</sup>. Although clinical evaluation is necessary, laboratory markers, often known as biomarkers, can give additional, objective data that can have a significant impact on these elements of patient care<sup>48</sup>. Therefore, current study was conducted to evaluate the correlation between blood Biomarkers at the time of admission with severity and final clinical outcome in COVID 19 patients to identify patients with severe disease allowing for early and appropriate treatment.

In the present study, a total of 532 COVID-19 positive patients were examined at the time of admission to the hospital. Initial clinical status and laboratory biomarker levels (Ferritin, LDH, HsCRP, IL-6 and D-dimer) of the patients were recorded and compared with the final outcome of the disease. The results revealed that 532 patients, 315(59.21%) had mild, 117(21.9%) had moderate and 100(18.80%) had severe disease 100(18.80%). Severity was related to the age, gender and elevated levels of biomarkers. According to our results 50% of the patients with age between 60-79 years were with severe disease. Similar findings were reported that individuals above 60 years and people with co-morbidities are more prone to COVID-19 severity<sup>49,50</sup>. Higher prevalence of severe disease was seen in elderly patients due to comorbidities and decreased immunity.

Higher prevalence of disease severity was seen significantly more in male patients in our study due to increased risk and duration of exposure and this is consistent with the findings of Jian-Min., (2020) who found that men with COVID-19 are more likely to have worst outcome and death<sup>51</sup>. Hence, gender can be considered as the risk factor for increased severity and mortality independent of age and disease susceptibility.

The present study reveals the association of laboratory biomarker levels with respect to poor outcome of the patients. Several research have looked into the association between laboratory biomarkers and disease severity<sup>8, 52-60</sup>. However, although most studies have found a link between a single biomarker and disease severity, we have attempted to demonstrate a relationship between multiple biomarkers with severity and outcome in our research.

The major finding of the study is that all the biomarkers studied on admission were independent predictors of in-hospital death in patients with COVID-19. Our study attempts to establish cut-off values for identification of severe COVID-19 with bad prognosis.

The predicted cut off value for ferritin to distinguish severe and non-severe disease estimated from our study was 437.1ng/mL with sensitivity of 69.63%, specificity of 69.39%, PVV of 88.33% and NPV of 40.72%. Mean ferritin levels in mild, moderate and severe disease is 371.95, 568.39, 955.45 respectively with p value <0.001 indicating statistical significance. Ferritin has been identified as an acute phase reactant as well as a modulator of immunological dysregulation in COVID-19 patients with severe disease<sup>61</sup>. Patients with severe COVID-19 have been reported to have elevated ferritin levels as well as a cytokine storm, leading to speculation that COVID-19 might be part of the hyperferritinemia spectrum<sup>62,63</sup>. Zhou et al., (2020) reported

that, individuals with very severe COVID-19 exhibited significantly higher serum ferritin levels, than individuals with severe COVID-19 group (1006.16 ng/ml (IQR: 408.265-1988.25) vs 291.13 ng/ml (IQR: 102.1-648.42), respectively)<sup>64</sup>. Chen et al. also looked at the clinical features of 99 individuals, finding that 63 of them had serum ferritin levels that were significantly higher than the normal range<sup>65</sup>. Another study found that ferritin levels were high at admission to the hospital and during the hospital stay in individuals who died with COVID-19. After day 16 of hospitalization, the median serum ferritin levels in these patients exceeded the upper limit of detection, indicating the nonstop increase in ferritin levels<sup>25</sup>. Autopsies of 12 individuals who died as a result of SARS-CoV-2 infection also revealed elevated ferritin levels<sup>66</sup>. In comparison to individuals with less severe COVID-19, ferritin levels in the peripheral blood of 69 patients with severe COVID-19 were shown to be higher<sup>67</sup>. All of these laboratory findings in COVID-19 patients were consistent with increased ferritin, which has been linked to serious and life-threatening disease. In our analysis, the OR was 1.001 (1.0007, 1.0014), indicating that every unit increase in ferritin levels resulted in a one-fold increase in disease severity.

The predicted cutoff value for LDH to distinguish between patients with severe and Non severe disease was 415U/L with sensitivity and specificity of 73.04% and 75.76% respectively along with 90.66% PVV and 46.58% NPV. The calculated OR was 1.0055 (1.0042, 1.0069) indicating the increase in severity with increasing LDH level. Mean LDH in mild, moderate and severe disease are 329.61, 437.76 ,659.82 respectively with p value ,0.001 indicating statistical significance. LDH secretion is activated by cell membrane necrosis, which could indicate viral infection or lung injury, such as pneumonia caused by SARS-CoV-2<sup>68</sup>. Multiple studies have showed LDH to be a predictor of poor outcomes in hospitalised patients, similar to our findings. There

is compelling evidence that LDH levels are linked to the onset of COVID-19 disease<sup>69</sup>. Our study had higher cut of value compared to other studies and is more reliable due to larger sample size. Elevated LDH has been linked to an increased risk of ARDS, the need for intensive care, and mortality<sup>70</sup>. One of the studies has reported that ICU patients had considerably higher levels of LDH than non-ICU patients (248 U/L vs 151 U/L,  $p=0.002$ ). Elevated LDH levels were linked to a 6-fold increase in the risk of severe COVID-19 disease in a pooled analytic study. Increased LDH also was linked to a >16-fold increase in mortality risk. In the trials that were considered for this pooled analysis, the LDH cut-off ranged from 245 to 253.2 U/L<sup>60</sup>. Li et al., (2020), reported that a cut-off of 359.50 U/L for serum LDH levels predicted COVID-19 death with 93.8% sensitivity and 88.2 % specificity. Our study had higher cut off value of 415 IU/L is more significant as it has larger sample size. The elevated LDH level was an independent risk factor for COVID-19 severity (HR: 2.73, 95 % CI: 1.25-5.97;  $P=0.012$ ) and mortality (HR: 40.50, 95% CI: 3.65-449.28;  $P=0.003$ ), according to logistic regression analysis and the Cox proportional hazards model, respectively<sup>71</sup>. As a result, a high LDH level at admission is an independent risk factor for COVID-19 severity and mortality. Because the LDH levels utilised in the study were taken at the time of admission, LDH levels could be used in deciding future COVID-19 severity and mortality risk.

The level of 85.6 mg/mL admission CRP with 72 % of specificity and sensitivity of 71.18 % along with 81.21% and 59.5% of PVV and NPV accordingly was found to be good predictor of disease severity. Odds ratio of also indicates the association of elevated CRP level with severity of disease. CRP is one of the most well-known acute phase reactants which rise quickly in response to inflammation, cell damage, or tissue injury. Inflammatory cytokines such as interleukin-6 (IL-6), IL-1, or tumour necrosis

factor-alpha (TNF-) elevate blood CRP levels in pulmonary illnesses due to inflammation<sup>72,73</sup>. As a result, significantly elevated serum CRP levels in non survivors or patients with severe/critical illness in this study showed an excessive inflammatory response, which was consistent with COVID-19 patients' elevated serum proinflammatory cytokines (Huang et al., 2020<sup>74</sup>; Liu et al, 2020<sup>75</sup>). CRP was found to be an independent predictor of severe/critical illness on admission in a study, with a cut off value of 41.4mg/L, sensitivity of 90.5%, specificity of 77.6%, positive predictive value of 61.3 %, and negative predictive value of 95.4 % and the estimated odds ratio of 1.009 (1.002–1.017)<sup>76</sup>. Huang C et al., (2020), reported that a cut-off of 1.60mg/L for CRP levels predicted COVID-19 severity with 77% sensitivity and 72 % specificity along the adjusted-Odds Ratios of 11.46, p = 0.029 and 23.40, p = 0.025, respectively in moderate and severe pneumonia<sup>74</sup>.

In the current study, the estimated cut off value for d-Dimer was 654ng/mL with 72% and 70% of specificity and sensitivity respectively along with 89.06% and 42.01% of PPV and NPV accordingly. The odds ratio of 1.0005(1.0004, 1.0007) indicated the positive association of D-dimer and disease severity. D-dimer elevation has been described as one of the most prevalent laboratory findings in COVID-19 patients who need to be admitted to the hospital. D-dimer is known to be produced by the lysis of cross-linked fibrin, with increased levels indicating coagulation and fibrinolysis activation<sup>27</sup>. COVID-19 has been linked to haemostatic disorders in the past, with one study finding higher levels of D-dimer, among non-survivors compared to survivors<sup>3</sup>. It was reported by Huang et al., that D-dimer levels on admission were greater in patients requiring critical care assistance than in those who did not (500ng/mL as median value). In a study with 1099 COVID-19 patients from more than 550 hospitals in China, it was discovered that nonsurvivors had a considerably greater D-dimer

(median, 2.12g/mL) than survivors (median, 0.61 g/mL)<sup>77</sup>. Zhang et al., (2020), reported that D-dimer on admission greater than 2.0µg/mL (fourfold increase) could effectively predict in-hospital mortality in patients with COVID-19<sup>27</sup>. According to studies, approximately 90% of pneumonia inpatients had enhanced coagulation activity and rising D-dimer levels<sup>78</sup>. With enough evidence from the literature, it is obvious that D-dimer could be a useful early marker for improving COVID-19 patient treatment.

IL- 6 in the current study, as an independent factor was suggestively significant with p value=0.0775 (significance at 91% confidence interval). IL-6 exhibited as an independent discriminator of severe and non-severe disease with cut-off value 42.8 pg/mL with sensitivity and specificity of 66.04% and 69.7% respectively along with 87.5% PPV and 38.98% NPV. The indication of increased CRP level with advanced severity of disease was evident with odds ratio 1.0007 (0.9998, 1.0018). In a cohort of 43 cases, it was discovered that a cut-off value of 24.3 pg/ml of IL-6 combined with D-dimer for early diagnosis of severe cases<sup>79</sup>. In a cohort of 77 patients, Giofoni et al., found a cut-off value of 25 pg/ml of serum IL-6 as an independent risk factor for severe COVID-19 and/or in-hospital mortality<sup>80</sup>. A meta-analysis included nine trials (1426 patients) and indicated that a greater serum level of IL-6 was linked to an increased risk of complicated COVID-19 and death with an estimated cut-off value of 55 pg/ml<sup>81</sup>. Zhang et al., discovered that a serum IL-6 cut-off of 37.65 pg/ml predicted death with good sensitivity and specificity<sup>82</sup>. IL-6 appears to be a possible predictor of severe COVID-19 development and could be used to identify patients who require early hospitalisation.

In our study we found positive correlation between raised inflammatory marker levels with mortality. HsCRP had highest correlation of 45% followed by LDH of 42%. Ddimer and IL6 also had significant relation to mortality and survival of 30% , 25% .

Our study was more significant as the total number of patients included in our study are significantly higher compared to other studies.

**Limitations of the study**

- Cross sectional and retrospective nature of the study with its inherent limitations and we could not follow up patients.
- Single centre study

## **CONCLUSION**

According to our study, changes in laboratory biomarkers (Ferritin, LDH, HsCRP, IL-6 and D-dimer) appear to have a substantial role in the course of COVID-19. These markers could aid in the early identification of high-risk patients and help to avoid the complications that come with disease severity. Different definitions of COVID-19 disease severity and discrepancies in the cut-off values for biomarkers in our analysis compared to other studies could explain the heterogeneity. Since all the biomarkers levels utilised in the study were taken at the time of admission and their proven association with disease progression, proposed cut-offs for Ferritin, LDH, HsCRP, IL-6 and D-dimer could be used in predicting the prognosis of the COVID-19 patients at the time of admission allowing more timely treatment.

## **SUMMARY**

The present cross-sectional study was carried out to evaluate the risk and severity in COVID-19 patients at the time of admission by using simple and easy laboratory markers and stratify the patients accordingly. Additionally, to evaluate the correlation between the most commonly used markers HsCRP, IL6, Serum ferritin, D-dimer, LDH with disease severity and final clinical outcome. Institutional ethical clearance was obtained prior to initiation of the study. The details of the study were explained to the patients and an informed consent was obtained from all patients

A total of 532 patients adult and paediatric patients diagnosed with COVID-19 based on RT PCR, CBNAAT, and Rapid Antigen test and admitted in in the corona care unit of KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi from January 2021 to December 2021 were included in the study. Patients below 18 years and above 65 years of age, pregnant women and patients with incomplete records were excluded. A detailed history including demographics, symptoms, comorbidities, oxygenation parameters (SPO<sub>2</sub>), laboratory biomarker levels (serum Ferritin, LDH, HsCRP, IL-6 and d-Dimer) were recorded at the time of admission.

Depending on the oxygen saturation COVID-19 Patients were categorized into three groups: mild, moderate or severe. Disease progression was also monitored during the course. Outcome of the patient was measured in the form of improvement or death. The obtained Data was analysed using statistical software R version 4.1.2. Comparison of disease severity with demographics, symptoms, comorbidities was assessed. Effect of disease severity on disease outcome was also assessed. The optimum cut off values for individual biomarkers which will predict the disease severity and outcome was estimated. Further, the sensitivity and specificity of the biomarkers in predicting the severity of COVID -19 were analysed.

Patients belonged to the age group of 18 to 93 years having a median age of 55 years and mean  $\pm$  standard deviation (SD) age of  $53.09 \pm 17.13$  years. majority of the study population comprised of males (n=422, 79.32%). In our study, 47(8.83%) patients were found asymptomatic. Most common symptoms were cough (n=304, 57.41%), fever (n=319, 56.58%) and breathlessness (n=301, 59.96%); Diabetes Mellitus (n=200, 37.59%) was the most commonly reported comorbidity in our study population, followed by hypertension (n=165, 31.02%), At the time of admission, 100(18.80%) of the 532 patients studied had severe disease, while the 315(59.21%) had mild and 117(21.9%) had moderate disease

Mean  $\pm$  SD SPO<sub>2</sub> of the patients at the time of admission was recorded to be  $91.91 \pm 9.75$  %. Overall mean values of Ferritin, LDH, HsCRP, IL-6 and d-Dimer of study population were found to be elevated. The Mean  $\pm$  SD value of Ferritin, LDH, HsCRP, IL-6 and D-dimer was  $551.75 \pm 684.52$ ng/mL,  $431.1 \pm 288.81$ U/L,  $99.13 \pm 108.52$  mg/L,  $108.67 \pm 300.36$ pg/mL, and  $934.59 \pm 1269.92$  ng/mL, respectively. Among 532 patients admitted, 100 (18.8%) patients succumbed to COVID-19 and 432(81.2%) were alive.

Significant difference in the mean  $\pm$  SD age between mild, moderate and severe disease ( $48.68 \pm 17.69$  years vs.  $55.89 \pm 13.48$  years vs.  $63.74 \pm 13.48$  years;  $p < .10.001$ ). The difference in the distribution of patients with disease severity between males and females was significant ( $p = 0.0166$ ). A higher number of patients with mild severity were asymptomatic compared to moderate and severe disease ( $p = 0.0348$ ). Significant difference in the occurrence of breathlessness was observed between different disease severities ( $p < 0.001$ ). Association of other symptoms and disease severity were not significant ( $p > 0.05$ ). Comorbidities such as Diabetes

Mellitus( $p<0.001$ ), hypertension( $p<0.001$ ), ischemic heart disease( $p=0.0419$ ), chronic kidney disease ( $p=0.033$ ) were significantly associated with disease severity.

Mean  $\pm$  SD SPO<sub>2</sub> was significantly lower in patients with severe disease than patients with mild and moderate disease ( $84.9 \pm 14.11$  vs  $94.9 \pm 4.82$  vs  $89.69 \pm 11.54$ ;  $p<0.001$ ). Significant increase in the Mean  $\pm$  SD values of Ferritin ( $955.45 \pm 856.16$ ng/mL vs  $371.95 \pm 535.96$  ng/mL vs  $568.39 \pm 630.85$  ng/mL;  $p<0.001$ ), LDS ( $659.82 \pm 409.11$ U/L vs  $329.61 \pm 152.05$ U/L vs  $437.76 \pm 250.13$ U/L;  $p<0.001$ ), HsCRP ( $163.8 \pm 128.8$ mg/L vs  $46.66 \pm 59.66$ mg/L vs  $94.73 \pm 84.74$ mg/L;  $p<0.001$ ), IL-2 ( $166.95 \pm 226.87$  pg/mL vs  $53.85 \pm 98.13$ pg/mL vs  $182.02 \pm 565.7$ pg/mL;  $p<0.001$ ) and d-DIMER ( $1691.14 \pm 1746.6$  vs  $620.29 \pm 901.5$  vs  $926.53 \pm 1131.06$  ;  $p<0.001$ ) values were observed in patients with severe disease than those with mild and moderate disease.

The estimated optimum cut off values for ferritin LDH, HsCRP, D-dimer and IL-6 were  $> 437.1$ ng/mL,  $>415$ U/L,  $>85.6$  mg/L,  $>654$ ng/mL and  $>42.8$ pg/mL respectively. Early identification of patients who would develop severe grade of disease and active initiation of treatment could be possible.

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ANNEXURE - I –  
INFORMED CONSENT

INFORMED CONSENT

INFORMED CONSENT

Dear Mr./Mrs \_\_\_\_\_ you are kindly requested to  
enroll yourself in a research study titled,

**“STUDY OF CORELATION BETWEEN LABORATORY BLOOD BIOMARKERS AT THE TIME OF  
ADMISSION WITH FINAL CLINICAL OUTCOME IN COVID 19 PATIENTS”- A ONE YEAR HOSPITAL  
BASED CROSS-SECTIONAL STUDY** being conducted by \_\_\_\_\_ REGN NO.: BG0120005

\_\_\_\_\_, a post graduate student in M.D. General Medicine and the study will be carried out  
under the direct supervision and guidance of \_\_\_\_\_, Associate Professor,  
Department of General Medicine, Jawaharlal Nehru Medical College, Belgaum.

You have been requested to participate in this as you fit into the laid-out criteria for a study  
'subject'/ participant. Your participation in study is voluntary. During the study you will be  
undergoing few routine blood investigations. Your decision whether or not to participate in the  
study will not affect your treatment in any form. If you decide to participate you are free to  
withdraw at any time.

**TITLE OF THE STUDY:**

**“STUDY OF CORELATION BETWEEN LABORATORY BLOOD BIOMARKERS AT THE TIME OF  
ADMISSION WITH FINAL CLINICAL OUTCOME IN COVID 19 PATIENTS”- A ONE YEAR HOSPITAL  
BASED CROSS-SECTIONAL STUDY**

**PURPOSE OF THE STUDY:** To predict the outcome and prognosis of covid infected patients at  
the time of admission by laboratory biomarkers.

**PROCEDURES INVOLVED:** If you agree to enroll yourself in my study, you will be clinically  
examined in detail and investigated for the below said investigations accordingly.

1. D DIMER
2. SR FERRITIN
3. LDH
4. CRP
5. ILG

**RISKS AND BENEFITS:**

There are no potential risks involved in this study. Benefits of taking part in this research are

- We can be able to establish a relation between ferritin, D dimer, LDH, HsCRP,IL6 and severity of disease.
- To identify people who are at risk of progressing to complications.
- **VOLUNTARY PARTICIPATION / WITHDRAWAL FROM THE STUDY:** Taking part in the study is voluntary. You may choose not to enroll yourself in this study and may choose to leave the study anytime in between.
- **ALTERNATIVES:** Your decision regarding participation in study will not change present or future health care services offered to you at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum. You would simply be excluded from the study if you wish to, and all your details shall be kept confidential and you will get the routine line of management.

**PRIVACY AND CONFIDENTIALITY:** All data collected or disclosed by you during the course of participation of study, will be kept fully confidential. If however during the course it becomes necessary for the progress of the course to disclose the identity, it would be done only after your informed consent. The only people to know that you are a research subject are members of the research team. No information about you will be disclosed to other without your written permission except: - In emergency to protect your rights AND welfare. - If required by law.

**AUTHORIZATION TO PUBLISH RESULT:** The results of the study may be used to publish an article. When the results of research published or discussed, in a conference, no information will be displayed that would disclose your identity. Any information obtained in connection with this study and that can be identified with you will remain confidential.

**FINANCIAL INCENTIVES FOR PARTICIPATION:** No additional costs shall be incurred upon you for the purpose of this study. It is purely being done with the idea of research

**COMPENSATION:** In the event that you become injured as a result of taking part in this study, treatment will be offered to you at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum, or you will be given information about where to receive medical care. However, no reimbursement, compensation or free medical care will be given.

2.

**QUESTIONS/CONTACT DETAILS:** You shall be free to contact the below mentioned name & addresses anytime during the study period for any clarification or help as you may desire for

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

**1. DR HARSHA HEGDE, CHAIRPERSON, JNMC, IEC AND SCIENTIST , ICMR, NATIONAL INSTITUTE OF TRADITIONAL MEDICINE,  
BELAGAVI 9480422500**

**2 Dr | ,  
Dept of Gen Medicine, JNMC 9738462380**

**3 REGN NO.: BG0120005 , JR1 Gen Medicine,  
JNMC**

CONSENT FORM

I voluntarily agree to take part in this study by signing below. I may withdraw at any time. I am not giving 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 questions answered.

Signature / thumb impression of participant

Participant's name

Signature of experimenter

Name of experimenter

Signature/thumb impression of witness

Name of witness

Date :

## रूचित सहमति

प्रिय श्री / श्रीमती \_\_\_\_\_ आपसे विनाश निवेदन है कि स्वयं को एक शोध अध्ययन में भाग लेने का निर्णय लेने के लिए सहमत हैं,

"उत्तर प्रदेश विश्वविद्यालय के छात्रों और छात्रों के लिए शैक्षणिक पाठ्यक्रम के तहत छात्रों के साथ शैक्षणिक सहयोग और शून्य शिक्षण की परीक्षाएं, 19 वीं कक्षा में प्रवेश के लिए आवेदन पत्र" सामान्य चिकित्सा और अध्ययन डीआर के प्रत्यक्ष पर्यवेक्षण और मार्गदर्शन के तहत किया जाएगा। एसीएसएट प्रोफेसर, सामान्य चिकित्सा विभाग, जवाहरलाल नेहरू मेडिकल कॉलेज, खेनगान।

आपको इसमें भाग लेने का अनुमोदित किया गया है क्योंकि आप एक अध्ययन के लिए निर्धारित मानकों में फिट होते हैं (विद्यार्थी / प्रतिभागी)। अध्ययन में आपकी जानीबारी स्पष्ट है। अध्ययन के दौरान आप कुछ नियमित रक्त जांच से गुजरेंगे। अध्ययन में भाग लेने या न लेने का आपका निर्णय किसी भी रूप में आपके उपचार को प्रभावित नहीं करेगा। यदि आप भाग लेने का निर्णय लेते हैं तो आप किसी भी समय वापस लेने के लिए स्वतंत्र हैं।

## अध्ययन का तीर्थक:

\*बलौंगर 19 इंग्लैंड के साथ पैटेंट में उम्मीदवारी के साथ एसीएसएटेशन क्लिनिकल प्रोफेसर और प्रैक्टिसरी प्रायोगिक के अध्ययन के पाठ्यक्रम", KLE DRBB-JAAR कोरिया अस्पताल में एक शैक्षिक और प्रगतिशील शैक्षिक पाठ्यक्रम।

अध्ययन का उद्देश्य: प्रयोगशाला प्रायोगिकों द्वारा प्रवेश के समय कोविड संक्रमित रोगियों के परिणाम और पूर्वानुमान को अतिव्यवस्था करना।

प्रस्तुत किए गए प्रावधान: यदि आप गैरे अध्ययन में कुछ बने सामांलिक करने के लिए सहमत हैं, तो आपको चिकित्सात्मक रूप से विरहण से जांच की जाएगी और नोके दी गई जांच के अनुसार जांच की जाएगी।

D DIMER

केवल यह जानने के लिए कि आप एक शोध विषय हैं, अनुसंधान टीम के सदस्य हैं। आपके लिखित अनुमति के बिना अन्य के बारे में आपको कोई जानकारी नहीं दी जाएगी; - आपातकाल में अपने अधिकारों और कल्याण की रक्षा के लिए; - यदि कानून द्वारा आवश्यक हो।

प्रकाशन परिणाम के लिए सुधार: अध्ययन के परिणामों का उपयोग किसी संघ को प्रकटीकृत करने के लिए किया जा सकता है; जब एक सम्मेलन में प्रकाशित या चर्चा किए गए शोध के परिणाम, कोई भी जानकारी प्रदर्शित नहीं की जाएगी जो आपकी पहचान का खुलासा करेगी। इस अध्ययन के संबंध में प्रश्नों की गई कोई भी जानकारी और जो आपके साथ गहवानी जा सकती है, वह गोपनीय रहेगी।

उत्पीड़ना के लिए वित्तीय प्रोत्साहन: इस अध्ययन के उद्देश्य से आपके लिए कोई अतिरिक्त लागत नहीं होगी। यह निरुद्ध रूप से अनुसंधान के विचार के साथ किया जा रहा है।

हतिपूर्ति: इस अध्ययन में भाग लेने के परिणामस्वरूप 304 धातल हो जाते हैं, केएलईएस डॉ। प्रभाकर कोरे अस्पताल और मेडिकल रिसर्च सेंटर, बेलगान में उपचार की पेशकश की जाएगी, या आपको यह जानकारी दी जाएगी कि चिकित्सा कहाँ से प्राप्त करें। देखभाल। हलांकि, कोई प्रतिपूर्ति, मुआयजा या मुफ्त चिकित्सा देखभाल नहीं दी जाएगी।

घरन / संपर्क विवरण: आप किसी भी स्पर्डीकरण या मदद के लिए अध्ययन की अवधि के दौरान किसी भी समय नीचे दिए गए नाम और पते से संपर्क करने के लिए स्वतंत्र होंगे।

1. अध्ययन के दौरान या अवधि में प्रश्नों के मामले में 24 घंटे निम्नलिखित स्थितियों से संपर्क कर सकते हैं,

डॉ. हर्षो HEGDE, CHAIRPERSON, JMMC, IECAND SCIENTIST ICMR जेएमएम इंस्टीट्यूट ऑफ ट्रेडिशनल मेडिसिन  
BELAG

2.

जेपीएमसी 9738462360 पर ट्विपार्टीट ऑफ जेएमएम मेडिसिन

3. REGN NO.: BG0120005 जेआर 1 जेएमएम मेडिसिन,

जे जेएमएमसी 9849989859

माहितीपूर्ण संयंती

प्रिय श्री /Mrs \_\_\_\_\_ आपणारा विनम्र विनंती आहे

दुकतेल्या एका संशोधन अभ्यासामध्ये स्वतः चा सहभाग नोंदवा,

प्रयोगशाळेच्या दरम्यान रक्तरजित रक्ताच्या बाईमारकाच्या वेळी अभ्यास अभ्यास

१५ रुग्णांच्या अंतिम क्लिनिकल स्वयंचलितरित्या अॅडमिशन - एक वर्षाचे रुग्णालय

बेसड कॅस-सेव्हानल स्टडी

एम.डी. जनरल मेडिसिनमधील पदव्युत्तर विद्यार्थी आणि अभ्यास केला जाईल

डायरेक्ट यांच्या देखरेखीखाली आणि मार्गदर्शनखाली सहयोगी प्राध्यापक,

सामान्य औषध विभाग, जवाहरलाल नेहरू मेडिकल कॉलेज, बेळगाव.

आपण अभ्यासाच्या निकषांनुसार बसत असल्यामुळे आपल्याला यात सहभागी होण्याची विनंती केली गेली आहे

'विषय' / सहभागी. अभ्यासात आपला सहभाग ऐच्छिक आहे. अभ्यासादरम्यान आपण व्हाल

काही नियमित रक्त तपासणी चालू, मध्ये भाग घ्यायचा की नाही हा आपला निर्णय

अभ्यासाचा कोणत्याही प्रकारे आपल्या उपचारांवर परिणाम होणार नाही. आपण सहभाग घेण्याचे ठरविल्यास आपण मोकळे आहात

कधीही माघार घ्या.

अभ्यासाचे शीर्षक:

त्या वेळी प्रयोगशाळेच्या रक्तात असलेल्या बायोमार्करांस यांच्यासमवेत अभ्यास अभ्यास

१५ रुग्णांच्या अंतिम क्लिनिकल स्वयंचलितरित्या अॅडमिशन - एक वर्षाचे रुग्णालय

बेसड कॅस-सेव्हानल स्टडी

आगासाचा हेतू: कोविड संक्रमित रुग्णांच्या परिणामाचा व रोगनिदानाचा अंदाज वर्तविणे

प्रयोगशाळेच्या बायोमार्करांद्वारे प्रवेशाची वेळ.

प्रक्रियेमध्ये समाविष्ट: आपण माझ्या अभ्यासामध्ये स्वतः ला नावनोंदणी घेण्यास सहमत असल्यास आपण नैदानिक असाल

तपशीलवार तपासणी केली आणि त्यानुसार पुढील तपास केला.

1. डी टिगर

2. एसआर फेरिटिन

3. एलडीएच

C.R. सीआरपी

5. आयएल 6

... अभ्यास करण्याच्या कालावधीत किंवा काही प्रश्नांच्या बाबतीत जेव्हा आपण जवळच्या लोकांकडून संपर्क साधता येतो.

जोखीम आणि फायदे: या अभ्यासामध्ये कोणत्याही संभाव्य जोखीमचा समावेश नाही, भाग घेण्याचे फायदे या संशोधनात

○४ कोव्हिडी १९ मध्ये क्लिनिकल निकालाबद्दल प्रवेश बायोमार्कर्स दरम्यान संबंध स्थापित करणे प्रवेशाच्या वेळी पूर्वानुमानाचा अंदाज लावण्यासाठी स्कोअरिंग सिस्टम विकसित करणे अभ्यासाकडून व्हॉलंट्री पार्टिशन / अभ्यासक्रम: अभ्यासात भाग घेणे हे आहे ऐच्छिक आपण या अभ्यासामध्ये स्वतःची नाइनोदणी न करणे निवडू शकता आणि ते सोडू शकता दरम्यान कधीही अभ्यास.

अल्टरनेटिव्ह्ज: अभ्यासाच्या सहभागासंदर्भात घेतलेला आपला निर्णय वर्तमान किंवा भविष्यकाळ बदलणार नाही

प्रभाकर कोरे रुग्णालय व वैद्यकीय संशोधन येथे केएलईएस येथे तुम्हाला देण्यात आलेल्या आरोग्य सेवा सेवा

केंद्र, बेळगाव, आपण इच्छित असल्यास आपल्याला फक्त अभ्यासापासून वगळले जाईल आणि आपल्या सर्व

तगशील गोपनीय ठेवण्यात येईल आणि आपल्याला नियमित व्यवस्थापनाची ओळ मिळेल.

गोपनीयता आणि गोपनीयता: आपल्या दरम्यान गोळा केलेला किंवा उघड केलेला सर्व डेटा

अभ्यासाचा राहभाग पूर्णपणे गोपनीय ठेवला जाईल, जर कोर्स दरम्यान असेल तर

कोर्सच्या प्रगतीसाठी ओळख जाहीर करणे आवश्यक आहे, नंतरच केले जाईल

आपली माहिती संमती. आपण संशोधन विषय आह्रात हे फक्त लोकांनाच माहित आहे की सदस्य आहेत

संशोधन यथकाचा. आपल्याबद्दल कोणतीही माहिती आपल्या लेखी शिवाय इतरांना प्रकट केली जाणार नाही

परवानगी वगळता: - आपत्कालीन परिस्थितीत आपले हक्क आणि कल्याण यांचे संरक्षण करण्यासाठी - कायद्याने आवश्यक असल्यास.

प्रकाशन परिणाम प्रमाणीकरण: अभ्यासाचे परिणाम प्रकाशित करण्यासाठी वापरले जाऊ शकतात तेव्हा, जेव्हा संशोधनाचे निकाल कॉन्फरन्समध्ये प्रकाशित होतात किंवा त्यावर चर्चा केली जाते तेव्हा कोणतीही माहिती नसते

प्रदर्शित होईल जे आपली ओळख उघड करतील, संबंधित कोणतीही माहिती

हा अभ्यास आणि तो आपल्यास ओळखला जाऊ शकतो गोपनीय राहिल.

सहभागासाठी वित्तीय संस्था: यासाठी कोणतेही अतिरिक्त शुल्क तुमच्यावर घेतले जाणार नाही

या अभ्यासाचा हेतू, हे पूर्णपणे संशोधन आणि सर्व खर्चाच्या कल्पनांनी केले जात आहे

अभ्यास अन्वेषक घेईल

नुकसान भरपाई: या अभ्यासामध्ये भाग घेतल्यामुळे आपण जखमी झाल्यास,

प्रभाकर कॉरे हॉस्पिटल आणि वैद्यकीय संशोधन येथे केएलईएस डॉ

सेंटर, बेळगाव किंवा आपल्याला वैद्यकीय सेवा कोठे मिळवायची याबद्दल माहिती दिली जाईल.

तथापि, कोणतेही प्रतिपूर्ती, भरपाई किंवा विनामूल्य वैद्यकीय सेवा दिली जाणार नाही.

प्रश्न / संपर्क तपशील: आपण खाली नमूद संपर्क साधू शकता

अभ्यासाच्या कालावधीत कोणत्याही स्पष्टीकरणासाठी किंवा आपण म्हणून केलेल्या मदतीसाठी कधीही नाव आणि पत्ते

इच्छा असू शकते

अभ्यासाच्या वेळी किंवा भविष्यातील प्रश्नांच्या बाबतीत आपण खालील व्यक्तींशी संपर्क साधू शकता,

१. डीआर हर्षा हेगडे, चेपर्सन, जेएनएमसी, आयईसी आणि विज्ञान, आयसीएमआर, नॅटिनाॅल

पारंपारिक औषधाची संस्था,

बेळगावची 9480422500

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जनरल मेडिसिन विभाग, जेएनएमसी

३ REGN NO.: BG0120005

जेआर 1 जनरल मेडिसिन,

जेएनएमसी

ಮಾಹಿತಿ ಪತ್ರಗಳು

ಅಧ್ಯಯನ ಕ್ರೀಡೆ / ಕ್ರೀಡೆಗಳು \_\_\_\_\_ ನಿಮ್ಮನ್ನು ದಯಮಿ೦ದ ವಿಸ೦ಹಿಸಲಾಗಿದೆ

ಓರೆಯಾದ ಸಂಕೋಧನಾ ಅಧ್ಯಯನಕ್ಕೆ ನಿಮ್ಮನ್ನು ಸೇರಿಸಿಕೊಳ್ಳಿ.

"ಉಚಿತವಾಗಿ ಒಂದು ಬಾರಿ ಬರೆಯುವುದು ರೋಗಿಗಳ ಸಮಸ್ಯೆಗಳನ್ನು ಕೊನೆಗೊಳಿಸಲು ಅಧ್ಯಯನ

ಕೋವಿಡ್ 19 ರೋಗಿಗಳಲ್ಲಿ ಅಂತಿಮ ಕ್ಲಿನಿಕಲ್ ಕಾರ್ಯದೊಂದಿಗೆ ನಿರ್ವಹಣೆ " - ಒಂದು ವರ್ಷದ ಅಧ್ಯಯನ

REG NO. 0012005 ನಡೆಸುತ್ತಿರುವ ಆಧಾರಿತ ಡ್ಯಾನ್ ಸೆಂಟರ್ ಸ್ಪೆಷಿ

ಎಂ.ಡಿ. ಜನರಲ್ ಮೆಡಿಸಿನ್ ನಲ್ಲಿ ಪ್ರಾಚಾರ್ಯರ ವಿಭಾಗದ ಡಿಪ್ಲಿ ಮತ್ತು ಅಧ್ಯಯನವನ್ನು ತ್ಯಾಜ್ಯವಾಗಿಸುವುದು

ರೋಗಿಗಳ ಸೇವೆ ಮತ್ತು ಬಾಡಿಗೆ ಮತ್ತು ಮಾರ್ಗದರ್ಶನದಲ್ಲಿ ಸಹಾಯಕ ಪ್ರಾಧ್ಯಾಪಕರು,

ಜನರಲ್ ಮೆಡಿಸಿನ್ ಇಲಾಖೆ, ಜವಾಹರಲಾಲ್ ನೆಹರು ವೈದ್ಯಕೀಯ ಕಾಲೇಜು, ಬೆಳಗಾವಿ.

ಅಧ್ಯಯನಕ್ಕಾಗಿ ನೀವು ನಿಗದಿತವಿರುವ ಮಾನದಂಡಗಳಿಗೆ ಸರಿಪಡಿಸುವುದಕ್ಕೆ ಇದರಲ್ಲಿ ಭಾಗವಹಿಸಲು ನಿಮ್ಮನ್ನು ವಿಸ೦ಹಿಸಲಾಗಿದೆ

"ವಿಷಯ" / ಭಾಗವಹಿಸುವುದು. ಅಧ್ಯಯನದಲ್ಲಿ ನಿಮ್ಮ ಭಾಗವಹಿಸುವಿಕೆ ಸ್ವಯಂಪ್ರೇರಿತವಾಗಿರುತ್ತದೆ. ಅಧ್ಯಯನದ ಸಮಯದಲ್ಲಿ ನೀವು ಇರುತ್ತೀರಿ

ಕೆಲವು ಪರಿಶೀಲನೆ ಮತ್ತು ಪರಿಶೀಲನೆ ಅಳವಡಿಸುತ್ತದೆ. ಭಾಗವಹಿಸುವಿಕೆ ಅಥವಾ ಪಾಲ್ಗೊಳ್ಳುವುದು ನಿಮ್ಮ ನಿರ್ಧಾರ

ಅಧ್ಯಯನದಲ್ಲಿ ನಿಮ್ಮ ಪಾಲ್ಗೊಳ್ಳುವುದು ರೋಗಿಗಳ ಸೇವೆಯಲ್ಲಿ ಸಹಾಯಕವಾಗಿರುತ್ತದೆ. ನೀವು ಭಾಗವಹಿಸಲು ನಿರಾಸಕ್ತರಾದರೆ ನೀವು ಸ್ವತಂತ್ರರು

ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ತಿರಸ್ಕರಿಸುತ್ತೀರಿ.

ಅಧ್ಯಯನದ ಲೇಖಕರು:

"ಉಚಿತವಾಗಿ ಒಂದು ಬಾರಿ ಬರೆಯುವುದು ರೋಗಿಗಳ ಸಮಸ್ಯೆಗಳನ್ನು ಕೊನೆಗೊಳಿಸಲು ಅಧ್ಯಯನ

ಕೋವಿಡ್ 19 ರೋಗಿಗಳಲ್ಲಿ ಅಂತಿಮ ಕ್ಲಿನಿಕಲ್ ಕಾರ್ಯದೊಂದಿಗೆ ನಿರ್ವಹಣೆ " - ಒಂದು ವರ್ಷದ ಅಧ್ಯಯನ

ಆಧಾರಿತ ಡ್ಯಾನ್ ವಿಭಾಗದ ಅಧ್ಯಯನ

ಅಧ್ಯಯನದ ಲೇಖಕರು: ಕೋವಿಡ್ 19 ರೋಗಿಗಳ ಪರಿಣಾಂಕ ಮತ್ತು ಮ೦ವುಗಳನ್ನು ಹಿಡಿಸುವ

ಪ್ರಯೋಗಾಲಯ ಬರೆಯುವುದು ರೋಗಿಗಳಿಂದ ಪ್ರವೇಶದ ಸಮಯ.



ಗುರುತನ್ನು ಒಪ್ಪಂದಾಧಿನಿಯ ಕೋಶ್‌ನ ಪ್ರಗತಿಗೆ ಅಗತ್ಯ ಅಧಿಷ್ಟ ಸಂಕರವೇ ಮಾಡಲಾಗುತ್ತದೆ  
ನಿಮ್ಮ ತಿಳುವಳಿಕೆಯುಳ್ಳ ಒಪ್ಪಿಗೆ, ನಿಮ್ಮ ಸಂಶೋಧನಾ ವಿಷಯ ಎಂದು ತಿಳಿದುಕೊಳ್ಳುವ ಜನರು ಮಾತ್ರ ಸಹಜವಾದ  
ಸಂಶೋಧನಾ ತಂಡದ ನಿಮ್ಮ ಬಗ್ಗೆ ಯಾವುದೇ ಚುಚ್ಚುತಿಯನ್ನು ನಿಮ್ಮ ರಿಷಿಕ್ ಇಲ್ಲದ ಇತರರಿಗೆ ಒಪ್ಪಂದಾಧಿನಿಯುದ್ದಿರಿ  
ಹೊರತುಪಡಿಸಿ ಎಂದು ಹಿ: ನಿಮ್ಮ ಹಕ್ಕುಗಳು ಮತ್ತು ಕಲ್ಯಾಣವನ್ನು ರಕ್ಷಿಸಲು ತುರ್ತು ಪಡಿಸಿತ್ತಿರಬಹುದು. - ಕಾನೂನಿನ ಪ್ರಕಾರ  
ಅಗತ್ಯವಿದ್ದರೆ.

ಫರಿಕಾಂಠವನ್ನು ಪ್ರಸಿದ್ಧಿಯ ಅಧಿಕಾರ: ಅಧ್ಯಯನದ ಫರಿಕಾಂಠಗಳನ್ನು ಪ್ರಸಿದ್ಧಿಯ ಬಳಸಬಹುದು  
ರೇಖನ. ಸುಕೋಪಯೋಗ ಫರಿಕಾಂಠಗಳು ಪ್ರತಿಯಾದ ಅಥವಾ ಚರ್ಚಿಸಿದಾಗ, ಸಮಗ್ರವಾದಲ್ಲಿ, ಯಾವುದೇ ಮಾಹಿತಿ ಅಲ್ಲ  
ನಿಮ್ಮ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸುವಂತಹ ಪ್ರದರ್ಶನಲಾಗುತ್ತದೆ. ಸಂವರ್ತದಲ್ಲಿ ಪಡೆದ ಯಾವುದೇ ಮಾಹಿತಿ.

ಈ ಅಧ್ಯಯನ ಮತ್ತು ಅಡ್ಡು ನಿಮ್ಮೊಂದಿಗೆ ಗುರುತಿಸಬಹುದು ಗೌಪ್ಯವಾಗಿ ಉಳಿಯುತ್ತದೆ.  
ಭಾಗವಹಿಸುವಿಕೆಗಾಗಿ ಹಲವಾರು ಪ್ರಶ್ನಾವ್ಯಕ್ತಿಗಳು: ಯಾವುದೇ ಹಕ್ಕುಪರಿ ವ್ಯಕ್ತಿಗಳು ನಿಮ್ಮ ಬೇರೆ ಅಗತ್ಯವಿಲ್ಲ  
ಈ ಅಧ್ಯಯನದ ಉದ್ದೇಶ. ಇದನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ಸಂಪೂರ್ಣವೆಂದು ತಿಳಿಸಿ ಮತ್ತು ಅಲ್ಲ ವ್ಯಕ್ತಿಯಾದ ಮಾಡಲಾಗುತ್ತಿದೆ  
ಅಧ್ಯಯನ ಮತ್ತು ಅನಿವಾರಿಸಿ ಭರಿಸುತ್ತಾರೆ

ಪರಿಕಾರ: ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಕಾರ್ಯಾಚರಣೆ ಪರಿಣಾಮವಾಗಿ ನೀವು ಗಾಂಧೀಯ ಸಂದರ್ಶನದಲ್ಲಿ,  
ಕೆಂಪುಕೂಡೆ ಇ. ಪ್ರಾಂಶುಪಾಲೆ ಕೂಡೆ ಅಧ್ಯಯನ ಮತ್ತು ವ್ಯವಸ್ಥಾಪಕ ಸಂಶೋಧನೆಯಲ್ಲಿ ನಿಮಗೆ ಬಹಳ ನೋಡಲಾಗುವುದು  
ಕೇಂದ್ರ, ಬೆಂಗಳೂರು, ಅಥವಾ ವ್ಯವಸ್ಥಾಪಕ ಅಧಿಕಾರಿಯನ್ನು ಎಲ್ಲಿ ನಡೆಸಬೇಕು ಎಂದು ಅಗ್ಗೆ ನಿಮಗೆ ಮಾಹಿತಿ ನೀಡಲಾಗುವುದು.  
ಅಂತರ್ಜಾಲ ಯಾವುದೇ ಬದುಕಾದಂತೆ, ಪರಿಕಾರ ಅಥವಾ ಅಂತಹ ವ್ಯವಸ್ಥಾಪಕ ಸೌಲಭ್ಯವನ್ನು ನೀಡಲಾಗುವುದಿಲ್ಲ.

ವ್ಯಕ್ತಿಗಳು / ಸಂವರ್ತ ವಿವರಗಳು: ನೀವು ಬಯಸಿದಂತೆ ಯಾವುದೇ ಸ್ವಲ್ಪಕಾಲದ ಅಥವಾ ಸಹಾಯಕ್ಕಾಗಿ ಅಧ್ಯಯನದ ಅವಧಿಯಲ್ಲಿ  
ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಈ ಕೆಳಗಿನ ಹೆಸರು ಮತ್ತು ವಿಳಾಸಗಳನ್ನು ಸಂಪರ್ಕಿಸಲು ನಿಮ್ಮ ಮುಕ್ತವಾಗಿರಬೇಕು.

. ಅಧ್ಯಯನದ ಸಮಯದಲ್ಲಿ ಅಥವಾ ಬದಿವ್ಯದಲ್ಲಿ ನೀವು ಈ ಕೆಳಗಿನ ವ್ಯಕ್ತಿಗಳನ್ನು ಸಂಪರ್ಕಿಸಬಹುದು.

ಡಿ.ಆರ್. ಕರ್ನಾಟಕ, ಕೆ.ಆರ್.ಪರ್ವಣ್, ಬೆಂಗಳೂರು, ಐ.ಕಾಂಠ್ ಸ್ಕೂಲಿಂಗ್ ಐಸಿಎಂಆರ್ ನ್ಯಾಷನಲ್ ಇನ್‌ಸ್ಟಿಟ್ಯೂಟ್ ಆಫ್  
ಟ್ರೈನಿಂಗ್ ಮೆಡಿಸಿನ್ ಬೆಂಗಳೂರು- 94.80172500

## ANNEXURES – II - PROFORMA

## PROFORMA

IP NO :  
 DATE OF ADMISSION:  
 AGE :  
 SEX :

## Clinical parameters at the time of admission

Symptom	YES	NO
Cough		
Fever		
Myalgia		
Breathlessness		
Loss of smell		
Any other symptom		

## Oxygenation parameters at the time of admission

Admission respiratory rate	
Admission SpO2	
Admission O2 modality	
Admission O2 rate	
Admission PaO2	

## Lab parameters at the time of admission

Date			
D Dimer			
Sr ferritin			
LDH			
IL6			
ILsCRP			

CT Severity score

OUTCOME

Improved and Discharged to home

Deceased

Worsened and went AMA

Required ICU admission	YES	NO
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Days of hospitalization		
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Days of hospitalization

SpO2 at the time of discharge

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Requirement of O2 support at the time of discharge

--	--

Requirement of O2 support at the time of discharge	
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Sl. No.	Age	AgeGroup	Sex	Symptoms (C=Cough; F=Fever; B=breathlessness; M=Myalgia, Loss of smell=L5; Loss of taste=L7)	Cough	Fever	Breathlessness	Myalgia	Loss of smell	Loss of taste	Asymptomatic	Co-morbidities	DM	HTN	Asthama	IHD	Anemia	ALD	AKI	CKD	CLD	Hypothyroid	Parkinsons disease	Admission SPO2	Mode of O2 (RBM,HFO,NIV, Ventilator) 1	Severity	Severity COVID	Ferritin	LDH	HsCRP	IL-6	d-Dimer	Outcome
1	49	40-59	Male	C,F	Yes	Yes	No	No	No	No	No	ASTHMA	No	No	Yes	No	No	No	No	No	No	No	No	85	HFO	severe	severe	651	573	18.8	7.74	5000	Survived
2	74	60-79	Male	CFMB	Yes	Yes	Yes	Yes	No	No	No	BPH	No	No	No	No	No	No	No	No	No	No	No	91	5 lit	moderate	Non severe	267	240	26.8	31.6	938	Survived
3	48	40-59	Female	FB	No	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	44.6	232	13.7	26.02	562	Survived
4	78	60-79	Male		No	No	No	No	No	No	Yes		No	No	No	No	No	No	No	No	No	No	No	84	NIV	severe	severe	1115	792	57	32.8	356	Survived
5	72	60-79	Male	FB	No	Yes	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	No	99	RA	Mild	Non severe	316.4	464	5.4	10.6	168	Survived
6	55	40-59	Male	CFB	Yes	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	606	332	18.6	12.8	368	Survived
7	52	40-59	Male	CFB	Yes	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	91	6 LIT	Moderate	Non severe	917	353	86.4	73.3	346	Survived
8	60	60-79	Male	CF	Yes	Yes	No	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	56.86	244	45	3.79	363	Survived
9	50	40-59	Male	F	No	Yes	No	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	358	289	54.6	4.54	248	Survived
10	43	40-59	Male	FM	No	Yes	No	Yes	No	No	No		No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	370	433	16.4	20.49	354	Survived
11	75	60-79	Male	C	Yes	No	No	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	97	RA	Mild	Non severe	390	329.6	46.6	1.56	182	Survived
12	59	40-59	Male	CFB	Yes	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	137	1012	36.6	11.32	5000	Survived
13	64	60-79	Male		No	No	No	No	No	No	Yes		No	No	No	No	No	No	No	No	No	No	No	93	2 LIT	Moderate	Non severe	133	196	36.4	1.6	120	Survived
14	44	40-59	Female	Fever	No	Yes	No	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	306	404	91.2	105	448	Survived
15	71	60-79	Female	Cough,breathlessness	Yes	No	Yes	No	No	No	No	IHD	No	No	No	Yes	No	No	No	No	No	No	No	90	3 LIT	Moderate	Non severe	608.1	338	86.6	68.6	338	Survived
16	59	40-59	Male	Cough,fever,breathlessness	Yes	Yes	Yes	No	No	No	No	DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	No	93	2 LIT	Moderate	Non severe	542	674	128	72	1532	Survived
17	52	40-59	Male	Breathlessness	No	No	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	No	90	5 LIT	Moderate	Non severe	210.7	660	11.5	33.51	5000	Survived
18	64	60-79	Male	Cough,fever,breathlessness	Yes	Yes	Yes	No	No	No	No	DM,HTN,CKD	Yes	Yes	No	No	No	No	No	Yes	No	No	No	98	RA	Mild	Non severe	2000	433	54.4	218	775	Survived
19	60	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	No	85	6 LIT	severe	severe	264	230	38.6	46.19	282	Survived
20	65	60-79	Male	C, F	Yes	Yes	No	No	No	No	No	DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	No	92	4 LIT	Mild	Non severe	429	283	86.8	32.45	746	Survived
21	85	>80	Male	F	No	Yes	No	No	No	No	No	DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	61.46	251	1.3	2.4	661	Survived
22	60	60-79	Female	F	No	Yes	No	No	No	No	No	Epilepsy	No	No	No	No	No	No	No	No	No	No	No	91	5 LIT	Moderate	Non severe	22.4	397	5.6	49.8	472	Survived
23	20	20-39	Male		No	No	No	No	No	No	Yes		No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	260	309	40.6	36.2	540	Survived
24	78	60-79	Male	C, B	Yes	No	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	No	92	2 LIT	Moderate	Non severe	510	509	84	257	620	Survived
25	82	>80	Male	B	No	No	Yes	No	No	No	No	DM, HTN, IHD	Yes	Yes	No	Yes	No	No	No	No	No	No	No	92	5 LIT	Moderate	Non severe	192.8	368	1.8	40	864	Survived
26	70	60-79	Male	C, B	Yes	No	Yes	No	No	No	No	DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	349	259	21.8	19.56	276	Survived
27	26	20-39	Female	C, B, M	Yes	No	Yes	Yes	Yes	No	No		No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	151.9	168	0.4	15.2	140	Survived
28	72	60-79	Female	F, B	No	Yes	Yes	No	No	No	No	DM, HTN, Parkinsonism	Yes	Yes	No	No	No	No	No	No	No	No	Yes	90	10 LIT	Moderate	Non severe	532	504	90.2	68.4	1451	Survived
29	23	20-39	Female		No	No	No	No	No	No	Yes	34 weeks gestation	No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	428	245	165	310	794	Survived
30	54	40-59	Male	C, F, B	Yes	Yes	Yes	No	No	No	No	HTN	No	Yes	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	125	456	85.6	136.6	386	Survived
31	60	60-79	Male	C, F	Yes	Yes	No	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	92	6 LIT	Moderate	Non severe	1152	573	42.9	40.27	5000	Survived
32	39	20-39	Male	F, B	No	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	2000	415	58.8	52.8	437	Survived
33	56	40-59	Male	B	No	No	Yes	No	No	No	No	COPD	No	No	No	No	No	No	No	No	No	No	No	92	8 LIT	Moderate	Non severe	264	397	207	1.54	1519	Survived
34	33	20-39	Female	C, F, B	Yes	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	260.4	254	18.8	35.87	427	Survived
35	59	40-59	Male	M, B	No	No	Yes	Yes	No	No	No	HTN	No	Yes	No	No	No	No	No	No	No	No	No	97	RA	Mild	Non severe	359	515	16	225	605	Survived
36	70	60-79	Male	F, B	No	Yes	Yes	No	No	No	No	DM, HTN, IHD	Yes	Yes	No	Yes	No	No	No	No	No	No	No	100	RA	Mild	Non severe	640.1	457	26.8	6.77	1617	Survived
37	30	20-39	Male	C,B	Yes	No	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	7.09	207	16.8	1.15	162	Survived
38	70	60-79	Male	F	No	Yes	No	No	No	No	No	DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	No	99	RA	Mild	Non severe	308	266	92.6	316.5	412	Survived
39	70	60-79	Male	C,B	Yes	No	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	2000	606	38.8	22.6	984	Survived
40	75	60-79	Male	Fever	No	Yes	No	No	No	No	No	DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	107.8	269	134	360	5000	Survived
41	58	40-59	Female	Myalgia	No	No	No	Yes	No	No	No	k/c/o CA breast	No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	432.8	301	80.6	32.74	260	Survived
42	36	20-39	Female	F	No	Yes	No	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	230	339	14.8	1.5	996	Survived
43	32	20-39	Male		No	No	No	No	No	No	Yes		No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	167	268	20.6	13.8	102	Survived
44	67	60-79	Male	C,M, B	Yes	No	Yes	Yes	No	No	No	DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	80	358	20.6	13.8	996	Survived
45	25	20-39	Male	C, F	Yes	Yes	No	No	No	No	No	CLD	No	No	No	No	No	No	No	No	Yes	No	No	96	RA	Mild	Non severe	245	358	40.2	32.1	332	Survived
46	45	40-59	Male	C, B	Yes	No	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	92	5 LIT	Moderate	Non severe	323.7	419	34.5	16.73	478	Survived
47	49	40-59	Male	C, B	Yes	No	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	No	99	RA	Mild	Non severe	80	358	14.8	6.04	996	Survived
48	62	60-79	Male	F, B	No	Yes	Yes	No	No	No	No	HTN	No	Yes	No	No	No	No	No	No	No	No	No	92	10 LIT	Moderate	Non severe	305.3	568	69.9	62.15	534	Survived
49	28	20-39	Male	B	No	No	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	99	RA	Mild	Non severe	160	222	1.4	2.18	228	Survived
50	30	20-39	Male		No	No	No	No	No	No	Yes		No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	278	210	20.8	28.2	260	Survived
51	36	20-39	Male	C, B, F, LOSS OF TASTE,	Yes	Yes	Yes	No	Yes	No	No		No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	594.3	349	28.6	15	242	Survived
52	22	20-39	Female	F, M	No	Yes	No	Yes	No	No	No		No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	40	226	120.4	12.8	390	Survived
53	23	20-39	Male		No	No	No	No	No	No	Yes		No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	21.2	259	28.4	12.8	390	Survived
54	57	40-59	Male	F, B	No	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	97	RA	Mild	Non severe	454.4	396	68.8	74.2	388	Survived
55	35	20-39	Male	C, F, B	Yes	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	No	97	RA	Mild	Non severe	573	390	40.9	38.8	412	Survived
56	70	60-79	Male	F, M	No	Yes	No	Yes	No																								

85	50	40-59	Male		No	No	No	No	No	No	Yes		No	No	No	No	No	No	No	No	No	No	No	97	RA	Mild	Non severe	104.5	179	18.6	14.8	142	Survived
86	26	20-39	Male	C,M,B	Yes	No	Yes	Yes	No	No	No		No	No	No	No	No	No	No	No	No	No	No	99	RA	Mild	Non severe	142	192	1.8	21.4	188	Survived
87	47	40-59	Male	C,F,B	Yes	Yes	Yes	Yes	No	No	No		No	No	No	No	No	No	No	No	No	No	No	90	6 LIT	Moderate	Non severe	239.4	430	152.4	112.2	231	Survived
88	67	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		IHD	No	No	No	Yes	No	No	No	No	No	No	92	RBM	Moderate	Non severe	297	289	88.4	160.4	957	Survived
89	91	>80	Male	C,F	Yes	Yes	No	No	No	No	No		DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	352	280	92.6	149	842	Survived
90	56	40-59	Male	F	No	Yes	No	No	No	No	No		DM,HTN,IHD	Yes	Yes	No	Yes	No	No	No	No	No	No	94	2 LIT	Mild	Non severe	214.6	458	96.6	10	614	Survived
91	56	40-59	Male	C,M,F	Yes	Yes	No	Yes	No	No	No		DM	Yes	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	425	312	36.4	54	276	Survived
92	82	>80	Male	C,B	Yes	No	Yes	No	No	No	No		DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	257	291	116.6	21.8	278	Survived
93	63	60-79	Female	C,M,F	Yes	Yes	No	Yes	No	No	No		DM,IHD	Yes	No	No	Yes	No	No	No	No	No	No	97	RA	Mild	Non severe	124.6	187	46.6	42.67	442	Survived
94	72	60-79	Female	C,F,B	Yes	Yes	Yes	No	No	No	No		DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	80	12 LIT	severe	severe	114	444	49.4	86.29	291	Survived
95	41	40-59	Male	F,B	No	Yes	Yes	Yes	No	No	No		DM	Yes	No	No	No	No	No	No	No	No	No	81	NIV	severe	severe	357	490.5	99.7	124.6	1218	Survived
96	20	20-39	Male	F	No	Yes	No	No	No	No	No			No	No	No	No	No	No	No	No	No	No	93	RA	Mild	Non severe	218.6	344	198.3	56.4	604	Survived
97	38	20-39	Female	F,B	No	Yes	Yes	No	No	No	No		DM	Yes	No	No	No	No	No	No	No	No	No	97	RA	Mild	Non severe	246	345	36.4	1.5	482	Survived
98	54	40-59	Male	F	No	Yes	No	No	No	No	No		DM, IHD, AKI	Yes	No	No	Yes	No	No	Yes	No	No	No	97	RA	Mild	Non severe	376.4	329.8	46.6	20.4	458	Survived
99	85	>80	Female	B	No	No	Yes	No	No	No	No		HTN,IHD	No	Yes	No	Yes	No	No	No	No	No	No	94	RA	Mild	Non severe	285	327	1.4	3.53	1446	Survived
100	28	20-39	Female	C,M	Yes	No	No	Yes	No	No	No			No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	17.73	200	34.4	63.3	203	Survived
101	75	60-79	Male	F	No	Yes	No	No	No	No	No		TN,IHD, UMBILICAL HE	Yes	Yes	No	Yes	No	No	No	No	No	No	98	RA	Mild	Non severe	246	248	26.6	16.8	402	Survived
102	68	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		HTN,CVA	No	Yes	No	No	No	No	No	No	No	No	90	15 LIT	Moderate	Non severe	113.5	518	121	95.28	887	Survived
103	49	40-59	Male	C,F	Yes	Yes	No	No	No	No	No			No	No	No	No	No	No	No	No	No	No	90	5 LIT	Mild	Non severe	334.4	331	64.5	42.6	992	Survived
104	45	40-59	Male	B	No	No	Yes	No	No	No	No			No	No	No	No	No	No	No	No	No	No	90	NIV	Moderate	Non severe	528.5	398	180.9	889	658	Survived
105	40	40-59	Male	F	No	Yes	No	No	No	No	No			No	No	No	No	No	No	No	No	No	No	91	6 LIT	Moderate	Non severe	420	603	86.4	82.84	385	Survived
106	55	40-59	Male	C,B	Yes	No	Yes	No	No	No	No			No	No	No	No	No	No	No	No	No	No	93	5 LIT	Mild	Non severe	36.83	269	68.4	30.76	324	Survived
107	15	<20	Male	C,F	Yes	Yes	No	No	No	No	No			No	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	59.1	264	63.5	15.4	246	Survived
108	54	40-59	Male	M,B	No	No	Yes	Yes	No	No	No		DM	Yes	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	245	156.4	16.5	10.2	186	Survived
109	67	60-79	Female	B	No	No	Yes	No	No	No	No		DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	897.7	461	8.2	5.31	2464	Survived
110	73	60-79	Male	F,B	No	Yes	Yes	No	No	No	No		DM	Yes	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	248.4	1656	16.8	14.6	3402	Survived
111	50	40-59	Male	F	No	Yes	No	No	No	No	No		IHD	No	No	No	Yes	No	No	No	No	No	No	98	RA	Mild	Non severe	165	50.6	0.6	20.4	145	Survived
112	49	40-59	Male	C,F,B	Yes	Yes	Yes	No	No	No	No			No	No	No	No	No	No	No	No	No	No	99	RA	Mild	Non severe	264	156	26.4	1.5	365	Survived
113	86	>80	Male	C,F,M	Yes	Yes	No	Yes	No	No	No			No	No	No	No	No	No	No	No	No	No	94	3 LIT	Mild	Non severe	65	321	12.5	253	486	Survived
114	69	60-79	Male	F,B	No	Yes	Yes	No	No	No	No		DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	90	5 LIT	Moderate	Non severe	365	804	311	2162	474	Survived
115	17	<20	Female	F	No	Yes	No	No	No	No	No			No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	42.47	197	68.4	19.4	127	Survived
116	36	20-39	Male	F,B	No	Yes	Yes	No	No	No	No			No	No	No	No	No	No	No	No	No	No	90	6 LIT	Moderate	Non severe	1008	464	36.4	49.73	622	Survived
117	51	40-59	Male	C,F	Yes	Yes	No	No	No	No	No		HTN	No	Yes	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	514	257	41.7	37.2	206	Survived
118	18	<20	Male	C,B	Yes	No	Yes	No	No	No	No			No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	122.5	216	15.6	8.6	218	Survived
119	29	20-39	Male	C,F	Yes	Yes	No	No	No	No	No			No	No	No	No	No	No	No	No	No	No	97	RA	Mild	Non severe	95.9	38	12.5	1.6	475	Survived
120	45	40-59	Female	C	Yes	No	No	No	No	No	No			No	No	No	No	No	No	No	No	No	No	97	RA	Mild	Non severe	26.7	391	125	250	450	Survived
121	43	40-59	Male	F,B	No	Yes	Yes	No	No	No	No			No	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	163	728	45.4	16.4	886	Survived
122	57	40-59	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	90	10 LIT	Moderate	Non severe	532.3	145.5	90	35.5	450	Survived
123	80	>80	Male	C,F,B	Yes	Yes	Yes	No	No	No	No			No	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	55.25	296	16.8	14.7	16.5	Survived
124	61	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		DM	Yes	No	No	No	No	No	No	No	No	No	95	5 LIT	Mild	Non severe	162.4	484	45.4	171	5000	Survived
125	80	>80	Male	C,F,M	Yes	Yes	No	Yes	No	No	No		DM	Yes	No	No	No	No	No	No	No	No	No	94	4 LIT	Mild	Non severe	98.57	165	7.01	9.09	230	Survived
126	51	40-59	Male	M,B	No	No	Yes	Yes	No	No	No		DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	90	6 LIT	Moderate	Non severe	142	444	86.6	10.87	788	Survived
127	52	40-59	Male	B	No	No	Yes	No	No	No	No		DM	Yes	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	168	190	1.5	2.4	324	Survived
128	85	>80	Male	F	No	Yes	No	No	No	No	No		HTN	No	Yes	No	No	No	No	No	No	No	No	95	4 LIT	Mild	Non severe	94.87	694	16.4	42.3	1179	Survived
129	63	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		DM	Yes	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	190.3	198	2.4	10.11	84	Survived
130	28	20-39	Female	C,F	Yes	Yes	No	No	No	No	No			No	No	No	No	No	No	No	No	No	No	99	RA	Mild	Non severe	163	286	6.8	15.3	340	Survived
131	28	20-39	Male	F	No	Yes	No	No	No	No	No			No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	180	126	16.5	6.4	240	Survived
132	45	40-59	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		BRONCHIAL ASTHMA	No	No	Yes	No	No	No	No	No	No	No	95	2 LIT	Mild	Non severe	390	242	52.7	12.5	605	Survived
133	45	40-59	Male	C	Yes	No	No	No	No	No	No		HTN	No	Yes	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	268	294	15.5	10.6	368	Survived
134	55	40-59	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	74.7	250	24.4	45	303	Survived
135	59	40-59	Male	C,F	Yes	Yes	No	No	No	No	No			No	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	64.59	115	46.4	1.68	604	Survived
136	37	20-39	Male	F,M	No	Yes	No	Yes	No	No	No			No	No	No	No	No	No	No	No	No	No	95	4 LIT	Mild	Non severe	158.6	242	26.4	1.5	268	Survived
137	67	60-79	Male	F,B	No	Yes	Yes	No	No	No	No		DM, HTN, IHD	Yes	Yes	No	Yes	No	No	No	No	No	No	97	RA	Mild	Non severe	43.13	214	36.4	3.77	162	Survived
138	25	20-39	Female	C,F,B	Yes	Yes	Yes	No	No	No	No			No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	80	358	452	6.04	996	Survived
139	25	20-39	Female	C,F	Yes	Yes	No	No	No	No	No			No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	104	358	15.6	6.04	996	Survived
140	26	20-39	Female	C,F,B	Yes	Yes	Yes	No	No	No	No			No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	80	358	12.4	6.04	996	Survived
141	54	40-59	Female	B	No	No	Yes	No	No	No	No			No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	683.5	331	15.4	1.5	273	Survived	
142	4																																

176	29	20-39	Female	CF	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	395	160	56.6	5.98	980	Survived
177	45	40-59	Male	CFB	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	86	5 lit	severe	severe	210.5	450	15.3	11.25	386	Survived
178	42	40-59	Male	CB	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	93	RA	Mild	Non severe	554	411	90.6	121	399	Survived
179	42	40-59	Male	F	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	68.11	189	56.4	9.62	179	Survived
180	38	20-39	Female	B	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	97	2 LIT	Mild	Non severe	246	345	16.4	1.5	482	Survived
181	54	40-59	Male	CF	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	356	375	90.6	132.7	607	Survived
182	40	40-59	Male	CFB	Yes	Yes	Yes	No	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	89	5 LIT	severe	severe	1918	390	201	390	5000	Survived	
183	50	40-59	Male	F	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	357	227	45.6	3.17	394	Survived	
184	65	60-79	Male	CB	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	96	5 LIT	Mild	Non severe	122	257	12.3	4.6	730	Survived
185	60	60-79	Male	C	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	306	258	16.4	19.25	650	Survived
186	50	40-59	Male	CF	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	168	576	107.4	60.36	900	Survived
187	43	40-59	Male	CBM	Yes	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	90	RA	moderate	Non severe	456	365	46.4	24.28	296	Survived
188	71	60-79	Male	CF	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	88	HFO 20L	severe	severe	129	206	2.1	47.5	387	Survived	
189	40	40-59	Male	FBM	No	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	154	247	11.3	90.5	125	Survived
190	34	20-39	Male	M	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	260	247	123	8.45	166	Survived
191	35	20-39	Male	FB	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	87	10 LIT	severe	severe	1608	625	120.6	14.6	471	Survived
192	50	40-59	Male	FB	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	604	240	90.4	16.4	295	Survived
193	56	40-59	Male	CFB	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	56	NIV	severe	severe	1128	965	126.4	6.61	2450	Survived
194	74	60-79	Male	CF	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	184	258	35.1	49.52	164	Survived
195	62	60-79	Male	CB	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	88	6 LIT	severe	severe	465.5	368.5	13.5	46	1205	Survived
196	69	60-79	Male	B	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	90	CPAP	Moderate	Non severe	345.8	78.4	78.4	17.2	1206	Survived	
197	65	60-79	Male	CF	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	97	RA	Mild	Non severe	188.8	169	1.7	10.4	1254	Survived	
198	48	40-59	Female	CF	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	364	356	16.4	64.2	109	Survived	
199	72	60-79	Male	CB	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	1182	381	36.4	46.8	260	Survived	
200	31	20-39	Female	CF	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	91	RA	Mild	Non severe	233	135	52.4	4.17	138	Survived	
201	58	40-59	Male	CB	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	95	3 LIT	Mild	Non severe	911.6	716	24.4	64.65	483	Survived	
202	75	60-79	Male	CFB	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	240	642	12.5	237.8	3305	Survived	
203	45	40-59	Male	CM	Yes	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	95	RA	Mild	Non severe	131.2	270	80.6	11.69	276	Survived	
204	65	60-79	Male	FB	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	93	RA	Mild	Non severe	2647	653	126.4	201.8	692	Survived	
205	59	40-59	Male	F	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	94	RA	Mild	Non severe	1544.4	484	135.6	102.4	326	Survived	
206	20	20-39	Male	CB	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	95	RBM	Moderate	Non severe	1023	2120	160	5.2	5000	Survived	
207	60	60-79	Male	CFB	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	473.2	726	102.5	26.26	5000	Survived	
208	56	40-59	Female	CMB	Yes	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	93	2 LIT	Mild	Non severe	263	406	90.4	84.45	333	Survived	
209	65	60-79	Male	CF	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	90	5 LIT	Mild	Non severe	199.1	150	36.8	29.25	357	Survived	
210	55	40-59	Female	MFB	No	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	93	RA	Mild	Non severe	650.2	200	60.4	4.72	111	Survived	
211	61	60-79	Male	CB	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	74	5 LIT	severe	severe	36.24	300	46	5.55	387	Survived	
212	64	60-79	Male	B	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	92	2 LIT	Mild	Non severe	155.8	316	90.4	69.42	193	Survived	
213	51	40-59	Male	CB	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	92	HFO	Moderate	Non severe	214	230	164	11.99	455	Survived	
214	61	60-79	Female	C	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	96	RA	Mild	Non severe	15.56	314	14.6	1.86	120	Survived	
215	61	60-79	Male	CB	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	94	2 LIT	Mild	Non severe	860	820	46.8	19	400	Survived	
216	60	60-79	Female	CB	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	93	2 LIT	Mild	Non severe	85.2	160	33.4	9.95	475	Survived	
217	45	40-59	Male	CB	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	90	6 LIT	Moderate	Non severe	31.24	400	102.4	25.86	301	Survived	
218	66	60-79	Male	CF	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	90	RBM	Moderate	Non severe	667	250	140.5	518	1267	Survived	
219	58	40-59	Female	B	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	99	RA	Mild	Non severe	888.6	450	90.4	5.19	303	Survived	
220	56	40-59	Female	MB	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	89	NIV	Moderate	Non severe	327.6	350	65.6	10.1	759	Survived	
221	52	40-59	Male	CFB	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	93	RA	Mild	Non severe	203	286	23	1.5	950	Survived	
222	75	60-79	Male	MFB	No	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	88	5 LIT	severe	severe	216.4	255	50.7	59.7	1290	Survived	
223	59	40-59	Male	FM	No	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	90	7 LIT	Moderate	Non severe	186.5	425	98.6	10	1093	Survived	
224	68	60-79	Male	CFM	Yes	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	87	5 LIT	severe	Non severe	1051	260	227.3	63.08	629	Survived	
225	70	60-79	Male	CF	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	93	RA	Mild	Non severe	102	233	173.2	119.2	1495	Survived	
226	45	40-59	Female	CFB	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	88	HFO	severe	Non severe	2059	6.6	60	10.1	434	Survived	
227	65	60-79	Male	CF	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	87	HFO	severe	Non severe	1087	280	183	33.05	136	Survived	
228	52	40-59	Male	CFB	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	98	RA	Mild	Non severe	222	236	20	33.5	289	Survived	
229	55	40-59	Female	FB	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	97	4L	Mild	Non severe	243	494	3.33	243	247	Survived	
230	72	60-79	Female	FB	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	35	NIV	severe	severe	800	591	49	181.5	2460	Survived	
231	58	40-59	Male	CMF	Yes	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	96	5 LIT	Mild	Non severe	2647	188	2.4	5.83	175	Survived	
232	75	60-79	Female	C	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	86	15 LIT	severe	Non severe	783	210	125	152	180	Survived	
233	45	40-59	Male	C	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	95	2 LIT	Mild	Non severe	365	302	60.4	12.4	360	Survived		
23																																	





449	71	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	DM,HTN,	Yes	Yes	No	No	No	No	No	No	No	No	88	RBM	Severe	Severe	344	296	88.5	32.18	290	Death
450	83	>80	Male	F,B	No	Yes	Yes	No	No	No	No	IHD	No	No	No	Yes	No	No	No	No	No	No	66	NIV	Severe	Severe	1186	600	93	15.6	1043	Death
451	67	60-79	Male	C,B,M	Yes	No	Yes	Yes	No	No	No	HTN	No	Yes	No	No	No	No	No	No	No	No	88	RBM	Severe	Severe	269	514	82	46.8	1320	Death
452	73	60-79	Female	C,F,B	Yes	Yes	Yes	No	No	No	No	DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	87	RBM	Severe	Severe	802	394	80.2	80.2	360	Death
453	72	60-79	Male	F,B	No	Yes	Yes	No	No	No	No	DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	84	RBM	Severe	Severe	3669	371	140	70	419	Death
454	60	60-79	Male	C, F, B	Yes	Yes	Yes	No	No	No	No	ASTHMA	No	No	Yes	No	No	No	No	No	No	No	82	RBM	Severe	Severe	1013	969	256	946	1352	Death
455	70	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	64	10 lit	Severe	Severe	1434	709	169	8.48	644	Death
456	50	40-59	Male	C,B,	Yes	No	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	83	O2M	Severe	Severe	308	933	649.8	347.1	1392	Death
457	51	40-59	Male		No	No	No	No	No	No	Yes	DM,AKI	Yes	No	No	No	No	No	Yes	No	No	No	84	RBM	Severe	Severe	2318	476	196	113	1349	Death
458	63	60-79	Male	C,F,M,B	Yes	Yes	Yes	Yes	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	65	NIV	Severe	Severe	413	750	112	26.6	1482	Death
459	68	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	87	RBM	Severe	Severe	737	451	208.8	97.51	5000	Death
460	49	40-59	Male	F,M	No	Yes	No	Yes	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	86	RBM	Severe	Severe	1349	826	92.3	24.4	937	Death
461	74	60-79	Male	B	No	No	Yes	No	No	No	No	DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	79	NIV	Severe	Severe	499	3650	108	176	5000	Death
462	73	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	76	RBM	Severe	Severe	1791	502	46	18.8	273	Death
463	66	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	96	RA	mild	non severe	847.6	414	146	222	573	Death
464	52	40-59	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	HTN	No	Yes	No	No	No	No	No	No	No	No	66	RBM	Severe	Severe	516.7	819	218.6	22.65	1217	Death
465	56	40-59	Male	M	No	No	No	Yes	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	84	RBM	Severe	Severe	923	842	80.2	30.6	765	Death
466	71	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	IHD	No	No	No	Yes	No	No	No	No	No	No	73	NIV	Severe	Severe	271	854	14	19.57	660	Death
467	66	60-79	Female	C,F,B	Yes	Yes	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	94	RA	mild non severe	Severe	82.91	280	36.6	164	328	Death
468	84	>80	Male	B	No	No	Yes	No	No	No	No	DM,HTN,IHD	Yes	Yes	No	Yes	No	No	No	No	No	No	96	RA	LD NON SEVI	Severe	385.3	489	38.4	208	898	Death
469	64	60-79	Male	C,B	Yes	No	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	94	NIV	Severe	Severe	1507	680	76.4	170	7028	Death
470	32	20-39	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	86	RBM	Severe	Severe	759	579	50.4	54.4	1365	Death
471	65	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	56	NIV	Severe	Severe	2000	670	130	768	346	Death
472	36	20-39	Male	M,B	No	No	Yes	Yes	No	No	No	Hypothyroid	No	No	No	No	No	No	No	No	No	Yes	62	RBM	Severe	Severe	1910	1449	174.8	20	3650	Death
473	68	60-79	Male	F,B	No	Yes	Yes	No	No	No	No	HTN,DM	Yes	Yes	No	No	No	No	No	No	No	No	82	RBM	Severe	Severe	632.4	732	90.6	25.3	1535	Death
474	56	40-59	Male	B,M	No	No	Yes	Yes	No	No	No	DM,HTN,IHD	Yes	Yes	No	Yes	No	No	No	No	No	No	90	RBM	Severe	Severe	229	243	162.8	102.8	187	Death
475	77	60-79	Male	C,F,M,B,LT	Yes	Yes	Yes	Yes	Yes	No	No		No	No	No	No	No	No	No	No	No	No	72	D2 MASK	Severe	Severe	1015	518	119.6	157.8	431	Death
476	65	60-79	Female	C,B	Yes	No	Yes	No	No	No	No	DM, HTN	Yes	Yes	No	No	No	No	No	No	No	No	77	RBM	Severe	Severe	432	629	120.8	87.6	1528	Death
477	69	60-79	Male	C,B	Yes	No	Yes	No	No	No	No	DM,HTN,CKD	Yes	Yes	No	No	No	No	No	Yes	No	No	83	RA	Severe	Severe	904	415	76.6	145.5	509	Death
478	68	60-79	Male		No	No	No	No	No	No	Yes		No	No	No	No	No	No	No	No	No	No	86	RBM	Severe	Severe	2000	855	316.5	195.2	5000	Death
479	61	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	82	RA	Severe	Severe	1341	416	86.6	43.3	350	Death
480	50	40-59	Male	C,B	Yes	No	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	83	RBM	Severe	Severe	505	503	186.6	175	770	Death
481	58	40-59	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	68	NIV	Severe	Severe	529	683	166.6	184.6	1327	Death
482	57	40-59	Male	C,M,B	Yes	No	Yes	Yes	No	No	No	IHD	No	No	No	Yes	No	No	No	No	No	No	86	RBM	Severe	Severe	1133	538	250	8.69	642	Death
483	84	>80	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	HTN	No	Yes	No	No	No	No	No	No	No	No	88	NIV	Severe	Severe	567	885	299	160.4	1580	Death
484	52	40-59	Male	C,B	Yes	No	Yes	No	No	No	No	HTN,TB	No	Yes	No	No	No	No	No	No	No	No	82	NIV	Severe	Severe	317	820	281	168.6	7500	Death
485	81	>80	Male	F,B	No	Yes	Yes	No	No	No	No	HTN	No	Yes	No	No	No	No	No	No	No	No	52	RBM	Severe	Severe	320.6	828	256.4	127.5	1245	Death
486	75	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	DM,HTN,IHD	Yes	Yes	No	Yes	No	No	No	No	No	No	87	RBM	Severe	Severe	2924	686	266	23.18	1456	Death
487	60	60-79	Female	C,B	Yes	No	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	80	RBM	Severe	Severe	256	1035	160.6	42.9	1516	Death
488	90	>80	Male	B	No	No	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	95	RA	Severe	Severe	1290	971	188.8	88.8	5000	Death
489	60	60-79	Male	F,B	No	Yes	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	31	NIV	Severe	Severe	615	613	143.6	110	1193	Death
490	38	20-39	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	90	NIV	Severe	Severe	347	1089	282	193.6	1258	Death
491	55	40-59	Female	B	No	Yes	Yes	No	No	No	No	HYPOTHYROID	No	No	No	No	No	No	No	No	Yes	No	83	O2M	Severe	Severe	450	653	136.6	42	666	Death
492	50	40-59	Male	F,B	No	No	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	70	RBM	Severe	Severe	3037	140	212.6	144.6	2360	Death
493	75	60-79	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	85	RBM	Severe	Severe	810	765	208.9	456.6	5000	Death
494	62	60-79	Male	C,M,F,B	Yes	Yes	Yes	Yes	No	No	No	DM,HTN,IHD,CKD	Yes	Yes	No	Yes	No	No	No	Yes	No	No	62	HFNO	Severe	Severe	322	634	59.3	1.5	1509	Death
495	49	40-59	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	86	RBM	Severe	Severe	758.9	576	301.8	72.29	5000	Death
496	81	>80	Male	M,F,B	No	Yes	Yes	Yes	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	77	RBM	Severe	Severe	513	476	78.8	80.4	1653	Death
497	77	60-79	Male	M,B	No	No	Yes	Yes	No	No	No	DM, IHD	Yes	No	No	Yes	No	No	No	No	No	No	84	RBM	Severe	Severe	387	410	122.6	62.9	999	Death
498	54	40-59	Male	B	No	No	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	77	RBM	Severe	Severe	325	482	122	114	1608	Death
499	85	>80	Male	B	No	No	Yes	No	No	No	No	DM,HTN,IHD,Asthma	Yes	Yes	Yes	Yes	No	No	No	No	No	No	96	RA	LD NON SEVI	non severe	1576	581	56.1	187.7	635	Death
500	80	>80	Male	B	No	No	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	85	RBM	Severe	Severe	326	733	14.2	1.52	5000	Death
501	80	>80	Female	C,B	Yes	No	Yes	No	No	No	No	DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	72	RBM	Severe	Severe	161	417	772	72.89	655	Death
502	58	40-59	Male	C,F,B	Yes	Yes	Yes	No	No	No	No	DM	Yes	No	No	No	No	No	No	No	No	No	85	RBM	Severe	Severe	2254	869	136.5	161.5	1237	Death
503	50	40-59	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		No	No	No	No	No	No	No	No	No	No	50	RBM	Severe	Severe	624.5	645.6	157.2	36.5	791	Death
504	53	40-59	Male	C,B	Yes	No	Yes	No	No	No	No	DM,Hypothyroidism	Yes	No	No	No	No	No	No	Yes	No	No	86	RBM	Severe	Severe	448.4	341	99.2	105.9	1541	Death
505	50	40-59	Male	C,B	Yes	No	Yes	No	No	No	No	DM,HTN	Yes	Yes	No	No	No	No	No	No	No	No	86	RBM	Severe	Severe	134.1	325.6	366.9	305.6	646	Death
506	53	40-59	Male	C,F,B	Yes	Yes	Yes	No	No	No	No		No	No	No</																	