"TO STUDY THE CORRELATION OF FERRITIN/TRANSFERRIN RATIO WITH THE SEVERITY OF COVID-19 INFECTION – A ONE YEAR CROSS SECTIONAL STUDY DONE IN KLES DR. PRABHAKAR KORE HOSPITAL AND MEDICAL RESEARCH CENTRE, BELAGAVI."

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Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"TO STUDY THE CORRELATION OF FERRITIN/TRANSFERRIN RATION WITH THE SEVERITY OF COVID-19 – A ONE YEAR CROSS SECTIONAL STUDY DONE IN KLES DR. PRABHAKAR KORE HOSPITAL AND MEDICAL RESEARCH CENTRE. BELAGAVI",** is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

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ABSTRACT

Background: The incidence of infections caused due to Severe Acute Respiratory Syndrome-Related coronavirus 2 (SARS-CoV-2) was responsible for causing a worldwide pandemic, this disease which is also known as COVID-19 ended up affecting millions of people. The present study aims to understand the correlation of Ferritin/Transferrin ratio with COVID-19 infection and to assess its predictive value on the severity of the disease.

Materials & Method: This hospital based cross-sectional study was conducted among the patients admitted in the COVID 19 dedicated wards of KLES Dr PRABHAKAR KORE HOSPITAL, BELGAUM and those fulfilling the inclusion criteria of the study were included. Amongst them the blood biomarkers, Ferritin/Transferrin ratio and mortality was assessed and correlated with COVID-19 infection outcome among the patients.

Results: In the present study, a total of 168 patients with COVID-19 were evaluated. In this study, the mean age of patients was found to be 57.35 ± 16.59 years. Also, 84% were male patients and 16% were female patients with male preponderance. There is a significantly higher Ferritin upon Transferrin ratio among the patients with mortality as compared to the patients which survived. The area under the curve (0.885) for the Ferritin/Transferrin ratio was significantly positively related with the prediction of the mortality among the patients with the odds of death increasing by 2.24 (95% CI: 1.77 - 2.99) with the unit increase of Ferritin/Transferrin ratio.

Conclusion: The present study documented the significant correlation of Ferritin/Transferrin ratio with COVID-19 infection and also a higher incidence of mortality among the patients with higher Ferritin, low Transferrin and a significantly higher Ferritin/Transferrin ratio.

Keyword: COVID-19, Mortality, Survived, Ferritin, Ferritin/Transferrin ratio, Predict.

ABBREVIATIONS

ACE-2	ANGIOTENSIN-CONVERTING ENZYME 2 RECEPTOR
AUC	AREA UNDER CURVE
CoV	CORONAVIRUS
COVID 19	CORONAVIRUS DISEASE 19
CFR	CASE FATALITY RATE
HFO	HIGH FLOW OXYGEN
HIF	HYPOXIA-INDUCIBLE FACTOR
ICU	INTENSIVE CARE UNIT
IRE	IRON-RESPONSIVE ELEMENTS
IRP	IRON REGULATED PROTEIN
INR	INTERNATIONAL NORMALISED RATIO
IL	INTERLEUKIN
LDH	LACTATE DEHYDROGENASE
MERS	MIDDLE EAST RESPIRATORY SYNDROME
NIV	NON INVASIVE VENTILATION
RBM	REBREATHER MASK
RA	ROOM AIR

RBS	RANDOM BLOOD SUGAR
RNA	RIBONUCLEIC ACID
RTPCR	REVERSE TRANSCRIPTION POLYMERASE CHAIN REACTION
RR	RESPIRATORY RATE
SARS	SEVERE ACUTE RESPIRATORY SYNDROME
SGOT	SERUM GLATAMIC OXALOACETATE TRANSAMINASE
SGPT	SERUM GLUTAMIC PYRUVIC TRANSAMINASE
SPO2	OXYGEN SATURATION
TMPRS	TRANSMEMBRANE PROTEASE SERINE
UTR	UNTRANSLATED REGION
WHO	WORLD HEALTH ORGANISATION

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Aim

To study the correlation of Ferritin/Transferrin ratio with COVID-19 infection and to assess its predictive value on the severity of the disease.

Objectives

- To assess the blood biomarkers among the COVID-19 patients
- To assess and correlate the predictive value of Ferritin upon Transferrin ratio with the outcome of COVID-19 patients.

INTRODUCTION

The incidence of infection caused due to Severe Acute Respiratory Syndrome related Coronavirus 2 (SARS-CoV-2) was responsible for causing a worldwide pandemic, this disease which is also known as COVID-19, that is coronavirus disease 2019 ended up affecting millions of people.[1]

Anemia and its associated disturbances in iron regulation homeostasis is very commonly seen in COVID-19 patients and is associated with a significantly higher mortality in hospital.[2] The presence of chronic inflammation in COVID-19 along with alterations in iron homeostasis characteristically leads to increased levels of pro inflammatory marker Ferritin and a decreased amount of Transferrin due to sequestration of iron in hepatocytes, bone marrow and macrophages.

Notably, in one study it was found that a Ferritin upon Transferrin ratio of more than 10 predicted a five times higher risk of ICU admission and an eight times higher risk for the need of mechanical ventilation.[3] This shows that biomarkers for Iron homeostasis can help with risk stratification of patients and alterations in iron regulation with a higher Ferritin/Transferrin ratio could help to predict the severity of COVID-19 infection.

This study can therefore investigate whether Ferritin/Transferrin ratio could help us to differentiate between COVID-19 patients with or without severe disease.

REVIEW OF LITERATURE

The Coronavirus disease has become a serious illness amongst both people and animals.[4] Towards the end of 2019, a newly discovered virus was found to be the cause of several pneumonia cases in Wuhan, a city in China's Hubei province. It spread swiftly, resulting in an epidemic in China and an increasing number of cases in other countries throughout the world.[5] On 5th February 2020, the World Health Organization (WHO) designated the term for this illness as COVID-19, short for Corona-virus disease 2019. Previously known as 2019-nCoV, the virus that causes COVID-19 is now referred to as Severe Acute Respiratory Syndrome Corona-Virus 2 (SARS-CoV-2). The WHO declared COVID-19 a pandemic on March 11, 2020.[6]

Epidemiology

The index case of this disease was reported on 31st December 2019 in the city of Wuhan, Hubei Province, People's republic of China.

Following this, the disease started rapidly spreading to other parts of China followed by its rapid spread internationally. COVID-19 was labelled a Public Health Emergency of International Concern by the World Health Organization on 30 January 2020 and was recognized as a pandemic on 11 March 2020. As of April 23, 2020, it had spread to nearly 185 countries resulting in a global pandemic.

The SARS CoV-2 basic reproduction number (R0) is predicted to be somewhere between 1.40 and 3.90, suggesting its extremely contagious nature. The R0 tends to be higher in public meeting venues such as schools, colleges, cruise ships, academic/business/religious/political congregations and hospitals which are not adequately equipped with personal protective measures such as PPE, gloves, masks

etc. The incubation period for the virus and its serial interval is around 5 to 6 and 8 days, respectively, comparable to both SARS CoV and MERS CoV.[7] The CFR, which stands for Case Fatality Rate was predicted to lie somewhere between 0.90 and 3.0 percent during the initial period of the pandemic, which was lower than that of previously reported Human Coronavirus SARS CoV (6 percent – 17 percent) and the Middle East Respiratory Syndrome CoV (20 percent – 40 percent). The CFR had increased exponentially in many countries by 24th May 2020.

Unlike SARS CoV, a large proportion of people infected with SARS CoV-2 are asymptomatic or pauci symptomatic, allowing them to avoid identification and become potential carriers.[8] It is very important to note that not every close contact would be infected, implying that individual genetic susceptibility plays a key role.[9,10] The virus normally enters humans through the upper aerodigestive tract. SARS CoV-2 was recently also detected from a patient's stool sample raising the possibility of faecal-oral transmission.[11,12]

In pregnant women, Infection with SARS CoV-2 increases the risk of vertical transmission. Vertical transmission was ruled to be less likely due to negative virus testing on swabs recovered from the cord blood, amniotic fluid, neonatal pharynx, and breast milk of six pregnant women infected with SARS Cov-2.[13] The possibility of long range transmission via airborne route is also being studied which depends on the ventilation parameters of the given area and flow related dynamics of virus spread from an infected individual.[14] Furthermore, mapping techniques like as cartograms can be used to depict the dissemination and expansion of COVID-19.[15] Understanding the pathways of transmission of SARS CoV-2 can help us to understand and allow use of appropriate containment measures.

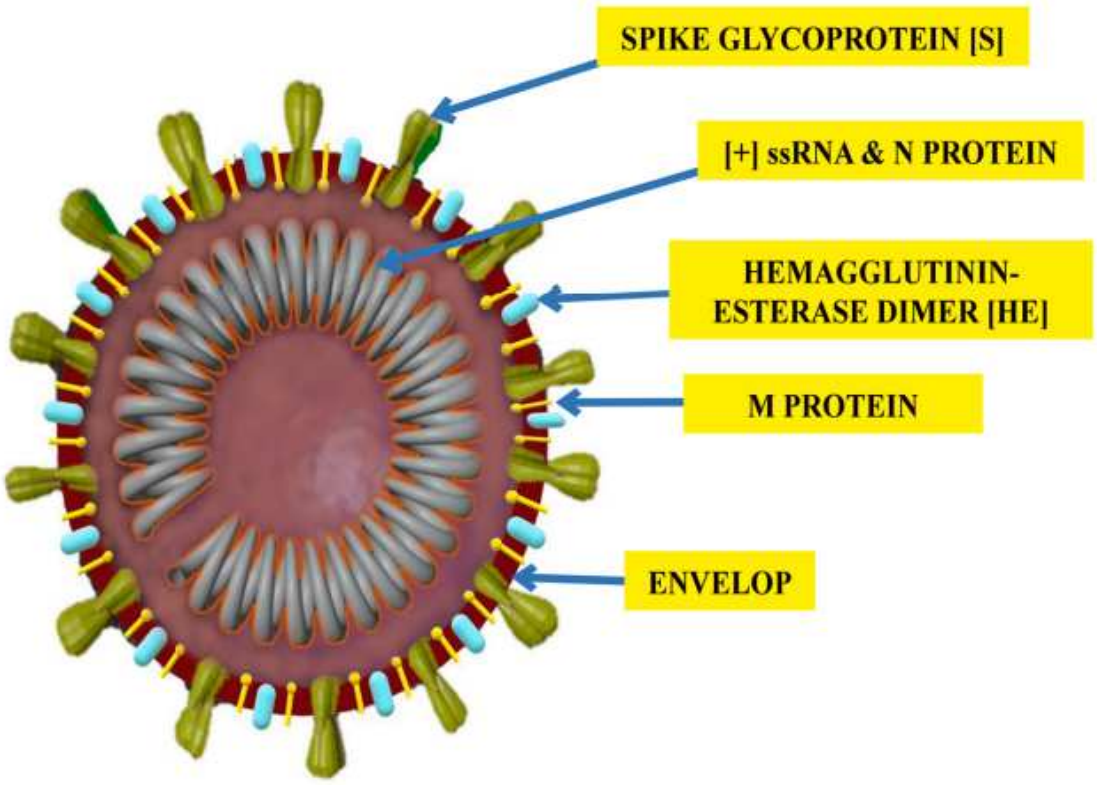

Figure 1: COVID-19 virus structure

Despite the fact that all age groups are susceptible to SARS CoV-2 infection, the severity of the disease and death appears to be lower in children.[16] Women are less typically impacted than males in adulthood due to higher plasma ACE2 levels.[17] The older population, particularly those having co-morbidities like hypertension, stroke diabetes and chronic pulmonary/renal/cardiac disease, are especially prone to very severe infections due to poor immunity against the infection and any underlying age related organ system breakdown.[1,18] A recent study found that, similar to SARS CoV, the incidence of infection and mortality from COVID 19 was higher among non-O blood groups, notably type A blood group, probably because of lack of protective anti A IgM antibodies. There are still many uncertainties present in the epidemiology of

SARS CoV-2, particularly the interaction between the virus and its host, including vulnerability and epidemic evolution.[19,20]

The entire family of Coronavirus is divided into α and β which is seen in mammals including humans and γ and δ which is seen in avian species. Their name is derived from the presence a particular spike protein on their envelope and their uncanny resemblance to crown (*Coronam* in Latin) which is usually appreciated only on electron microscopy. These family of viruses can cause infections in the gastrointestinal, respiratory, central nervous system and hepatic system. Both avian and mammalian species are equally predisposed to be infected by these group of viruses.

It is estimated that roughly 2% of the entire population is a healthy carrier of Coronaviruses, and that these viruses seem to be the causative agent for about 5 to 10 percent of acute respiratory infections. It is postulated that when the transfer of these viruses occur from natural hosts to humans via an intermediate amplifying host, they start undergoing recombination and rapid mutation, which results in the emergence of novel Coronaviruses that can be virulent and cause diseases in humans. In the recent few decades, these group of viruses have produced infections such as Severe Acute Respiratory Syndrome (SARS CoV) in China back in 2002–2003 and the Middle East Respiratory Syndrome (MERS CoV) in Saudi Arabia in 2012, culminating in pandemics with extra-pulmonary and pulmonary manifestations. As a result, Coronaviruses have emerged as significant pathogens in rising respiratory illness outbreaks.

Pathogenesis

Because of the similarities between SARS CoV and SARS CoV-2, SARS CoV-2 enters human cells utilising the S1 fraction of its highly glycosylated spike (S) proteins. This protein also possesses a receptor binding domain (RBD), which binds to the ACE-2 Receptor with 10 to 20 times more affinity than SARS CoV. Primarily present in alveolar epithelial cells, this ACE 2 receptor (more expressed in type II than type I). This receptor is expressed by the endothelium, cardiac myocytes, and gastrointestinal (intestinal and esophageal) epithelium. The SARS CoV-2 exploits its specific S1/S2 protease cleavage site with SPRR insertion on the spike protein to assist the fusing of the virus to the host cell membrane after binding to this receptor. It has been shown that TMPRSSs and ACE-2 R are highly co-expressed in the upper esophageal epithelium, type 2 alveolar pneumocytes and absorptive enterocytes, implying that in addition to alveolar epithelium this virus can also enter the host cell via both the intestinal and esophageal epithelium.[7]

Therefore, the potential SARS CoV-2 target tissues should express both TMPRSSs and ACE-2 Receptor. Viral RNA can internalise into the cytoplasm of the host cell thanks to this membrane fusion, where it is copied and translated to produce new viral proteins. Viral assembly, which occurs just before virions are released from infected cells, entails a nucleocapsid (N) protein binding to RNA molecules, which is then covered by membrane proteins and an envelope to produce full viral particles (virions), which can, as previously discussed, infect a variety of new cells.[7]

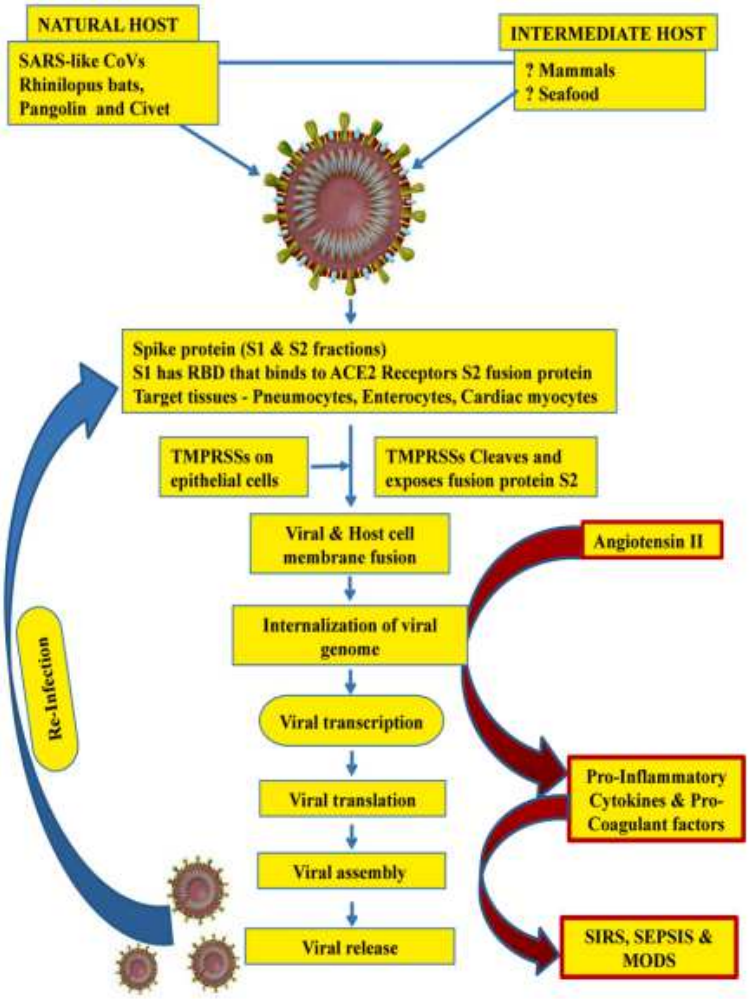

Figure 2: Pathogenesis of COVID-19 infection

Type II pneumocytes which are responsible for surfactant biosynthesis and tissue healing are destroyed after SARS CoV-2 infection, resulting in increased surface tension and dyspnoea. Furthermore, the damage caused to type II pneumocytes impairs the balance between pro-inflammatory and anti-inflammatory alveolar immunologic function by excessively inducing a cascade of both local and systemic inflammatory responses as a result of excessive cytokine production and release, also known as cytokine storm by activated inflammatory cells as a result of angiotensin II accumulation.[7]

Transmission

The secondary attack rate before the emergence of variations among paediatric contacts (less than or equal to 18 years of age) ranged from 4 to 57 percent in the observational studies pertaining to household transmission.[21,26] A meta-analysis comprised of 87 studies on household transmission involving 1,556,198 household connections from various countries found that there was a secondary attack rate of 30% among adult contacts and 18% among paediatric contacts. More transmissible variations improve household transmission rates. A study of familial clusters found that during the dominant circulation of the Alpha (B.1.1.7 lineage) variant, the secondary attack rate was 72 to 75% in children under the age of 18 and up to 90% in adults.[27,28]

Close contact with people infected with COVID-19 (typically a household member), having visitors and attending gatherings with people outside the household (social functions, activities with other children) were all linked to SARS-CoV-2 infection in children and adolescents, according to a case-control study.[29]

There have also been reports of health care associated epidemics and cases of potential transmission from teachers or school employees to kids and among students in the school context.[30,33] In a case-control investigation, irregular mask use at school was linked to SARS-CoV-2 infection, but not school attendance.[29]

Although nothing is known about SARS-CoV-2 transmission by truly asymptomatic (as opposed to pre symptomatic) children, transmission from children with confirmed asymptomatic SARS-CoV-2 to household contacts has been described.[34] Furthermore, there have been instances of familial clusters involving asymptomatic children, as well as probable transmission from asymptomatic children

to adults outside their family.[34,37] According to these reports, asymptomatic children may play a role in transmission.[38,39] Adults' asymptomatic transmission is well documented.

Clinical features

The symptoms of COVID 19 are comparable in children and adults, although their frequency differs, however the symptoms appear to be milder in children as compared to adults; however severe instances in children have been also documented.

The spectrum of infection severity:

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

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

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

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

Similarly, 14 percent of 1.3 million cases reported to the Centres for Disease Control and Prevention (CDC) in the United States by the end of May 2020 were hospitalised, 2% were admitted to the intensive care unit (ICU), and 5% died. The risk of severe disease varies according to age, underlying comorbidities, and vaccination status.[40]

Laboratory findings

The findings of laboratory parameters are variable. In a meta-analysis, the data of following laboratory abnormalities were noted: [41,42]

- Elevated C-reactive protein: 54%
- Elevated serum ferritin: 47%
- Elevated lactate dehydrogenase: 37%
- Elevated D-dimer: 35%
- Elevated procalcitonin: 21%
- Elevated erythrocyte sedimentation rate: 19%
- Elevated leukocytes: 20%
- Lymphocytopenia: 19%
- Lymphocytosis: 8%
- Elevated serum aminotransferases: 30%
- Elevated Creatine Kinase Myocardial bands: 25%

Table 1: Diagnostic tests for COVID 19

Test category	Primary clinical use	Specimen type	Performance characteristics	Comments
NAATs (including RT-PCR)	Diagnosis of current infection	Respiratory tract specimen*	High analytic sensitivity and specificity in ideal settings. Clinical performance depends on the type and quality of the specimen and the duration of illness at the time of testing. Reported false-negative rate ranges from <5 to 40%, depending on the test used.	Time to perform the test ranges from 15 minutes to 8 hours. Turnaround time is influenced by the test used and laboratory workflow. Some assays allow home collection of specimens that are mailed in.
Serology (antibody detection)	Diagnosis of prior infection (or infection of at least 3 to 4 weeks' duration)	Blood	Sensitivity and specificity are highly variable. Detectable antibodies generally take several days to weeks to develop; IgG usually develops by 14 days after onset of symptoms.	Time to perform the test ranges from 15 minutes to 2 hours. Turnaround time is influenced by the test used and laboratory workflow.

			Cross-reactivity with other coronaviruses has been reported. Individual results should be interpreted with caution in settings of low seroprevalence; serologic tests that have high specificity still have a low PPV	It remains uncertain whether a positive antibody test indicates immunity against future infection.
Antigen tests	Diagnosis of current infection	Nasopharyngeal or nasal swabs	Antigen tests are generally less sensitive than nucleic acid tests. Sensitivity is highest in symptomatic individuals within 5 to 7 days of symptom onset.	Time to perform the test is <1 hour.

Table 2: Laboratory features associated with severe COVID-19 infection[1,18,41,42]

	Possible Limit of Threshold
Elevated levels of :	
▪ D-dimer	More than 1000 ng/mL (normal range: <500 ng/mL)
▪ CRP	More than 100 mg/L (normal range: <8.0 mg/L)
▪ LDH	More than 245 units/L (normal range: 110 to 210 units/L)
▪ Troponin	More than 2 times upper limit of normal (normal range for troponin T: males 0 to 14 ng/L and females 0 to 9 ng/L)
▪ Ferritin	More than 500 mcg/L (normal range: males 30 to 300 mcg/L and females 10 to 200 mcg/L;)
▪ CPK	More than 2 times upper limit of normal (normal range: 40 to 150 units/L)
Decreased levels of:	
▪ Absolute lymphocyte count	<800/microL (normal range for ages more than 21 years: 1800 to 7700/microL)

FERRITIN

Ferritin is the major form in which Iron is stored in both Prokaryotes and Eukaryotes. Being a globular protein complex, it stores intracellular iron in a non-toxic and soluble form. Unbound ferritin which isn't combined with iron molecule is known as Apoferritin.

Ferritin as a biomarker

Ferritin is a protein molecule that binds to iron in the centre of its core. It is found that ferritin also has some role in inflammation. It is a globular protein complex consisting of 24 protein subunits and is the main intracellular iron storage protein in both prokaryotes and eukaryotes, keeping iron in a soluble and non-toxic form. Ferritin which is not combined with iron is called apoferritin.

Ferritin and its structure:

A very important and integral part of iron homeostasis is the iron storing protein Ferritin. It makes iron available for all important cellular processes and even helps to protect protein, DNA and lipids from the potentially harmful effects of iron. It can also play a role in some other conditions which includes imflammatory conditions, neurodegenerative diseases and malignancy.

The size of Ferritin molecule is about 450 kDa protein and consists of 24 subunits. It is present in every kind of cell. In mammalian species this molecule consists of 2 subunits, which are known as the light (L) and the Heavy (H) type with a molecular weight of 19 kDA and 21 kDA respectively. Given below is the structure of ferritin molecule. Apoferritin (iron free form of protein) is spherical in shape. The ferric iron is stored in form of ferrihydrite mineral iron containing form, known as

ferritin or holoprotein. Iron is toxic to the cell as it has the propensity to generate ROS, also known as reactive oxygen species which causes direct damage to DNA and proteins.[43]

Genetic diseases hyperferritinemia occurs because of the abnormality in ferritin L-gene which results in drastically increased levels of serum ferritin. Increase in levels of H-ferritin is seen in some pathophysiologic conditions like malignancy.[43]

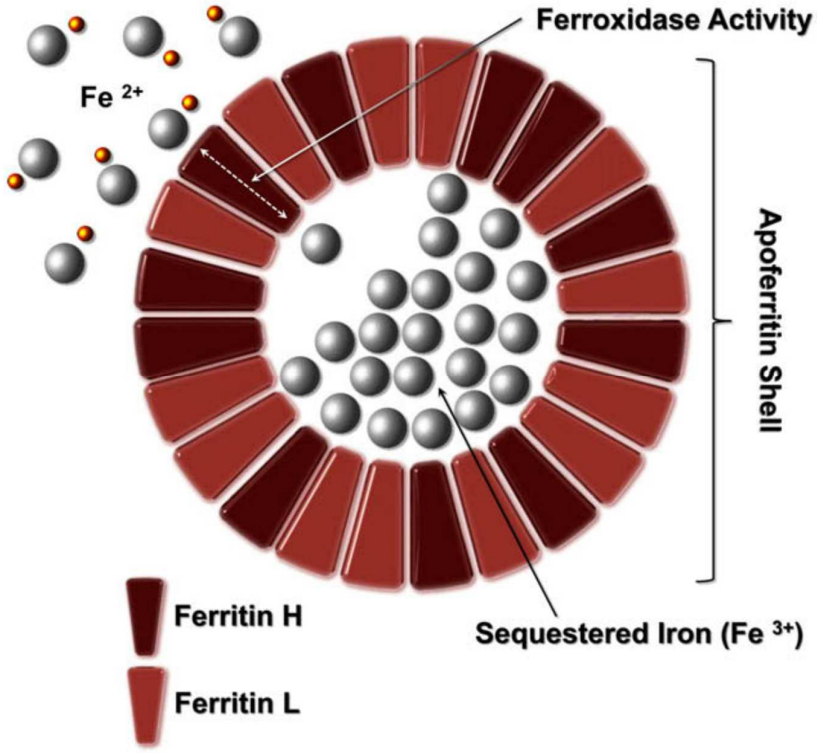

Figure 3: Structure of Ferritin

Physiological role of ferritin:

Ferritin is present both intracellular as well as extracellular compartment and act as iron binding protein. Extracellular ferritin acts as a marker of iron status and also helps in maintaining iron homeostasis as shown in figure below.[43]

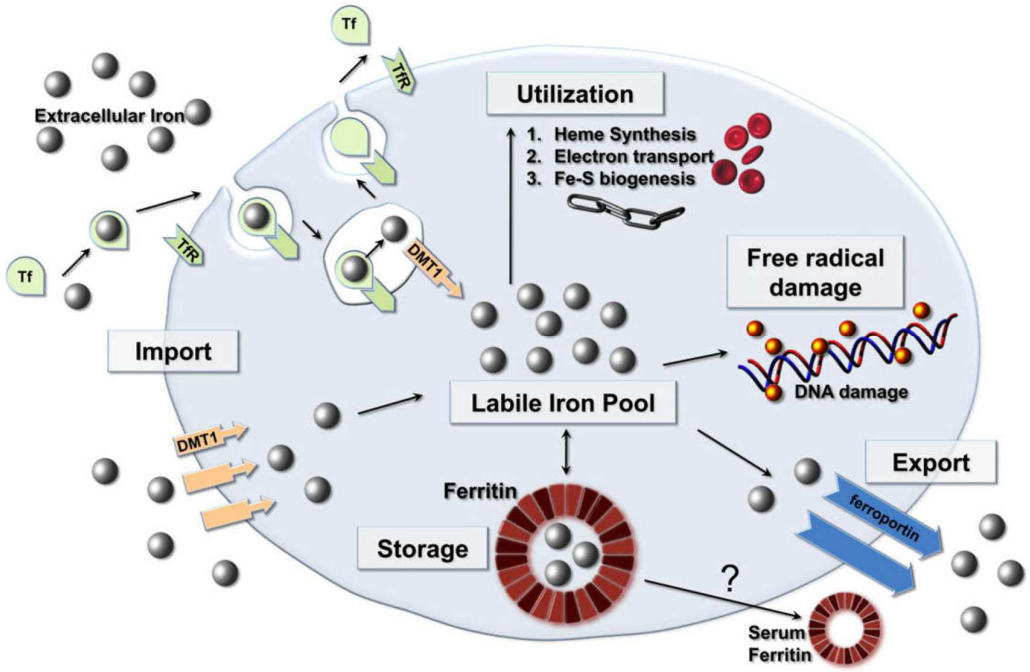

Figure 4: Role of Ferritin

Ferritin acts as a buffer in intracellular iron pool. Ferritin also acts as a parameter to help diagnose iron deficiency. Ferritin also decreases in hypothyroidsm and ascorbate deficiency and can be useful in diagnosing conditions of iron overload. A physiological process to excrete excess iron from the body does not exist. Excess iron can collect in liver and heart which eventually causes free radical injury.[43]

Iron in its free form is toxic to cells because of its propensity to form free radicles. Its role as a catalyst in the Fenton Reaction leads to the production of free radicles from reactive oxygen species which are dangerous to cellular organelles. In order to protect themselves from such dangerous free radicles, organisms have adapted by evolving an elaborate set of various protective mechanism which binds to iron and compartmentalizes the iron in the tissues to its non-toxic form. Inside the cells, iron is bound and complexed to proteins such as hemosiderin or ferritin. Free ferrous iron is bound to Apoferritin and is stored in the ferric state. Hemosiderin are

protein aggregates formed by the accumulation of ferritin within the cells of the reticuloendothelial system.

Iron can be extracted for release from Hemosiderin or Ferritin by the Reticuloendothelial cells, more readily from ferritin as compared to hemosiderin. Under normal conditions, serum ferritin correlates and acts as a surrogate marker of the total iron stores in the body and hence it cements its place as a diagnostic laboratory marker to estimate total iron stores.

Apart from its biological function, Ferritin also finds its use in engineering applications such as development of carbon nano tubes. It also finds its use in the synthesis of iron nano particles which have many emerging applications in nanobiotechnology. The role of ferritin in mitochondria is still being investigated.

Metabolism of iron and role of Ferritin:

Iron is absorbed in the proximal part of intestine. Dietary iron is in the ferric form which is first reduced by iron reductase present in the brush border epithelium. Iron on reaching inside enterocyte has two fates which depends on iron requirement. If iron demand is low in the body then iron binds to ferritin and will eventually be lost by sloughing off of the enterocyte. Hoewever if the iron requirement is high then the iron will be transferred into the circulation through ferroportin. The iron then binds to transferrin and is transported to different organs where it gets stored in the form of ferritin.[44]

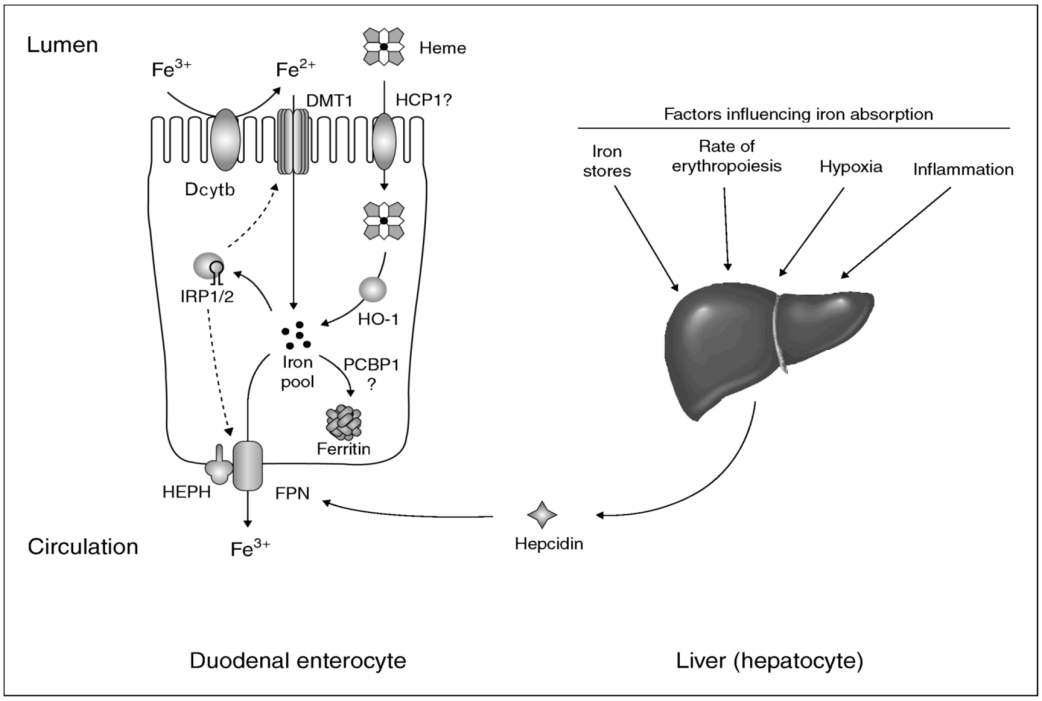

Figure 5: Iron absorption and transport[44]

Role of Hepcidin in Iron Homeostasis

Hepcidin is a protein molecule closely involved in Iron homeostasis and its levels are influenced by various factors such as erythroid activity, iron stores, inflammation and hypoxia. Positive regulators include inflammation and increased iron level and negative regulators include increased erythropoiesis and lower iron levels. All these factors affect the levels of hepcidin by causing transcriptional modification of the protein molecule which in turn affects the levels of Hepcidin. The direct effect of increased hepcidin causes decrease in the absorption of iron from the gut and increased recycling of iron into the macrophages. As hepcidin is also an acute phase reaction protein, its levels are increased in states of acute and chronic inflammation via cytokines and chemokines such as Interleukin-6. The end effect is an increased sequestration of iron in macrophages and decreased absorption of iron from the gut.[46]

Intracellular regulation of iron homeostasis:

The regulation of intracellular iron homeostasis occurs at the transcriptional level and by altering the stability of mRNA. The mRNA which codes for proteins involved in iron regulation has within it loop like domains in the untranslated regions, aka UTR in the 5' and 3' region. These regions of the mRNA are known as IRE, that is Iron Responsive Elements. IRPs are Iron Regulated Proteins which bind to the IREs present on the mRNA. There are mainly two kinds of IRP, IRP-1 and IRP-2. Although they are regulated in different ways, they have the similar function. In the 5' and 3' untranslated regions of the target mRNA, interaction of IRP and IRE takes place. Binding of IRP to the 5' end IRE results in decreased translation. Amongst the various iron regulatory proteins, erythroid ALA synthase (ALAS2), ferritin (Both L and H chain), mitochondrial aconitase, Hypoxia Inducible Factor (HIF 2) and Ferroportin have IREs in the 5' end.[47]

The binding of IRP on the 3' end however results in the stabilization of mRNA and increased translation. The IREs for the proteins Divalent Metal Transporter (DMT-1) and Transferrin Receptor 1 (TFR1) are present on the 3' end of its respective mRNA. By modifications at the level of transcription and translation, the binding of IRP at the 3' end increases the production DMT1 and TfR1.[48]

The induction of Iron-regulatory proteins takes place whenever iron levels decrease. When the levels of Iron are on the higher side, the free iron binds to sulphur molecules and these iron sulphur cluster inhibit the binding IRPs to their respective IREs by competitive inhibition. Binding of IRPs to iron sulphur cluster promotes their ubiquitination and proteasomal degradation.[45] These iron sulphur clusters aren't formed when the levels of cellular iron is low. Due to lack of competitive binding on

the IRPs, they can freely bind to the IREs. This results in increase in the cellular uptake with decrease in the storage and utilization of iron. [45]

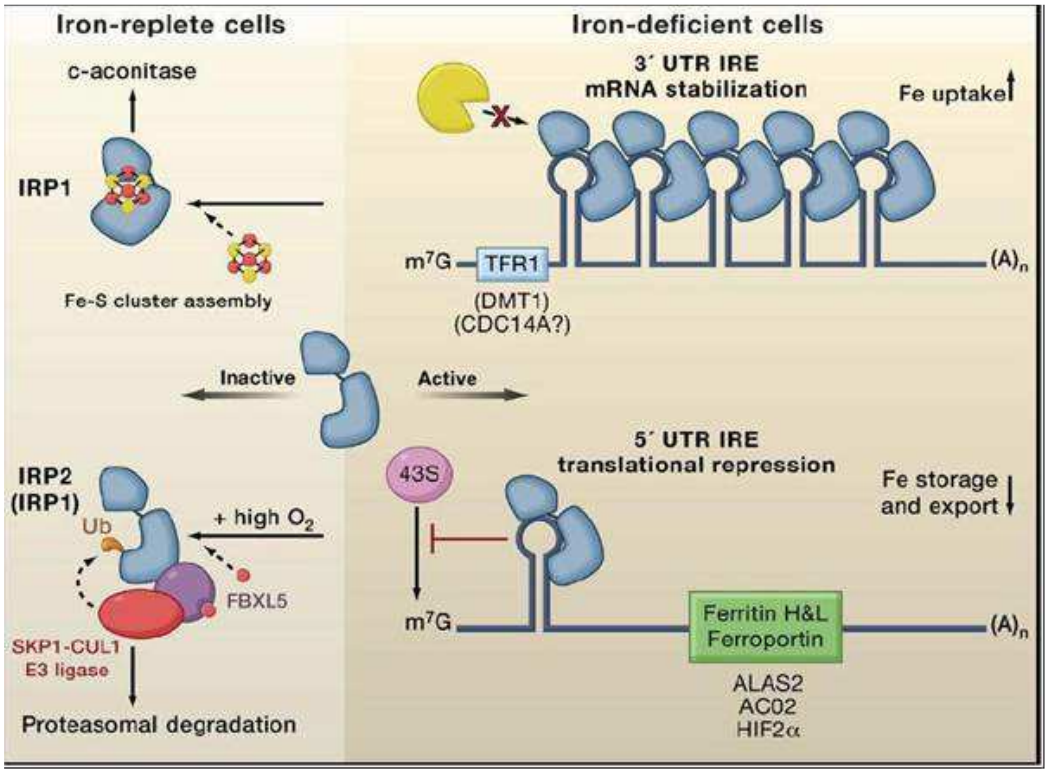

Figure 6: Regulation of Intracellular iron levels.[45]

Role of Ferritin in inflammation:

Along with its role in iron homeostasis, ferritin is also serves as a key serum marker in inflammatory conditions. Ferritin, which is also an acute phase reactant is found to be increased in acute inflammatory conditions such as rheumatological, infections, hematological and cancer associated ilnesses.

Increase in the levels of serum ferritin will cause increase in inflammation through inflammatory mediators such as IL-1β, iNOS, RANTES and ICAM produced by stellate liver cells. Ferritin also acts as an immunosuppressant via increase in IL-10, decrease in B cell proliferation, decrease in T cell multiplication and decrease in IgG production. Therefore, it has been postulated that high ferritin levels are not just

the product of inflammation but rather may have a pathogenic role through its effect on signalling pathway as a part of the innate immune response and modulating the functioning of lymphocytes.

Apart from the role in iron homeostasis, ferritin also serves to protect the host against foreign pathogens by limiting the bioavailability of iron to the pathogens. During an episode of active infection, decreased availability of iron causes decrease in the proliferation of pathogens. It has also been observed that oral iron supplementation during an infection leads to increased mortality and morbidity in humans. It is common to observe a high serum level of ferritin during the active phase of an infection where viremia and bacteraemia predominates. In In vitro and In vivo conditions, Hepatocytes (Liver), Kupfer cells (Liver), proximal tubules (Kidney) and macrophages have all been noted to secrete ferritin. It has also been noted that increased ferritin positively corelates with increased mortality regardless of the underlying condition.[49]

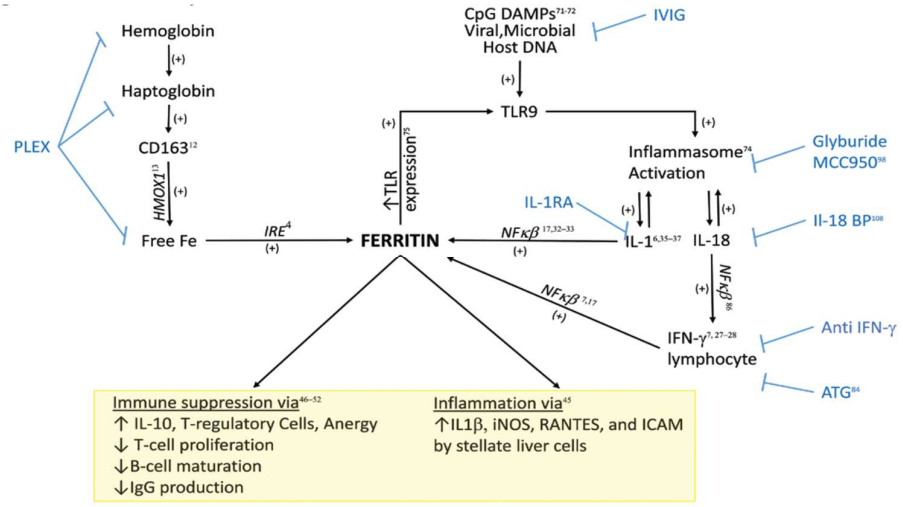

Figure 7 : Role of Ferritin in Inflammatory Positive Feedback

Table 3: Normal value of Ferritin[50]

Age	Serum ferritin (normal)- ng/ml
0-6 weeks	0-400
7weeks- 1year	10-95
1-9 year	10-60
10-18 year (male)	30-300
10-18 year(female)	15-200

Ferritin as a Diagnostic marker

Serum ferritin is routinely included in the work up for patients suffering from Anaemia. It is also used in many rheumatological conditions where it acts as a surrogate marker of ongoing active inflammation. In anaemia, ferritin levels often reflect the total amount of storage form of iron in the body and is classically elevated in anaemia of chronic diseases.

For reference purposes, the normal levels of Ferritin in serum range from 30 to 300ng/ml and 15 to 200ng/ml in females.

Lowered

Iron deficiency anaemia is classically associated with lower levels of ferritin. Serum ferritin serves as one of the most sensitive laboratory test in the diagnosis of iron deficiency anaemia. Lower levels of ferritin and its association with Restless Leg Syndrome is also well documented in various studies.

In one of the studies conducted in Paris, France lower levels of iron and ferritin had a direct correlation with the severity of ADHD symptoms.[51]

Elevation in Serum Ferritin

Excess amount of iron can cause elevation in the levels of Serum Ferritin which would otherwise be excreted in stool. In disorders causing iron overload, such as Porphyria and Hemochromatosis, the levels of Serum Ferritin are found to be abnormally on the higher side which also serves as a diagnostic and prognostic indicator of the disease.

In a state of acute infection, Serum Ferritin is found to be on the higher side due to it being an acute phase reactant. A simultaneous normal value of C reactive protein can help to exclude serum ferritin elevations caused due to acute phase reactions.

Acute malnourishment may also cause elevation in the levels of Serum Ferritin.[52]

Ferritin as an acute phase protein:

There are two main important roles of ferritin in the body, its primary role is in the intracellular sequestration of iron and its secondary role is its storage function during the activation of immune system. Macrophage, Cancer cells and hepatocytes all produce some amount of ferritin and its levels are classically elevated in acute infections. This summarises the role of ferritin under both steady state conditions and during an acute phase response.

Ferritin is also found in the circulation and through its release from damaged cells and through rough endoplasmic reticulum in normal cells, it contributes to increase in plasma ferritin levels. Clearance of plasma ferritin is mainly by hepatocytes.

Apart from the amount of iron storage and inflammatory activity, other conditions which affect the level of serum ferritin include tissue necrosis, infections, malnutrition, increased red blood cell turnover and surgeries. With all of these conditions considered, the direct simple correlation between the concentration of serum ferritin and the storage amount of iron in the body is no longer possible to estimate. In neoplastic diseases increase in ferritin levels are caused due to a higher production of ferritin by the cancerous cells. Solid tumours such as those of pancreas, liver and breast have a propensity to produce increased amount of ferritin, especially the H subunit predominant variant.

Increased level of serum ferritin is also seen in some diseases like still's disease (a systemic inflammatory disease), hemophagocytic syndrome, (a disorder associated with autoimmunity), patients with risk factor of coronary artery diseases and those with a history of myocardial infarction.

Lower levels of serum ferritin are seen in certain neurological disorders like restless leg syndrome, neuroferritinopathy (disorder of basal ganglia) and also in certain neurogenic causes of syncope in children.

Role of Ferritin to Transferrin ratio in COVID-19 patients to assess the severity

In a study conducted by Rosa Bellmann-Weiler, Lukas Lanser et al., at Department of Internal Medicine, Centre for Infectious Disease, Immunology and

Rheumatology, Medical School of Innsbruck, Austria, they found that dysregulated Iron homeostasis and Anaemia, especially with an increased Ferritin/Transferrin ratio is associated with a higher risk for the need of mechanical ventilation and a higher incidence of ICU admission in COVID-19 patients, thus establishing a relation of Iron Profile markers with COVID-19 severity. Studies trying to establish a particular Ferritin/Transferrin ratio have so far been inconclusive although in the above study, a Ferritin/Transferrin ratio of more than 10 suggested a higher risk of admission in the ICU and a higher incidence of patients requiring mechanical ventilation. The limitation of this study was however the short cohort observational period from 25th February 2020 to 20th May 2020. Also the study was not able to explore whether the anaemia which could be pre-existing before the onset of COVID-19 disease was already was a risk factor for more severe disease or a fatal outcome.[3]

In a study conducted by Katie-May McLaughlin et al., it was found that transferrin was upregulated in cells infected with SARS-CoV-2 as compared to normal non infected cells. Their investigations further revealed transferrin as an important factor playing a role in COVID-19 related coagulopathy. In cells infected with SARS-CoV-2, the transferrin expression was found to be much higher, especially in older age groups and male population. Moreover, a rise in the levels of transferrin levels was seen to have a direct correlation during the progression of COVID-19 infection further cementing the link between Iron Profile biomarkers like Transferrin and Ferritin and the pathogenesis and severity of COVID-19 infection. The above study also found out that locally produced Transferrin, independent of circulating Transferrin levels may contribute to the pathology of COVID-19 disease. For example, Transferrin is locally produced by neurological tissue like brain and spinal cord and higher levels are associated with increased incidence of ischemic

stroke, haemorrhagic stroke and hypercoagulability. Apart from hypercoagulability which predisposes COVID-19 patients to ischemic stroke, transferrin also causes cytotoxic damage associated with haemorrhagic stroke by increasing cellular uptake of iron. Higher levels of transferrin are found to be associated with Metabolic syndrome and Diabetes which have shown to exacerbate the severity of COVID-19 disease. However, one of the drawbacks of the above study was the limitation in sample size which was just 980. Also since it was a gene analysis study, it would make it more difficult to replicate in future due to resource limited settings in most centres. [53]

In a Systematic Review and Meta-analysis study conducted by PE Taneri et al., on the correlation between Anaemia and Iron Metabolism in COVID-19 disease, published in European Journal of Epidemiology clearly emphasizes the need for future studies to explore the impact of iron metabolism and anaemia in the pathophysiology, prognosis, and treatment of COVID-19. Although the study analysed almost 57,563 COVID-19 patients, the study period was limited only up to 3rd August 2020. Also, it was found that the follow up was incomplete in almost half of the patients. The analysis was also limited to data only on human subjects and articles published in English only. The observational study used for the meta analysis also didn't include case reports and case series.[54]

In a study conducted by Basting A et al., to assess the effect of iron supplement or iron chelator on the severity of COVID-19 infection, the levels of Iron, saturated transferrin and haemoglobin was found to be reduced in all the subjects as compared to the control group, although the level of ferritin was found to be higher in the patient group. After carefully adjusting the data for various parameters like age

and sex, the odds ratio (OR) of the disease was found to be higher in almost all the groups including moderate, severe, and critical groups which were 2.95, 6.1 and 8.34 respectively. Similarly, the Odds ratio was found to be reduced with lower levels of iron in the mild, moderate, severe and critical groups which were 0.96, 0.96, 0.94 and 0.95 respectively. Although both Iron and Ferritin have a higher AUC for COVID-19 disease prognosis, when it comes to disease severity, Serum Ferritin has the highest AUC. This indicated that routine measurement of Serum Iron and Ferritin can help us to determine the prognosis and severity of the disease. Based on the results of the above study, the usage of iron chelators to decrease the amount of iron intake can be of significant therapeutic benefit.[55]

In one of the study by Claise C et al., to assess the effect of low transferrin level on inflammation in patients with COVID-19, it was observed that in severe COVID-19, there was a large rise in IL-6, CRP, and ferritin levels, as well as a drop in transferrin and iron levels. The levels of Transferrin adversely predicted differences in IgG and IgM levels ($P<0.001$), along with an increase in IL-6 and CRP levels of 34.4% and 36.6% respectively ($P<0.005$). Reduced serum Iron and Transferrin levels, as well as elevated CRP and Ferritin, were substantially linked to COVID-19's heightened inflammatory and immunological status. Based on the results of the above study, both Ferritin and Transferrin can be effectively used in the prediction of disease progression and severity.[56]

In a study by Benoit JL et al., Anaemia and COVID-19 severity, it was found that future studies should include a larger sample size of cohort to assess the prognostic value of Anaemia during the course of illness.[57]

In a retrospective study by Banchini F et al., to assess the serum ferritin level in inflammation. The median (interquartile range) serum ferritin level in group A was 674ng/mL, which was two times the threshold of 300 ng/mL in nine out of seventeen cases (52%). The median (IQR) ferritin level in group B total blood samples was 231, and 149 in the subgroup with leucocytosis. Group A had a considerably higher ferritin median level than group B overall (two-tailed Mann-Whitney test, $p<0.0001$) and the subgroup with leucocytosis ($p<0.0014$). The above study indicates that Iron metabolism appears to have a direct role in COVID-19 infection and that Serum Ferritin can be used as a diagnostic and prognostic marker in COVID-19 infection.[58]

In order to better understand the link between various Iron parameters and the severity of COVID-19 infection, a study was conducted by Yanling LV et al wherein the median age of the participants was 63 years (IQR – 54 to 73) and the average length of hospital stay duration was about 28 days (IQR 17 to 40). After adjusting for pre-existing comorbidities, gender, age and IL-6, the adjusted risk ratios of severe COVID 19 infection was found to be 0.19 [0.08 0.48 at 95% CI], 4.38 [1.86 – 10.33 at 95% CI] and 0.42 [0.22 – 0.83 at 95% CI] for Transferrin, Serum Ferritin and Serum Iron respectively. Apart from predicting the severity, these indices also had a significant correlation with a heightened risk of Acute Liver Injury, Coagulopathy, Acute Myocardial Damage, ARDS, Acute Kidney Injury as well as a higher propensity to cause cytokine elevations, thereby predisposing to cytokine storm. The risk of Multiple Organ Damage as well as increased severity was seen with patients with lower levels of serum Iron. The findings of this study concluded that the above association between Iron parameters and COVID-19 severity may facilitate the use of Iron parameters as a valuable biomarker for assessing the risk factors and prognosis of COVID-19.[59]

MATERIALS AND METHODS

Source of data: Patients admitted in the COVID 19 dedicated wards of KLES Dr PRABHAKAR KORE HOSPITAL, BELGAUM and fulfilling the inclusion criteria of the study were included.

Study design: One Year hospital based Cross-Sectional study.

Study period: SEPTEMBER 2020 to DECEMBER 2021 (One year).

Sample Size: 138

Sample method: Formula used for sample size calculation:

$$n = \left[\frac{\left(Z_{\alpha/2} + Z_{\beta}\right)}{C}\right]^2$$

Where C is,

$$C = 0.5 \times log_e\left[{}^{(1+r)}\big/_{(1-r)}\right]$$

In the above formula, r is the correlation coefficient, at 95% confidence level $Z_{\alpha/2}$ is 1.96 and Z_{β} value for 85% power is 1.0364.

We assume that there is a positive correlation is present between Ferratin and CRP levels (from below reference).[59] Correlation coefficient assumed as 0.25. This correlation coefficient is used in the sample size calculation for this study.

With 85% power, 95% confidence level and with above correlation coefficient, sample size required is 137.63≈ 138. Minimum sample size required is **138** subjects.

STATISTICAL ANALYIS

METHODS:

Data is analysed using statistical software R version 4.2.1 and Microsoft Excel. Categorical variables given in the form of frequency tables. Continuous variables given in Mean ± SD / Median (Min, Max) form. Chi square test is used check the association between categorical variables. Two sample t test is used to compare means over outcome. Mann Whitney U test is used to compare the distribution of variables over outcome. Applicability of Ferritin/Transferrin ratio to predict outcome is checked by Logistic regression and Receiver Operating Characteristic (ROC) curves. P-value less than or equal to 0.05 indicates statistical significance.

RESULTS

Data contains measurement on 168 subjects. Out of them, 3 (1.79%) subjects got worsened and 1 (0.595%) got discharged from hospital in the study period. Hence, remaining 164 subjects are considered whose age ranges from 20 to 90 years with mean age 57.35 ± 16.59 years. The following table gives the distribution of demographic variables over outcome.

Table 4: Distribution of demographic variables over outcome.

Variables	Sub Category	Outcome		Total	p-value
		Died	Survived		
Age (years)	Mean ± SD Median (Min, Max)	64.93 ± 12.09 66 (32, 90)	49.59 ± 17.03 52 (20, 85)	57.35 ± 16.59 60 (20, 90)	**< 0.001^{MW*}**
Gender	Female	10 (12.05%)	16 (19.75%)	26 (15.85%)	0.1768^{C}
	Male	73 (87.95%)	65 (80.25%)	138 (84.15%)	

*Abbreviation: MW – Mann Whitney U test, C – Chi square test, * indicates statistical significance.*

From Mann Whitney U test, it is observed that, there is significant difference in the distribution of age over outcome. Further, it can be observed that, the mean age of mortality group is more than the survival group.

From Chi square test, it is observed that, there is no significant difference in the distribution of gender over outcome.

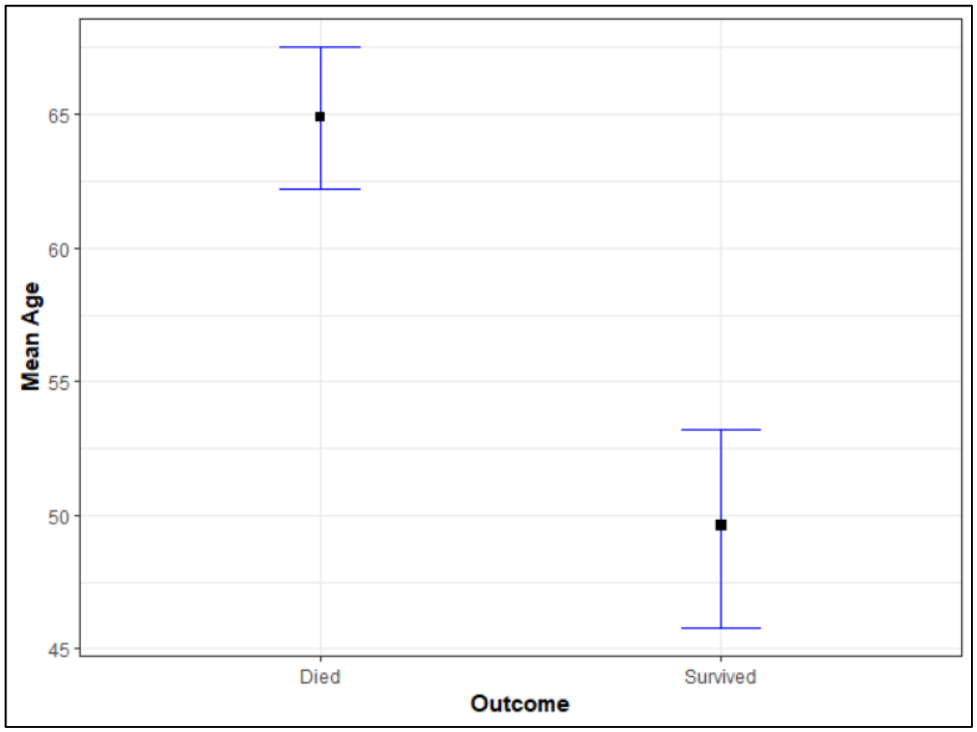

Figure 1: Mean plot of age over outcome.

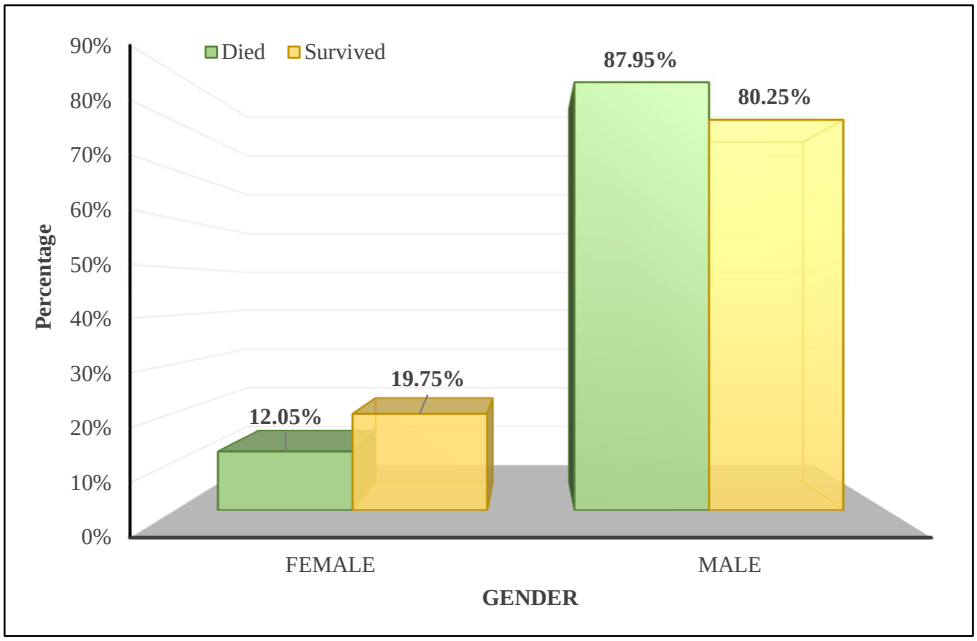

Figure 2: Distribution of gender over outcome.

The following table gives the comparison of symptoms with outcome.

Table 5: Comparison of symptoms over outcome.

Symptoms	Outcome		Total	p-value
	Died	Survived		
Fever	51 (61.45%)	57 (70.37%)	108 (65.85%)	0.2282^{C}
Cough	52 (62.65%)	59 (72.84%)	111 (67.68%)	0.1631^{C}
Breathlessness	74 (89.16%)	49 (60.49%)	123 (75%)	$\mathbf{< 0.001^{C}*}$
Myalgia	20 (24.1%)	28 (34.57%)	48 (29.27%)	0.1406^{C}
Vomiting	2 (2.41%)	0	2 (1.22%)	0.5067^{MC}
Loose Stools	1 (1.2%)	2 (2.47%)	3 (1.83%)	0.6192^{MC}
Weakness	5 (6.02%)	12 (14.81%)	17 (10.37%)	0.0648^{C}
Abdominal Pain	1 (1.2%)	0	1 (0.61%)	1^{MC}
Low Urine	1 (1.2%)	0	1 (0.61%)	1^{MC}
Decreases Appetite	5 (6.02%)	0	5 (3.05%)	0.069^{MC}
Hematuria	1 (1.2%)	0	1 (0.61%)	1^{MC}
Sore Throat	1 (1.2%)	0	1 (0.61%)	1^{MC}
Chest Pain	2 (2.41%)	3 (3.7%)	5 (3.05%)	0.6917^{MC}
Altered sensorium	1 (1.2%)	0	1 (0.61%)	1^{MC}

*Abbreviation: C – Chi square test, MC – Chi square test with Monte Carlo simulation, * indicates statistical significance.*

From Chi square test, it is observed that, there is significant difference in the distribution of breathlessness over the outcome. Further, it can be noted that breathlessness symptom was observed more in cases of subjects which didn't survive. There is no significant difference in the distribution of other symptoms over outcome.

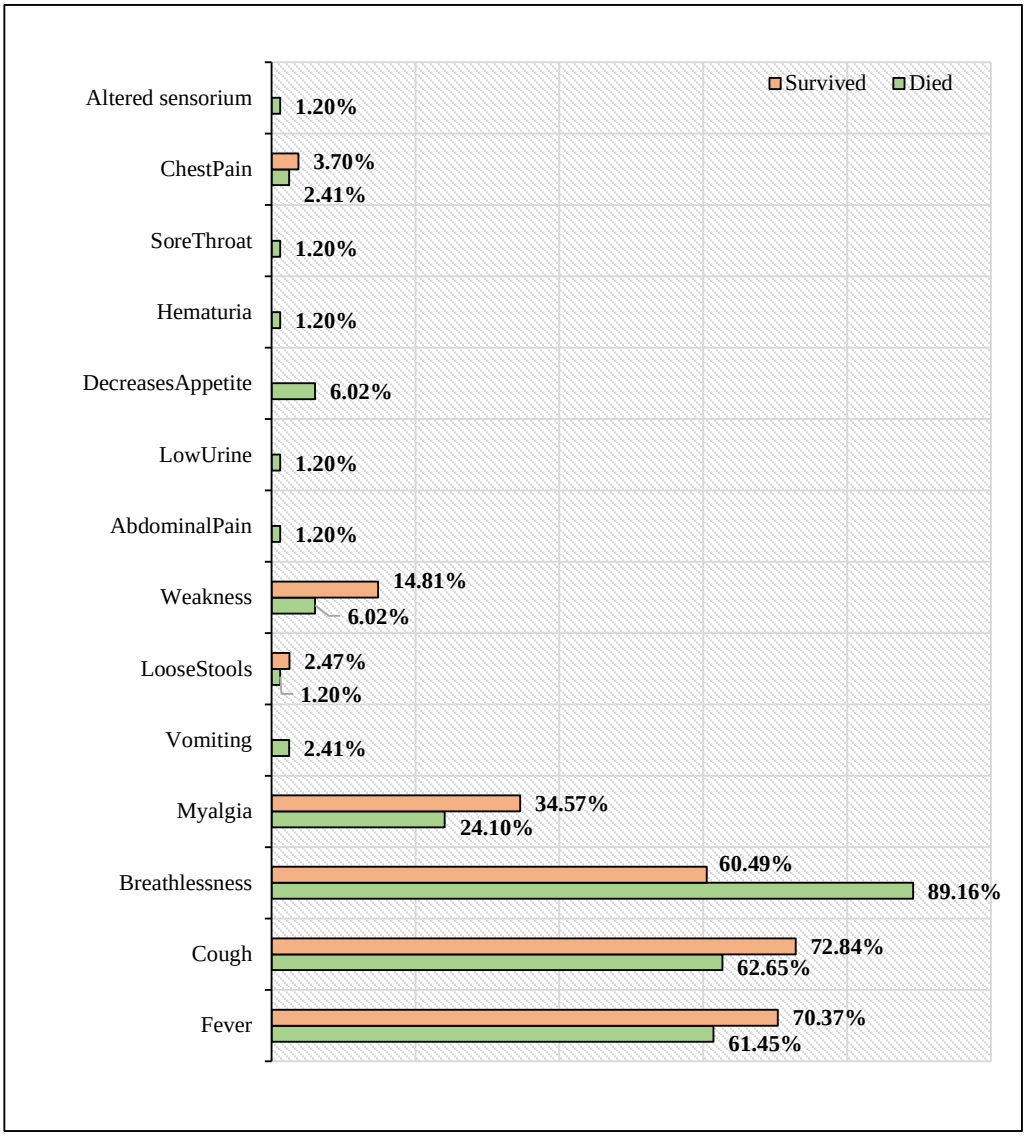

Figure 3: Distribution of symptoms over outcome.

The following table gives the comparison of O2 modality over outcome.

Table 6: Comparison of O2 modality over outcome.

O2 Modality	Outcome		Total	p-value
	Died	Survived		
HFO	1 (1.2%)	0	1 (0.61%)	< **0.001**[MC]*
NIV	22 (26.51%)	0	22 (13.41%)	
O2 MASK	13 (15.66%)	36 (44.44%)	49 (29.88%)	
RA	0	41 (50.62%)	41 (25%)	
RBM	47 (56.63%)	4 (4.94%)	51 (31.1%)	

*Abbreviation: MC – Chi square test with Monte Carlo simulation, * indicates statistical significance.*

From Chi square test, it is observed that, there is significant difference in the distribution of O2 modalities over the outcome.

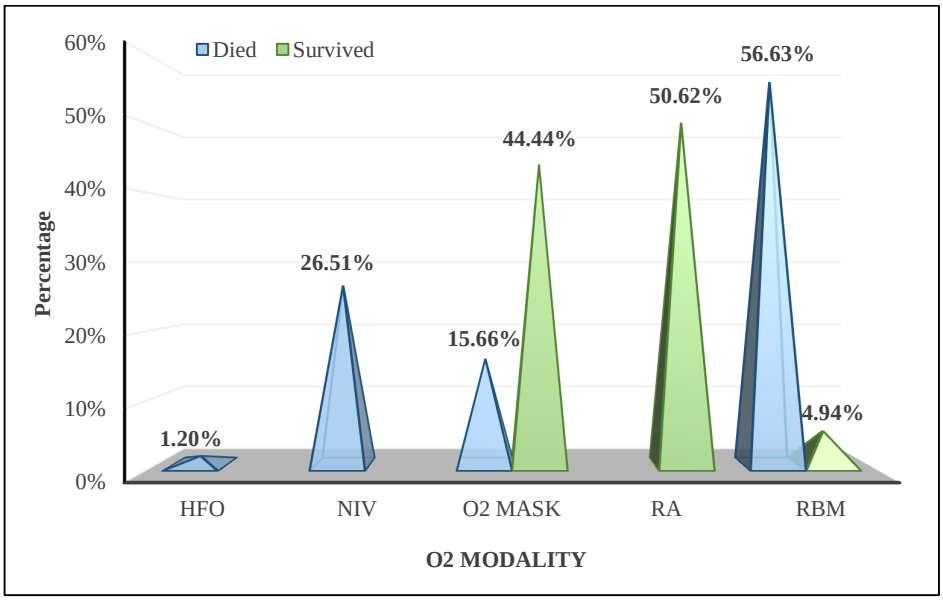

Figure 4: Distribution of O2 modality over outcome.

The following table gives the comparison of time to Hospital from Symptom Onset over outcome.

Table 7: Comparison of Time to Hospital from Symptom Onset over outcome.

Variable	Outcome		Total	p-value
	Died	Survived		
Time to Hospital from Symptom Onset	4.24 ± 2.51 4 (1, 20)	3.59 ± 1.74 3 (1, 10)	3.92 ± 2.18 3 (1, 20)	0.0583^{MW}

Abbreviation: MW – Mann Whitney U test.

From Mann Whitney U test, it is observed that, there is no significant difference in the distribution of time to hospital from symptoms onset over outcome.

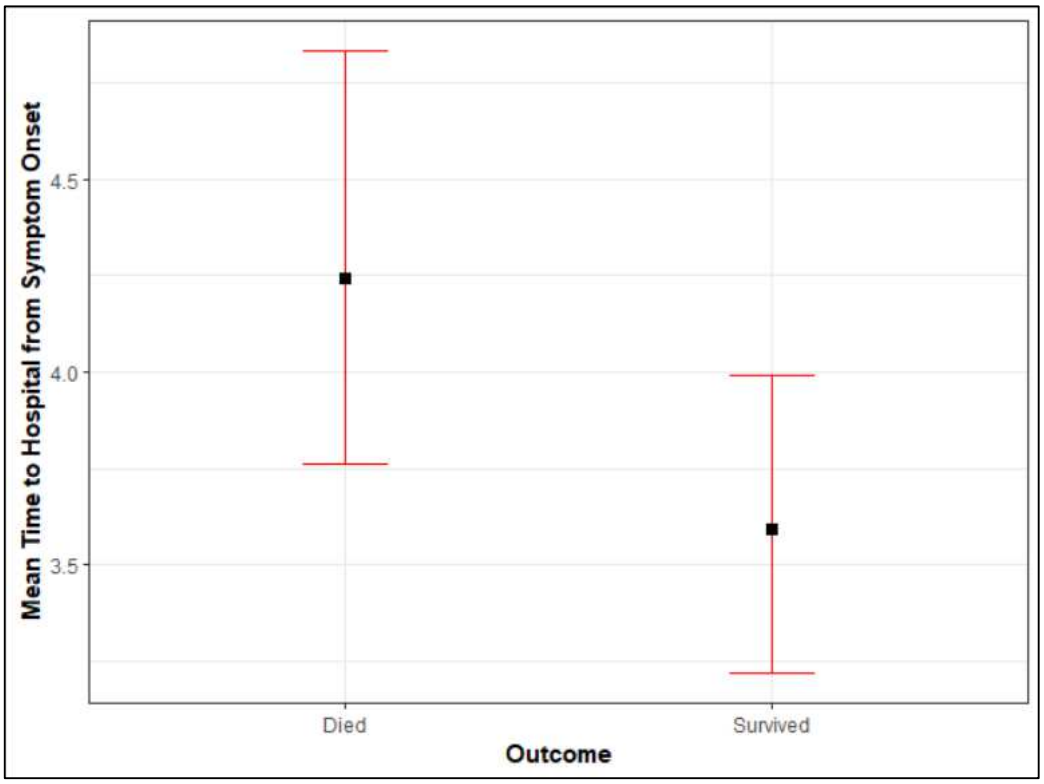

Figure 5: Mean plot of Time to Hospital from Symptom Onset over outcome.

The following table gives the comparison of Respiratory rate and SPO2 at admission over outcome.

Table 8: Comparison of Respiratory rate and SPO2 at admission over outcome.

Variable	Outcome		Total	p-value
	Died	Survived		
Respiratory rate	27.81 ± 5.86 27 (12, 45)	18.8 ± 5.16 18 (9, 32)	23.36 ± 7.12 23 (9, 45)	**< 0.001^{MW*}**
SPO2	84.52 ± 14.82 88 (31, 100)	94.05 ± 4.47 96 (77, 100)	89.23 ± 11.96 93 (31, 100)	**< 0.001^{MW*}**

*Abbreviation: MW – Mann Whitney U test, * indicates statistical significance.*

From Mann Whitney U test, it is observed that, there is significant difference in the distribution of respiratory rate and SPO2 at admission over outcome. Further, it can be noted that mean respiratory rate is more in those who didn't survive and mean SOP2 admission is more in those who survived.

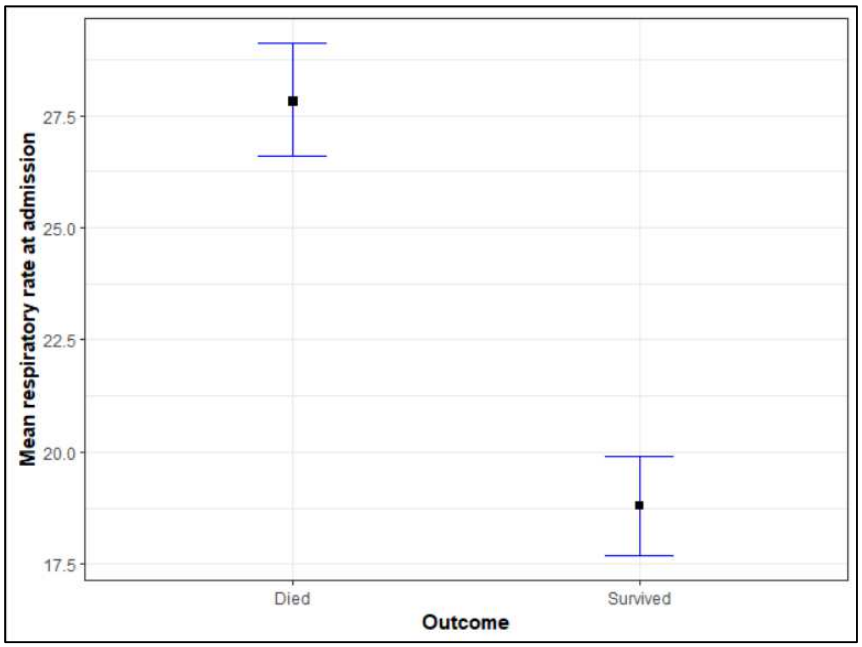

Figure 6: Mean plot of Respiratory rate at admission over outcome.

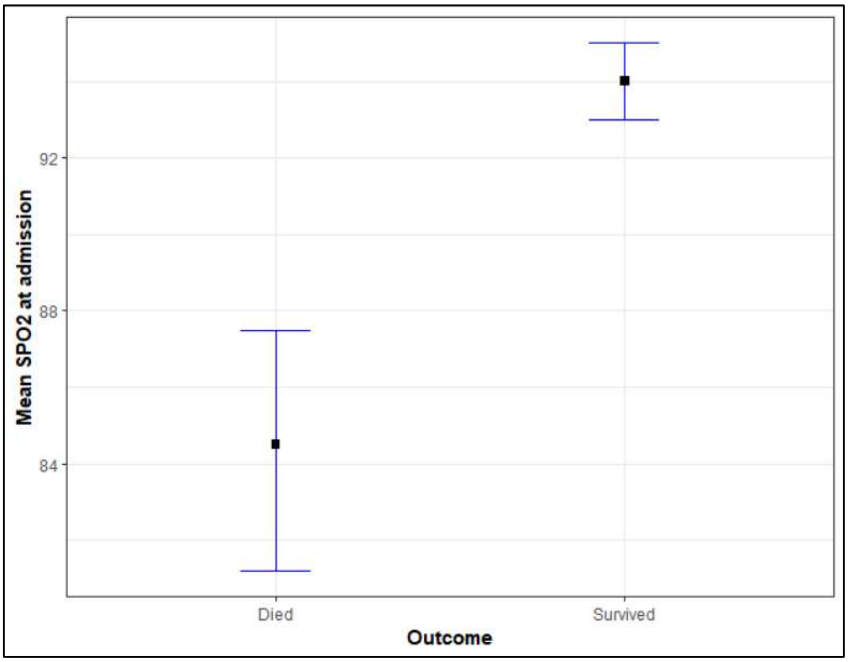

Figure 7: Mean plot of SPO2 at admission over outcome.

The following table gives the comparison of comorbidity over outcome.

Table 9: Comparison of Comorbidity over outcome.

Comorbidity	Outcome		Total	p-value
	Died	Survived		
DM	54 (65.06%)	36 (44.44%)	90 (54.88%)	**0.008^{C*}**
HTN	43 (51.81%)	31 (38.27%)	74 (45.12%)	0.0816^{C}
IHD	13 (15.66%)	4 (4.94%)	17 (10.37%)	**0.0243^{C*}**
CKD	5 (6.02%)	2 (2.47%)	7 (4.27%)	0.4598^{MC}
OSA	1 (1.2%)	0	1 (0.61%)	1^{MC}
Obesity	1 (1.2%)	0	1 (0.61%)	1^{MC}
Asthma	1 (1.2%)	3 (3.7%)	4 (2.44%)	0.3638^{MC}
BPH	0	1 (1.23%)	1 (0.61%)	0.5062^{MC}
CA Breast	0	1 (1.23%)	1 (0.61%)	0.5062^{MC}
Parkinson's	0	1 (1.23%)	1 (0.61%)	0.5062^{MC}
AKI	1 (1.2%)	0	1 (0.61%)	1^{MC}
CVA	1 (1.2%)	0	1 (0.61%)	1^{MC}
TB	2 (2.41%)	1 (1.23%)	3 (1.83%)	1^{MC}
Hypothyroidism	2 (2.41%)	0	2 (1.22%)	0.5067^{MC}

*Abbreviation: C – Chi square test, MC – Chi square test with Monte Carlo simulation, * indicates statistical significance.*

From Chi square test, it is observed that, there is significant difference in the distribution of DM and IHD over the outcome. Further, it can be noted that the proportion of DM and IHD is more in case of subjects who didn't survive. There is no significant difference in the distribution of other comorbidity over outcome.

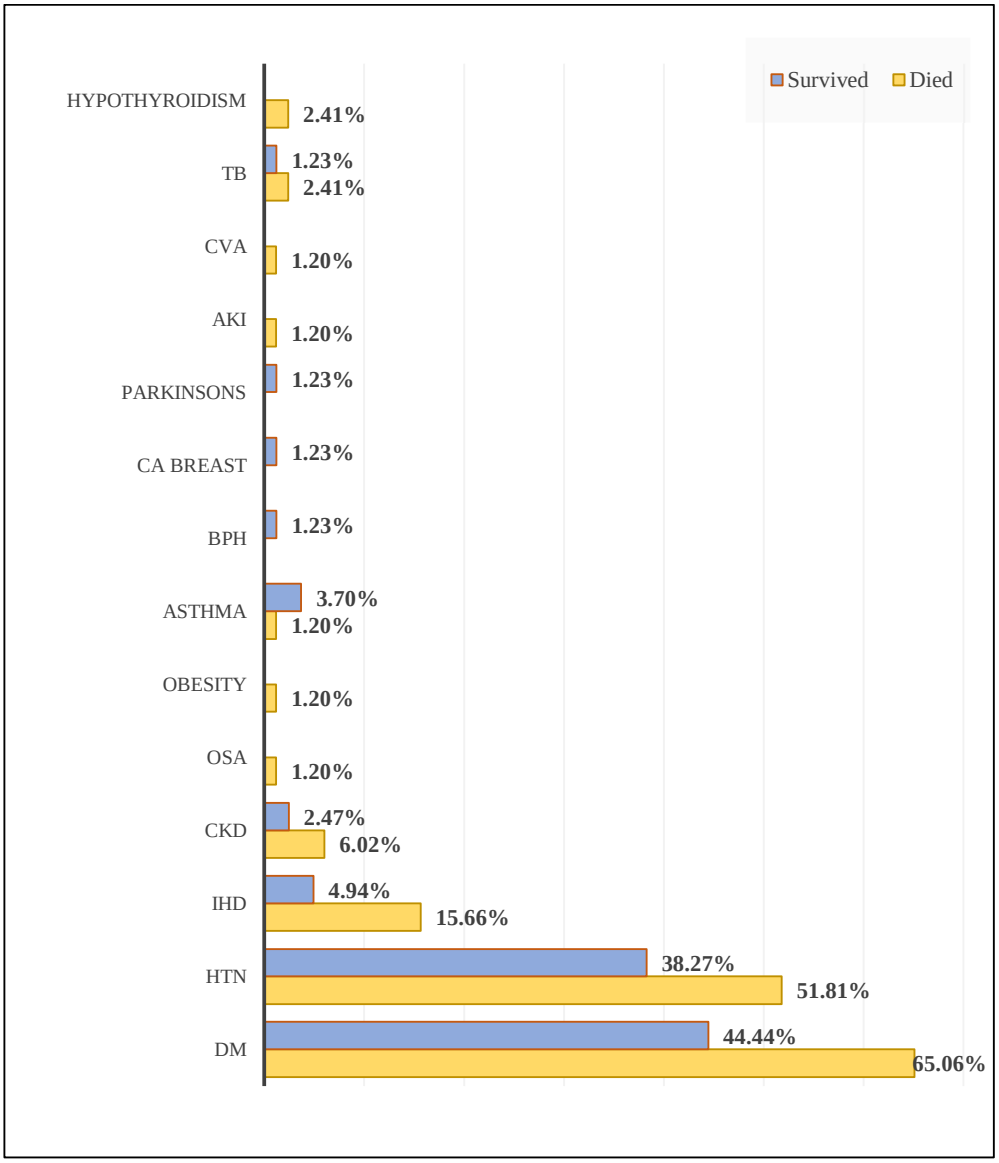

Figure 8: Distribution of comorbidities over outcome.

The following table gives the comparison of different parameters over outcome.

Table 10: Comparison of different parameters over outcome.

Variable	Outcome		Total	p-value
	Died	Survived		
CT severity score	19.35 ± 4.12 20 (5, 25)	12.91 ± 5.11 13 (4, 26)	16.17 ± 5.64 16 (4, 26)	**< 0.001^{MW*}**
Hb	12.87 ± 2.05 12.6 (8.5, 18)	12.53 ± 2.23 12.4 (7.3, 18.3)	12.7 ± 2.14 12.55 (7.3, 18.3)	0.2985^{t}
TLC	12.5 ± 7.53 11.6 (2.6, 47.1)	8.26 ± 3.5 7.2 (4.1, 21.6)	10.4 ± 6.25 9.15 (2.6, 47.1)	**< 0.001^{MW*}**
Neutrophil (%)	84.01 ± 10.12 87 (62, 98)	69.26 ± 13.57 70 (41, 95)	76.73 ± 14.02 77 (41, 98)	**< 0.001^{MW*}**
Lymphocyte (%)	11.49 ± 10.1 8 (1, 64)	22.53 ± 12.2 20 (3, 48)	16.95 ± 12.45 14 (1, 64)	**< 0.001^{MW*}**
Platelet (in thousand)	208.73 ± 98.5 195 (38, 464)	235.76 ± 84.15 229 (2.29, 439)	222.09 ± 92.41 214 (2.29, 464)	0.055^{MW}
Ferritin	1217.9 ± 561.05 1133 (46.52, 3037)	643.16 ± 363.05 629 (27.38, 2000)	934.03 ± 553.28 847.3 (27.38, 3037)	**< 0.001^{MW*}**
Transferrin	201.6 ± 60.69 190 (102, 396)	279.07 ± 56.79 273 (165, 398)	239.87 ± 70.32 243 (102, 398)	**< 0.001^{MW*}**
Ferritin/Transferrin ratio	6.67 ± 3.58 6.22 (0.19, 18.52)	2.34 ± 1.35 2.24 (0.13, 8.03)	4.53 ± 3.47 3.26 (0.13, 18.52)	**< 0.001^{MW*}**
LDH	673.76 ± 435.42 630 (126.1, 3650)	369.37 ± 160.3 353 (105, 1012)	522.5 ± 361.65 425 (105, 3650)	**< 0.001^{MW*}**
hsCRP	171.52 ± 100.99 178 (11, 652)	64.75 ± 53.06 43 (7, 221)	118.79 ± 96.85 89 (7, 652)	**< 0.001^{MW*}**
IL-6	96.94 ± 59.92 89 (10.05, 289)	69.29 ± 56.35 52.2 (4.54, 314.8)	83.28 ± 59.64 69.95 (4.54, 314.8)	**< 0.001^{MW*}**
d-Dimer	2749.53 ± 1682.17 2345 (244, 5000)	1221.6 ± 1060.87 893 (344, 5000)	1994.88 ± 1600.94 1259 (244, 5000)	**< 0.001^{MW*}**
Urea	64.34 ± 44.16 48.5 (18, 265)	32.53 ± 16.09 31 (8, 85)	48.53 ± 36.84 36 (8, 265)	**< 0.001^{MW*}**
Creatinine	1.54 ± 1.72	1.1 ± 0.71	1.32 ± 1.33	**0.0020^{MW*}**

	1.1 (0.6, 11.2)	0.98 (0.49, 6.4)	1.02 (0.49, 11.2)	
Bilirubin	1.01 ± 1.31 0.68 (0.14, 8.26)	0.84 ± 0.99 0.68 (0.13, 9)	0.93 ± 1.16 0.68 (0.13, 9)	0.793^{MW}
SGOT	146.68 ± 818.43 40.5 (12, 7437)	31.86 ± 19.13 28 (11, 116)	89.63 ± 581.73 32 (11, 7437)	**< 0.001^{MW*}**
SGPT	102.79 ± 583.85 31.5 (11, 5318)	29.38 ± 16.51 27 (10, 116)	66.31 ± 414.65 29 (10, 5318)	**0.0433^{MW*}**
RBS	223.66 ± 100.12 212 (45, 509)	163.9 ± 73.69 137 (26, 380)	193.96 ± 92.69 175 (26, 509)	**< 0.001^{MW*}**

Abbreviation: MW – Mann Whitney U test, t – Two sample t test, * indicates statistical significance.

From Mann Whitney U test, it is observed that, there is significant difference in the distribution of CT severity score, TLC, Neutrophil, Lymphocyte, Ferritin, Transferrin, Ferritin/Transferrin ratio, LDH, hsCRP, IL-6, d-Dimer, Urea, Creatinine, SGOT, SGPT and RBS over outcome. There is no significant difference in the distribution of Bilirubin over outcome.

From two sample t test, it is observed that, there is no significant difference in mean HB over outcome.

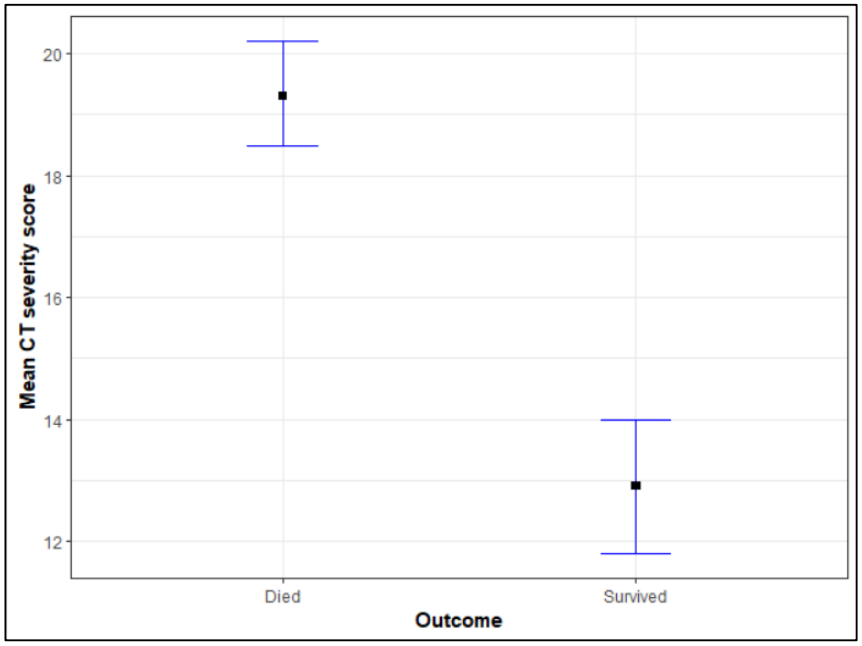

Figure 9: Mean plot of CT severity score over outcome.

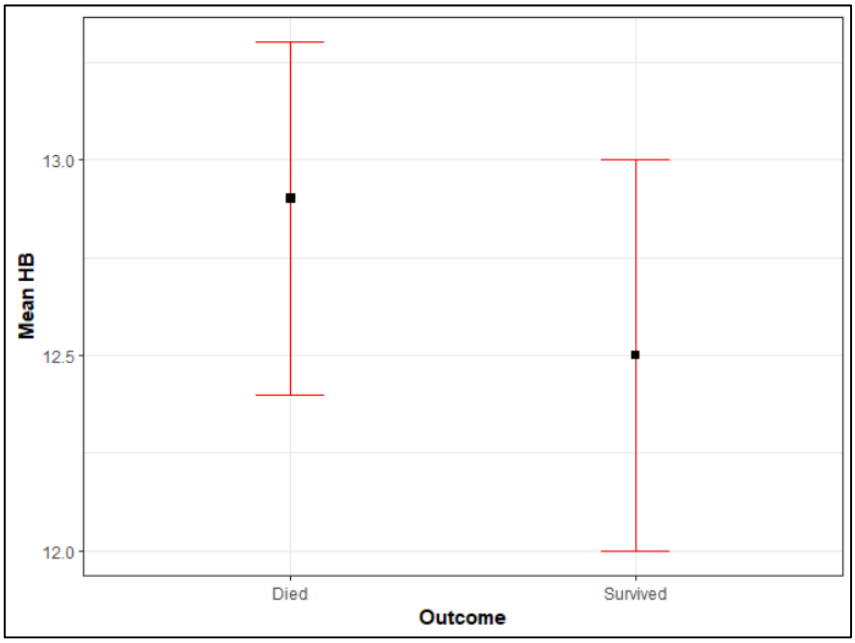

Figure 10: Mean plot of HB over outcome.

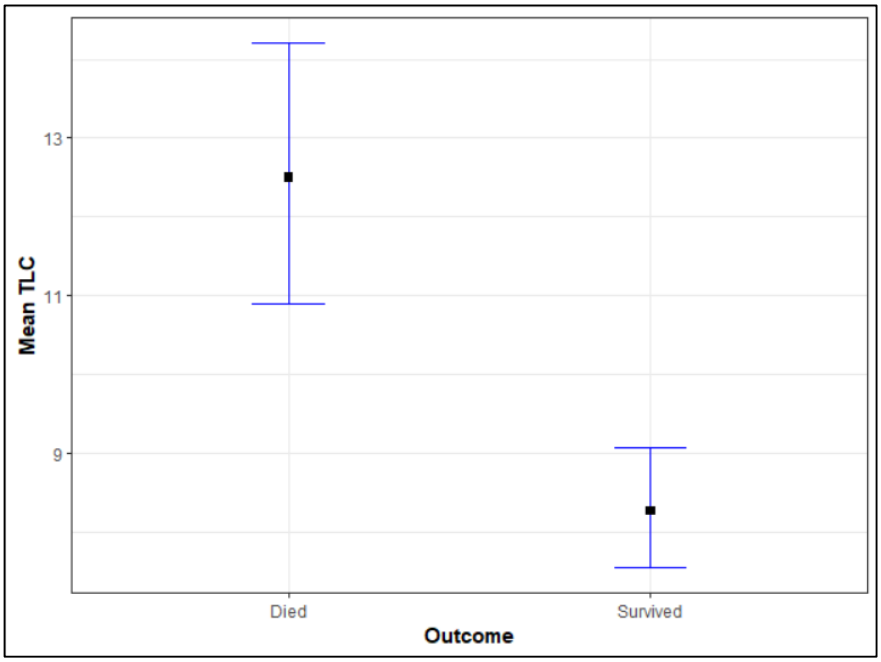

Figure 11: Mean plot of TLC over outcome.

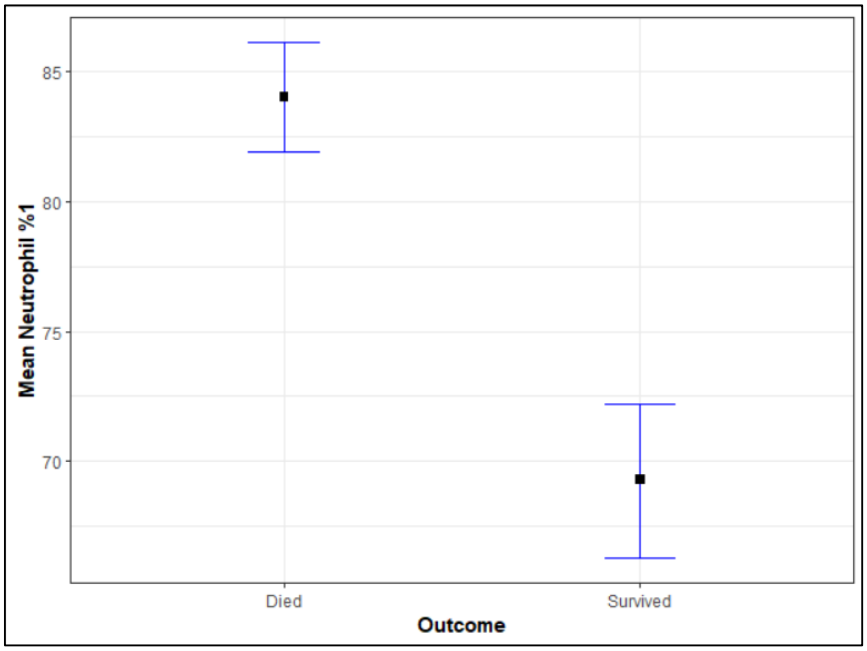

Figure 12: Mean plot of neutrophil over outcome.

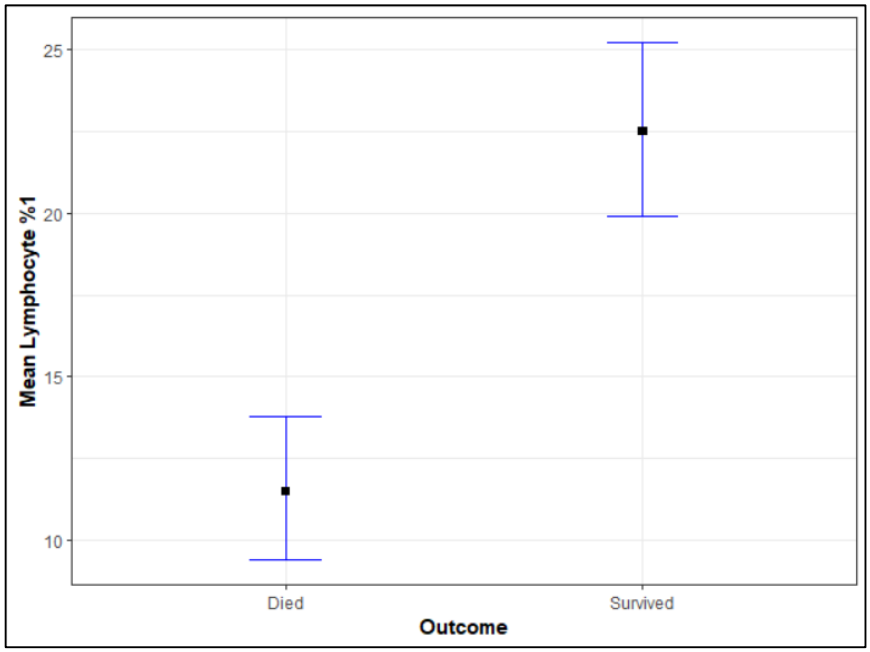

Figure 13: Mean plot of lymphocyte over outcome.

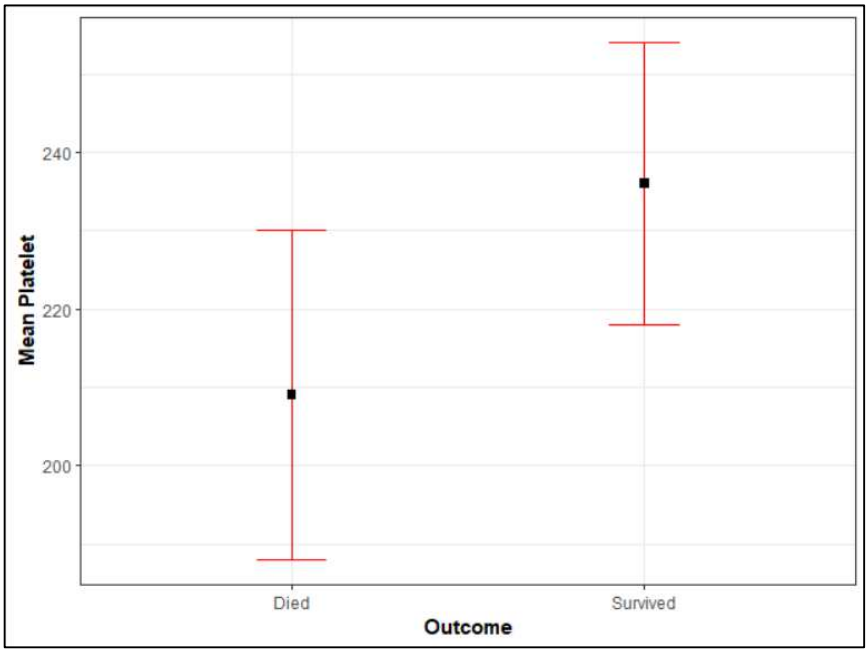

Figure 14: Mean plot of platelet over outcome.

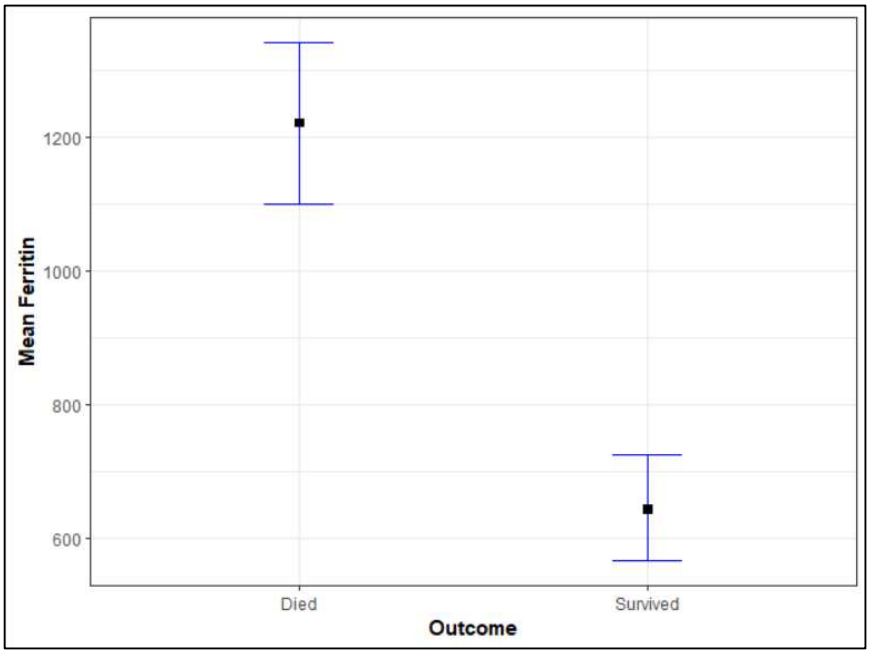

Figure 15: Mean plot of Ferritin over outcome.

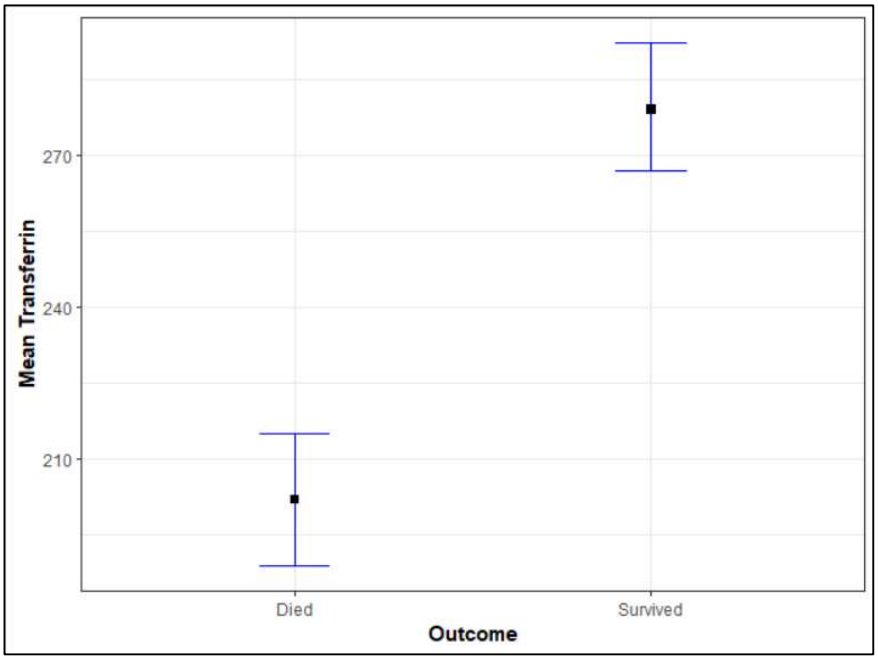

Figure 16: Mean plot of Transferrin over outcome.

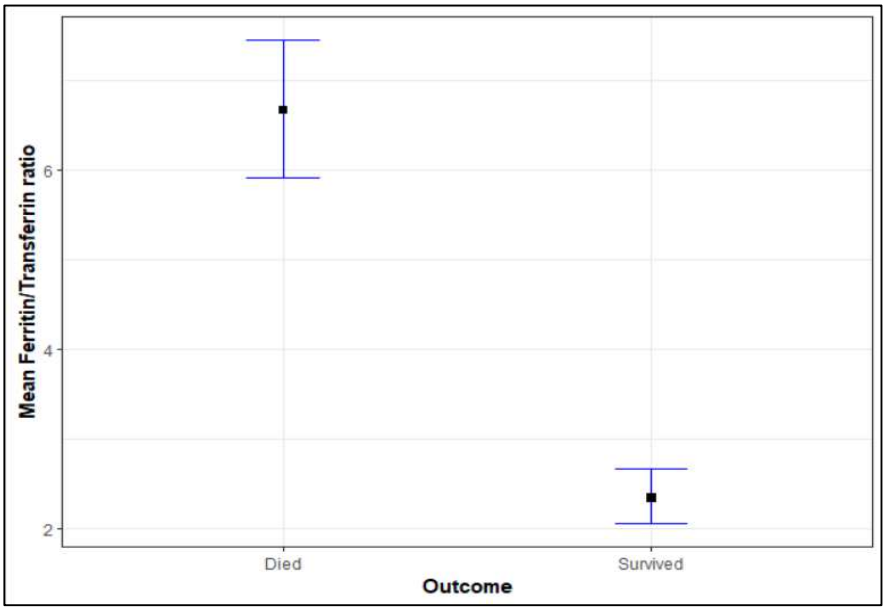

Figure 17: Mean plot of Ferritin/Transferrin ratio over outcome.

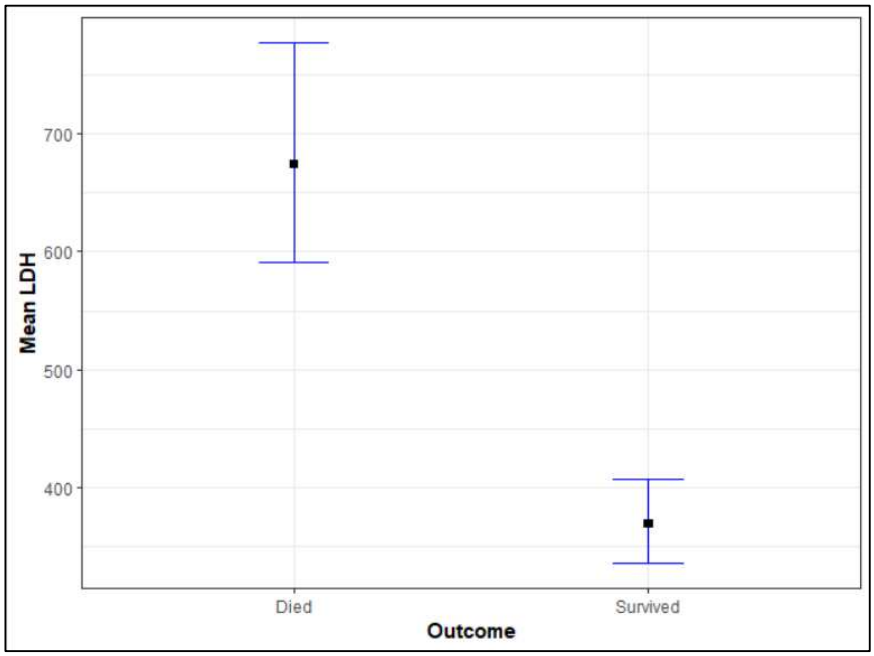

Figure 18: Mean plot of LDH over outcome.

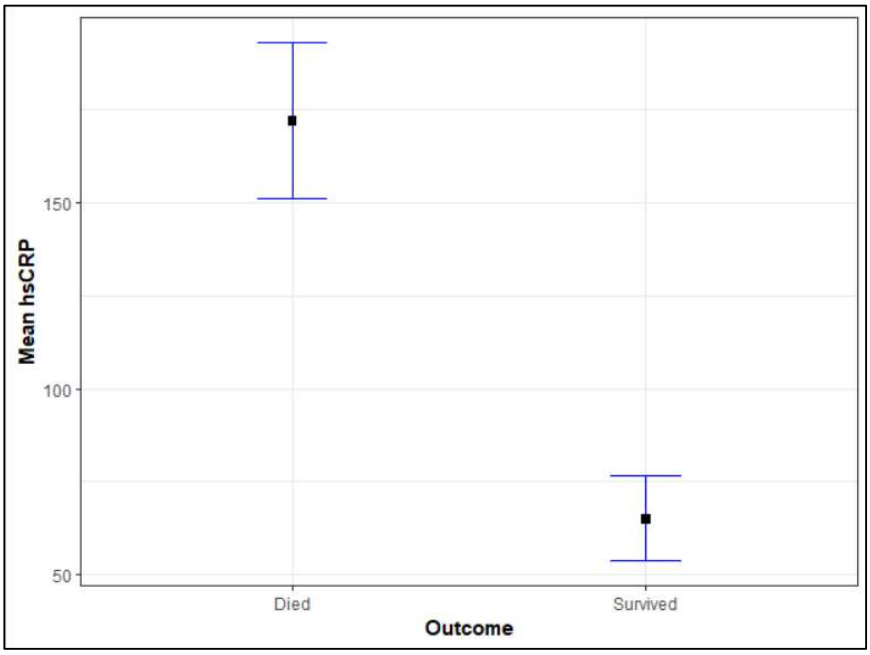

Figure 19: Mean plot of hsCRP over outcome.

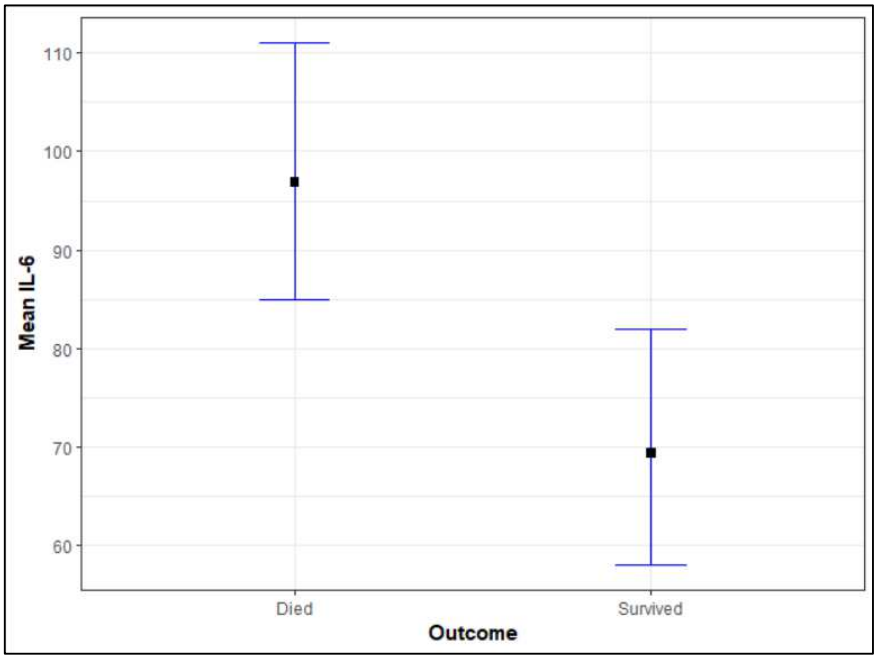

Figure 20: Mean plot of IL-6 over outcome.

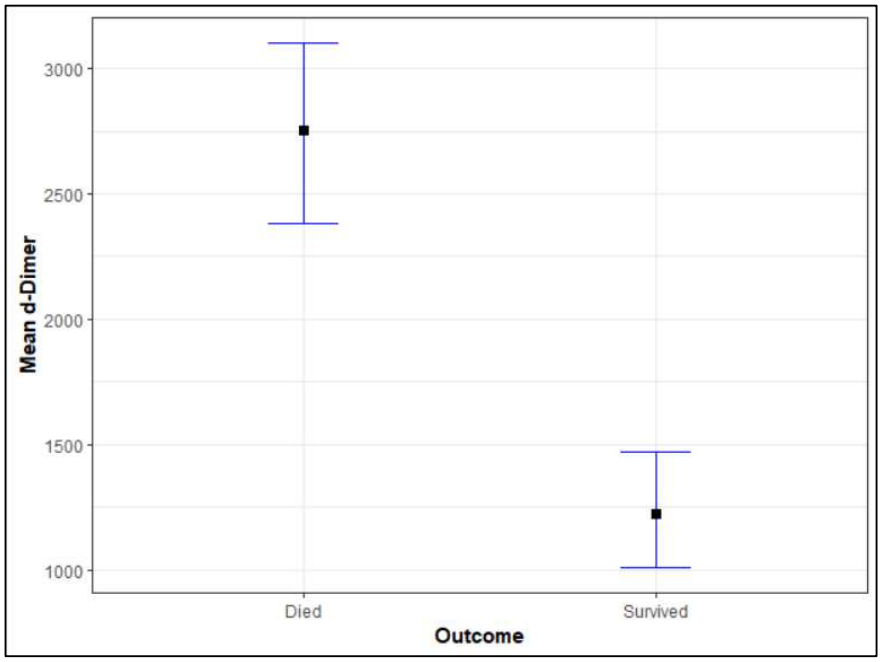

Figure 21: Mean plot of d-Dimer over outcome.

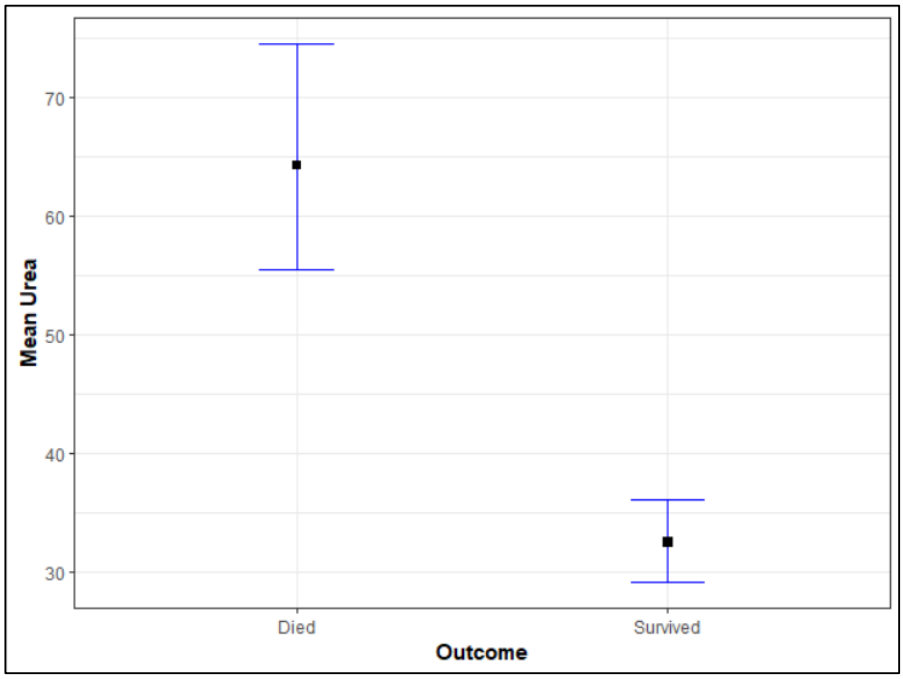

Figure 22: Mean plot of urea over outcome.

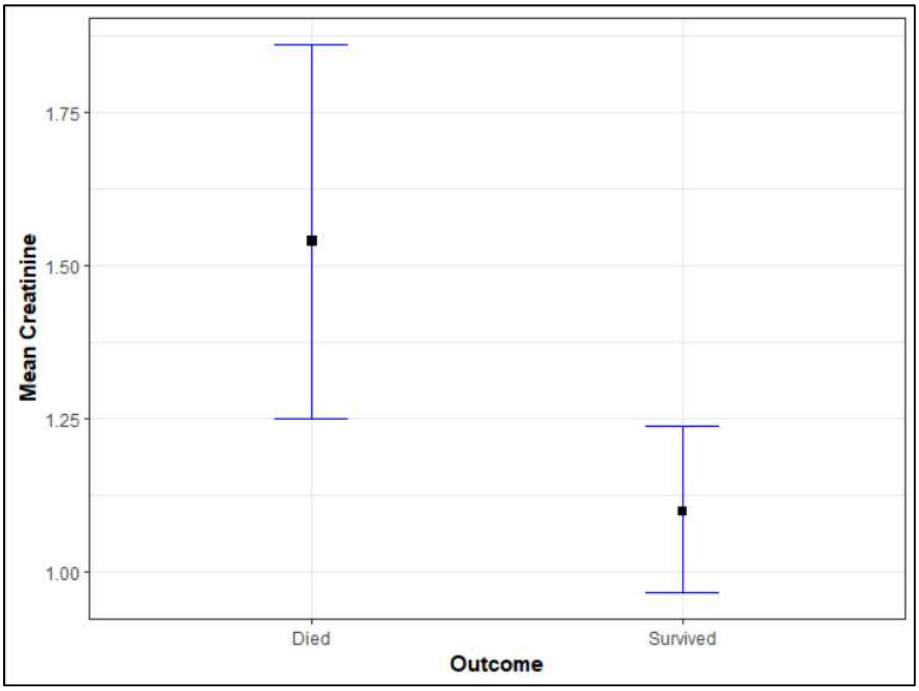

Figure 23: Mean plot of creatinine over outcome.

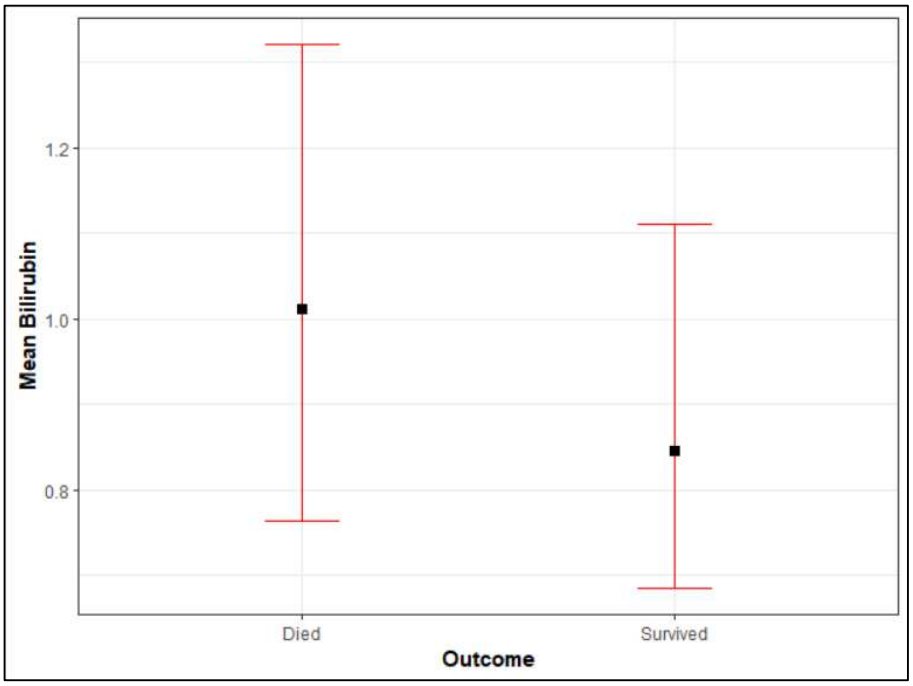

Figure 24: Mean plot of bilirubin over outcome.

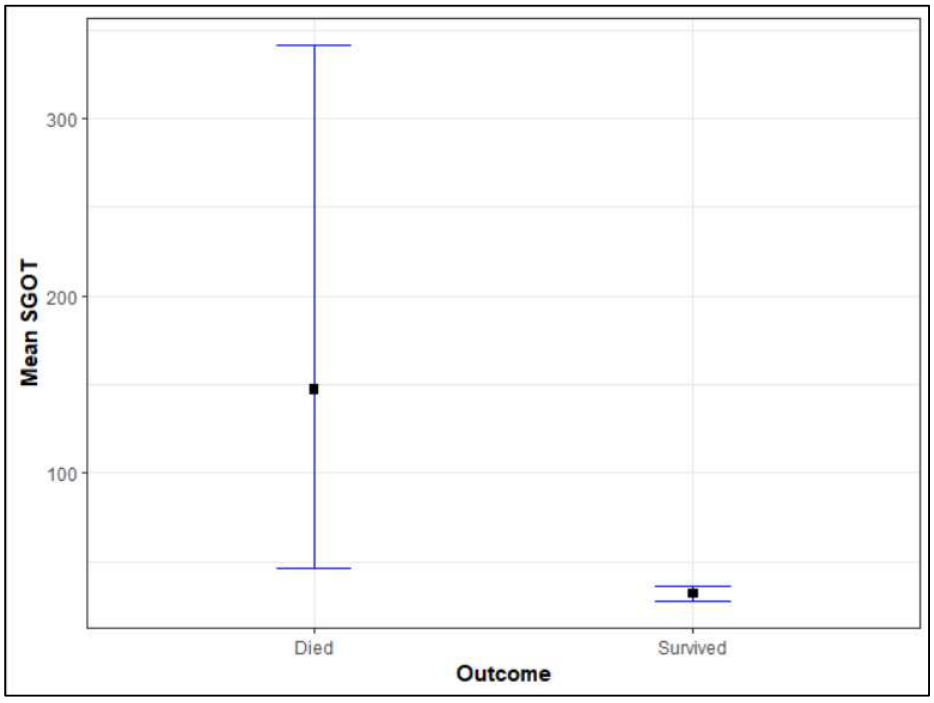

Figure 25: Mean plot of SGOT over outcome.

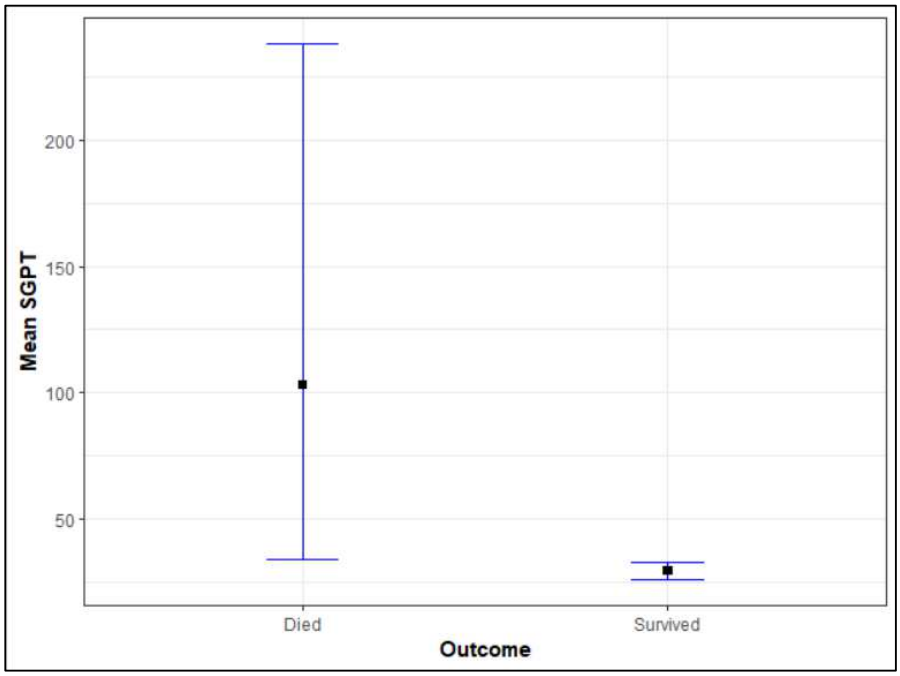

Figure 26: Mean plot of SGPT over outcome.

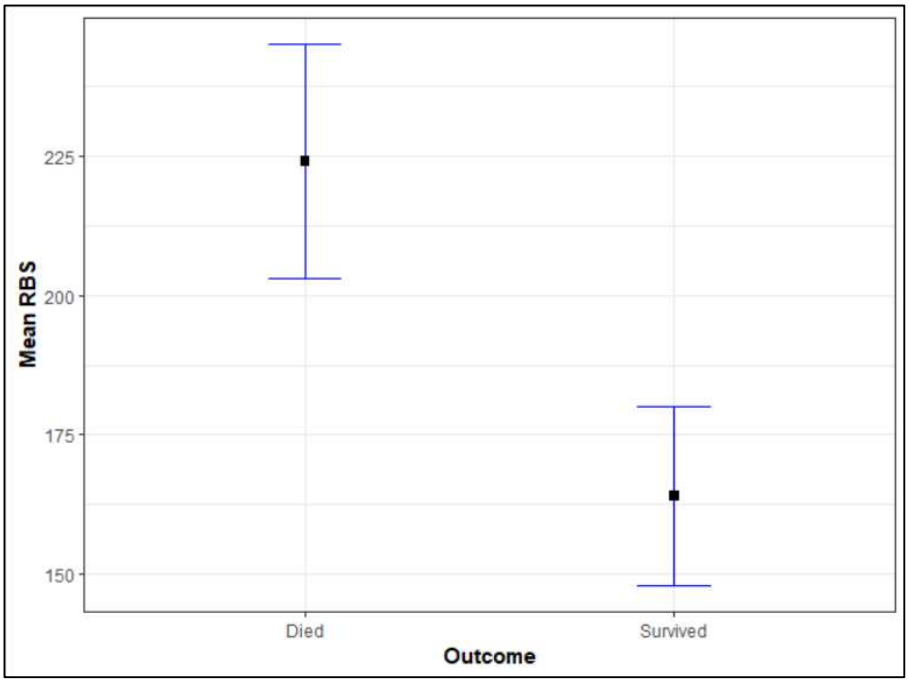

Figure 27: Mean plot of RBS over outcome.

The following table gives the comparison of treatment given over outcome.

Table 11: Comparison of Treatment given over outcome.

Treatment	Sub Category	Outcome		Total	p-value
		Died	**Survived**		
Remdesivir	No	15 (18.07%)	8 (9.88%)	23 (14.02%)	0.1016^{C}
	Yes	66 (79.52%)	75 (92.59%)	141 (85.98%)	
Tocilizumab	No	80 (96.39%)	57 (70.37%)	137 (83.54%)	**< 0.001^{MC}***
	Yes	1 (1.2%)	26 (32.1%)	27 (16.46%)	
Type of Steroid used	Dexamethasone	4 (4.82%)	16 (19.75%)	20 (12.2%)	**0.0090^{MC}***
	Methyl prednisolone	76 (91.57%)	65 (80.25%)	141 (85.98%)	
	Methyl prednisolone, Dexamethasone	1 (1.2%)	0	1 (0.61%)	

*Abbreviation: C – Chi square test, MC – Chi square test with Monte Carlo simulation, * indicates statistical significance.*

From Chi square test, it is observed that, there is significant difference in the distribution of use of Tocilizumab over outcome. There is significant difference in the distribution of steroid used over outcome. There is no significant difference in the distribution of use of Remdesivir over outcomes.

The following table gives the comparison of hospital stay over outcome.

Table 12: Comparison of Hospital Stay over outcome.

Variables	Outcome		Total	p-value
	Died	**Survived**		
Duration of Hospital stay	5.8 ± 4.31 5 (0, 19)	6.35 ± 4.23 6 (1, 24)	6.07 ± 4.27 5 (0, 24)	0.294^{MW}

Abbreviation: MW – Mann Whitney U test.

From Mann Whitney U test, it is observed that, there is no significant difference in the distribution of hospital stay over outcome.

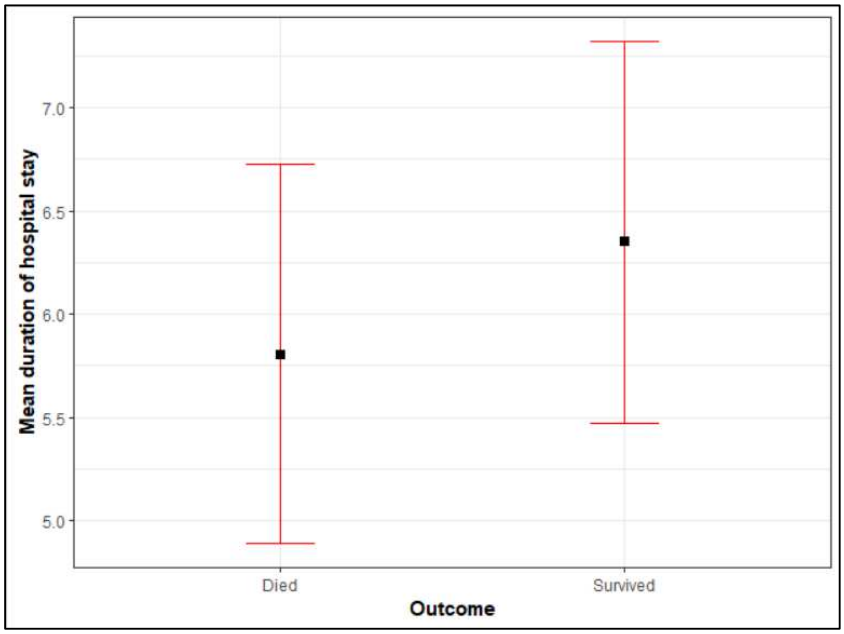

Figure 28: Mean plot of duration of hospital stay over outcome.

The following table gives diagnostic analysis of Ferritin/Transferrin ratio for outcome.

Table 13: Diagnostic analysis of Ferritin/Transferrin ratio for outcome.

	Ferritin/Transferrin ratio
Sensitivity (95% CI)	88.89% (79.95% - 94.79%)
Specificity (95% CI)	83.13% (73.32% - 90.46%)
PPV (95% CI)	83.72% (74.2% - 90.8%)
NPV (95% CI)	88.46% (79.22% - 94.59%)
Accuracy (95% CI)	85.98% (79.7% - 90.9%)
AU-ROC (95% CI)	0.8853 (0.8295 - 0.9412)
p-value	**< 0.001***

*Abbreviation: * indicates statistical significance.*

The AUC for Ferritin/Transferrin ratio is 0.8853 with 88.89% sensitivity and 83.13% specificity in predicting mortality.

From logistic regression, it is observed that, Ferritin/Transferrin ratio has significant effect on mortality (p-value < 0.001). The odds of death increase by 2.24 (95% CI: 1.77 - 2.99) with the unit increase of Ferritin/Transferrin ratio.

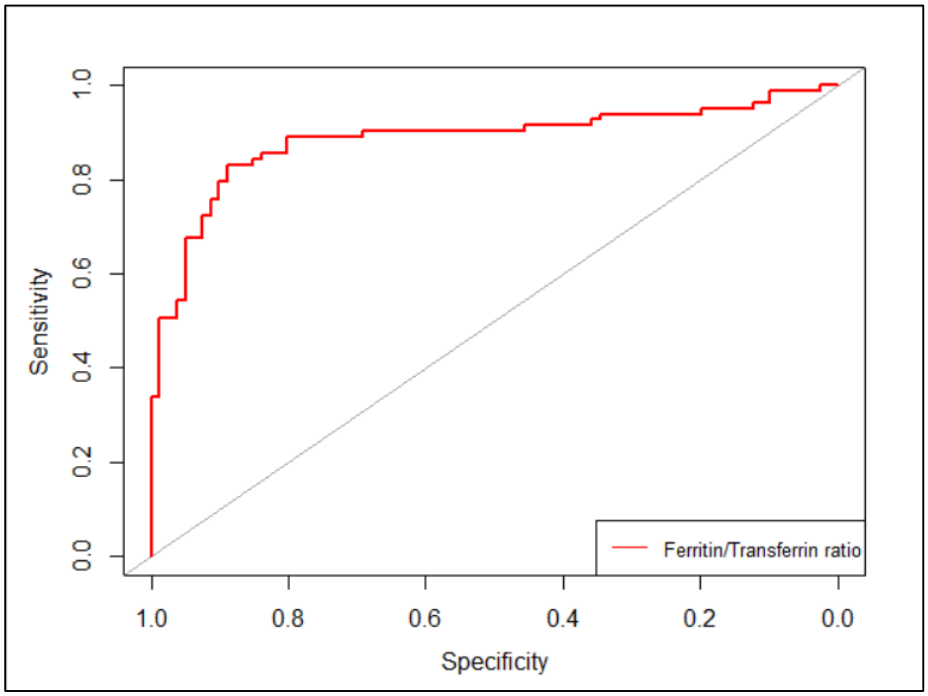

Figure 29: ROC curve of Ferritin/Transferrin ratio for predicting mortality outcome.

DISCUSSION

The expression of transferrin, a known pro-coagulant was upregulated in SARS-CoV-2 infected cells, increased with age and was higher in males than in females. Moreover, a rise of Serum Ferritin levels was observed in patients during COVID-19 disease progression further cementing the link between Iron Profile biomarkers like Transferrin and Ferritin and the pathogenesis and severity of COVID-19 infection. Locally produced Transferrin, independent of circulating Transferrin levels may contribute to COVID-19 pathology. For example, Transferrin is locally produced by neurological tissue like brain and spinal cord and higher levels are associated with an increased incidence of ischemic stroke, haemorrhagic stroke and hypercoagulability. Apart from hypercoagulability which predisposes COVID-19 affected patients to ischemic stroke, Transferrin also causes cytotoxic damage associated with haemorrhagic stroke by increasing cellular uptake of iron. Higher levels of transferrin are also found to be associated with Metabolic syndrome and Diabetes which have shown to exacerbate the severity of COVID-19 disease.[53]

In the present study, a total of 168 patients with COVID-19 were evaluated and the mean age of patients was found to be of 57.35 ± 16.59 years of age in which 84% were male patients and 16% were female patients with male preponderance. In this study, the mean age of the patients with mortality was higher compared to patients which survived. Among the study participants, the gender distribution was comparable between both the groups.

On assessment of days of admission after onset of symptoms to hospital it was found that there was no significant difference in the distribution of time to hospital from symptom onset over outcome. Similarly, there was no significant difference in the distribution of hospital stay over outcome. However, during the analysis of

comparison of symptoms over outcome, it was observed that there was a significant difference in the distribution of breathlessness over the outcome and breathlessness symptom was observed more in cases of subjects which didn't survive, although there was no significant difference in the distribution of other symptoms over outcome. Among the comorbidities, it was observed that there was a significant difference in the distribution of DM and IHD over the outcome. Further, it was noted that the proportion of DM and IHD was more in cases of subjects which didn't survive. There was no significant difference in the distribution of other comorbidity over outcome.

On assessment of the Respiratory rate and the SPO2 on admission, it was observed that there was a significant difference in the distribution of Respiratory rate and SPO2 at admission over outcome. It was noted that the mean Respiratory rate and mean SPO2 on admission was more in subjects which didn't survive.

In a study by Weiler RB et al., it was shown that increased Ferritin/Transferrin ratio was associated with a higher risk for the need of mechanical ventilation and a higher incidence of ICU admission among COVID-19 patients, thus establishing a relation between Iron Profile markers and COVID-19 severity. Studies trying to establish a particular Ferritin/Transferrin ratio have so far been inconclusive although in their study, a Ferritin/Transferrin ratio of more than 10 suggested a higher risk of admission in the ICU and a higher incidence of patients requiring mechanical ventilation with the odds ratio being 5.702 and 8.054 at 95% confidence interval respectively.[3] Reduced serum Transferrin and Iron levels, as well as elevated CRP and Ferritin were substantially linked to COVID-19's heightened inflammatory and immunological status. Therefore, Transferrin, Iron levels, CRP and Serum Ferritin can be utilised as a useful predictor of disease severity and progression.[56]

In this study, it was observed that there was a significant difference in the distribution of CT severity score, TLC, Neutrophil, Lymphocyte, Ferritin, Transferrin, Ferritin/Transferrin ratio, LDH, hsCRP, IL-6, d-Dimer, Urea, Creatinine, SGOT, SGPT and RBS over outcome. However, there was no significant difference in the distribution of Bilirubin over outcome. There were significantly higher neutrophils among the patients of mortality compared to survived and significantly lower lymphocyte and platelet count among the patients which died compared to survived. There was significantly higher Ferritin/Transferrin ratio among the patients with mortality as compared to the patients which survived. Similarly, the mean level of Ferritin was significantly higher and mean Transferrin significantly lower in mortality patients compared to the survived patients. ($p<0.001$)

In the present study there is a significant difference in the distribution of steroid use over outcome. The mean dose of prednisolone and dexamethasone was significantly higher among the patients with mortality compared to the survived patients. There is no significant difference in the distribution of use of Remdesivir over outcomes. In the study, the AUC for Ferritin/Transferrin ratio is 0.8853 with 88.89% sensitivity and 83.13% specificity in predicting mortality. From logistic regression, it was observed that, Ferritin/Transferrin ratio had a significant effect on mortality (p-value < 0.001) with the odds of death increasing by 2.24 (95% CI: 1.77 - 2.99) with every unit increase of Ferritin/Transferrin ratio.

Yanling LV et al. also documented that the risk of Multiple Organ Damage as well as increased severity was seen with patients with a lower level of serum Iron. The findings of this study concluded that the above association between Iron parameters and COVID-19 severity may facilitate the use of Iron parameters as valuable biomarkers for assessing the risk factors and prognosis of COVID-19.[59]

In a study conducted by Bastin A et al., both Iron and Ferritin had a higher AUC for COVID 19 disease prognosis but when it came to disease severity, Serum Ferritin had the highest AUC. This indicated that routine measurement of Serum Iron and Ferritin can help us to determine the prognosis and severity of the disease. Based on the results of the above study, the use of iron chelators to decrease the amount of iron intake can be of significant therapeutic benefit.[55]

CONCLUSION

The present study documented the significant correlation of Ferritin/Transferrin ratio with COVID-19 infection and a higher incidence of mortality among the patients with higher Ferritin, low Transferrin and a significantly higher Ferritin/Transferrin ratio. There is a significant association of mortality among the patients with a higher Ferritin/Transferrin ratio.

SUMMARY

- In the present study, a total of 168 patients with COVID-19 were evaluated in which the mean age of patients was found to be 57.35 ± 16.59 yrs. of age wherein 84% were male patients and 16% were female patients with male preponderance.

- In our analysis, the mean age of the patients with mortality was higher compared to patients which survived.

- Among the study participants, the gender distribution was comparable between both the groups.

- On assessment of days of admission after the onset of symptoms to hospital, it was found that there was no significant difference in the distribution of time to hospital from symptom onset over outcome.

- On assessment of the Respiratory Rate and the SPO2 at admission among the study participants it was observed that there was a significant difference in the distribution of Respiratory Rate and SPO2 at admission over outcome. Further, it can be noted that mean Respiratory Rate and mean SPO2 admission was more in those who didn't survive.

- It was observed that there was a significant difference in the distribution of O2 modalities over the outcome with a higher need of NIV (ventilatory support) among mortality patients.

- In this study, the CT severity score on admission was significantly higher among the patients with mortality as compared to those who survived.

- In our analysis, there were significantly higher neutrophils among the patients of mortality compared to survived and significantly lower lymphocyte and platelet count among the patients which died compared to survived.

- Among the comorbidities, it was observed that, there is a significant difference in the distribution of DM and IHD over the outcome. Further, it can be noted that the proportion of DM and IHD is more in cases of subjects which didn't survive.

- It was observed that, there is significant difference in the distribution of TLC, Neutrophil, Lymphocyte, Ferritin, Transferrin, Ferritin/Transferrin ratio, LDH, hsCRP, IL-6, d-Dimer, Urea, Creatinine, SGOT, SGPT and RBS over outcome. However, there was no significant difference in the distribution of Bilirubin over outcome

- In the present study there is significantly higher Ferritin upon Transferrin ratio among the patients with mortality as compared to patients which survived. Similarly, the mean level of Ferritin was significantly higher and Transferrin was significantly lower in mortality patients as compared to the survived patients. ($p<0.001$)

- In the present study, the mean dose of prednisolone and dexamethasone was significantly higher among the patients with mortality as compared to those which survived.

- In this study, the Area Under Curve (0.8853) for the Ferritin/Transferrin ratio was significantly positively related with the prediction of mortality among the patients (p value <0.001) with a sensitivity of 88.89% (95% CI) and a specificity of 83.13% (95% CI).

Limitation Of the Study

1. The mean age of the population 57.35 ± 16.59 yrs, was towards a higher side with an unequal distribution of sex among the participants wherein 84% were male patients and 16% were female patients with a male preponderance.

2. This was a single center observational study with a limited sample size.

3. The duration of the study was spread over for only one year.

4. There was no discernible method to figure out if the alterations in Iron Profile parameters were caused by preexisting anemia and whether it had any bearing on the final outcome.

Future Perspective

The findings of this study concluded that the above association between Iron parameters and COVID severity may facilitate the use of Iron parameters as valuable biomarkers for assessing the risk factors and prognosis of COVID-19. Future studies are warranted utilizing the predictive models using Serum Ferritin, Serum Transferrin and Ferritin/Transferrin ratio at the time of admission to predict ICU admission, management and prognosis among COVID-19 patients.

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ANNEXURE I

INFORMED CONSENT

Dear Mr./Mrs./Dr. _____, you are kindly requested to enroll yourself in a research study titled, **"To Study the correlation of Ferritin/Transferrin ratio with the severity of COVID-19 infection - A One year Cross Sectional Study done in KLES Dr. Prabhakar Kore Hospital and Medical Research Centre. Belagavi."** being conducted by REG NO: BG0120015, a post graduate student in M.D. General Medicine and the study will be carried out under the direct supervision and guidance of Dr. _____, 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 asked some questions and you are supposed to answer to the best of your knowledge. 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:

"To Study the correlation of Ferritin/Transferrin ratio with the severity of COVID-19 infection - A One year Cross Sectional Study done in KLES Dr. Prabhakar Kore Hospital and Medical Research Centre. Belagavi."

PURPOSE OF THE STUDY: To study the correlation of Ferritin/Transferrin ratio with COVID-19 infection and to assess its predictive value on the severity of the disease.

PROCEDURES INVOLVED:

If you agree to enroll yourself in my study, you will be interviewed regarding your present, past and family history then you will be clinically examined in detail and investigated accordingly.

Then you will be subjected to a few blood investigations, namely complete blood counts, Iron Profile, random blood glucose, renal function tests, liver function tests, urine routine and microscopy, D dimer, LDH, serum ferritin, IL-6, hsCRP.

RISKS AND BENEFITS:

There are no potential risks involved in this study.

Benefits of taking part in this research:

By taking part in this study, correlation between the Iron Profile, especially Ferritin/Transferrin ratio and the severity of the patient suffering from COVID-19 infection can be found out which may serve as a prognostic indicator for predicting the severity of COVID-19 infection.

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, Belagavi. 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 so only after your informed & written 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 and all the cost of study will be borne by the investigator.

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.

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. _____ Chairman, J.N.M.C Ethical Committee for Human Research	2. Dr. _____ Professor and HEAD OF DEPARTMENT, Dept. of General Medicine, JNMC, Belagavi.
3. Dr. _____ Guide, Associate Professor, Dept. of General Medicne, JNMC, Belagavi.	4. REG NO: BG0120015 Investigator, PG in General Medicine, JNMC, Belagavi.

CONSENT FORM

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

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

Participant's name :……...

Signature / Left thumb impression …….

of the participant

Name of the legally authorized :……...

representative / guardian

Signature / Left thumb impression …….

Witness 'name :……...

Signature / Left thumb impression ……..

Investigator's name and signature ……...

Date:

Place:

ತಿಳುವಳಿಕೆಯ ಸಮ್ಮತಿ

ಆತ್ಮೀಯ ಶ್ರೀ / ಶ್ರೀ. / ಡಾ. _____, ಒರೆಯಾಗಿರುವ ಸಂಶೋಧನಾ ಅಧ್ಯಯನಕ್ಕೆ ನಿಮ್ಮನ್ನು ಸೇರಿಸಲು ನಿಮ್ಮನ್ನು ದಯೆಯಿಂದ ವಿನಂತಿಸಲಾಗಿದೆ, "ಕೋವಿಡ್ -19 ಸೋಂಕಿನ ತೀವ್ರತೆಯೊಂದಿಗೆ ಫೆರಿಟಿನ್ / ಟ್ರಾನ್ಸ್‌ಫೆರಿನ್ ಅನುಪಾತದ ಪರಸ್ಪರ ಸಂಬಂಧವನ್ನು ಅಧ್ಯಯನ ಮಾಡಲು - ಕೆಎಲ್ಇಎಸ್ ಡಾ. ಪ್ರಭಾಕರ್ ಕೋರೆ ಆಸ್ಪತ್ರೆ ಮತ್ತು ವೈದ್ಯಕೀಯ ಸಂಶೋಧನಾ ಕೇಂದ್ರದಲ್ಲಿ ಬೆಳಗಾವಿ ಒಂದು ವರ್ಷದ ಕ್ರಾಸ್ ಸೆಕ್ಷನಲ್ ಸ್ಟಡಿ ಮಾಡಲಾಗಿದೆ". ಎಂ.ಡಿ. ಜನರಲ್ ಮೆಡಿಸಿನ್‌ನಲ್ಲಿ ಸ್ನಾತಕೋತ್ತರ ವಿದ್ಯಾರ್ಥಿ REG NO: BG0120015 ಅವರು ನಡೆಸಲಿದ್ದಾರೆ ಮತ್ತು ಬೆಳಗಾವಿನ ಜವಾಹರಲಾಲ್ ನೆಹರು ವೈದ್ಯಕೀಯ ಕಾಲೇಜಿನ ಜನರಲ್ ಮೆಡಿಸಿನ್ ವಿಭಾಗದ ಸಹಾಯಕ ಪ್ರಾಧ್ಯಾಪಕ ಡಾ. _____ ಅವರ ನೇರ ಮೇಲ್ವಿಚಾರಣೆ ಮತ್ತು ಮಾರ್ಗದರ್ಶನದಲ್ಲಿ ಈ ಅಧ್ಯಯನವನ್ನು ನಡೆಸಲಾಗುವುದು.

ಅಧ್ಯಯನದ 'ವಿಷಯ' / ಭಾಗವಹಿಸುವವರಿಗೆ ನೀವು ನಿಗದಿಪಡಿಸಿದ ಮಾನದಂಡಗಳಿಗೆ ಸರಿಹೊಂದುವಂತೆ ಇದರಲ್ಲಿ ಭಾಗವಹಿಸಲು ನಿಮ್ಮನ್ನು ವಿನಂತಿಸಲಾಗಿದೆ.
ಅಧ್ಯಯನದಲ್ಲಿ ನಿಮ್ಮ ಭಾಗವಹಿಸುವಿಕೆ ಸ್ವಯಂಪ್ರೇರಿತವಾಗಿದೆ. ಅಧ್ಯಯನದ ಸಮಯದಲ್ಲಿ ನಿಮ್ಮನ್ನು ಕೆಲವು ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಲಾಗುತ್ತದೆ ಮತ್ತು ನಿಮ್ಮ ಉತ್ತಮ ಜ್ಞಾನಕ್ಕೆ ನೀವು ಉತ್ತರಿಸಬೇಕಾಗುತ್ತದೆ. ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಬೇಕೆ ಅಥವಾ ಬೇಡವೇ ಎಂಬ ನಿಮ್ಮ ನಿರ್ಧಾರವು ನಿಮ್ಮ ಚಿಕಿತ್ಸೆಯ ಮೇಲೆ ಯಾವುದೇ ರೂಪದಲ್ಲಿ ಪರಿಣಾಮ ಬೀರುವುದಿಲ್ಲ. ನೀವು ಭಾಗವಹಿಸಲು ನಿರ್ಧರಿಸಿದರೆ ನೀವು ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಹಿಂತೆಗೆದುಕೊಳ್ಳಬಹುದು.

ಅಧ್ಯಯನದ ಶೀರ್ಷಿಕೆ:"ಕೋವಿಡ್ -19 ಸೋಂಕಿನ ತೀವ್ರತೆಯೊಂದಿಗೆ ಫೆರಿಟಿನ್ / ಟ್ರಾನ್ಸ್‌ಫೆರಿನ್ ಅನುಪಾತದ ಪರಸ್ಪರ ಸಂಬಂಧವನ್ನು ಅಧ್ಯಯನ ಮಾಡಲು - ಕೆಎಲ್ಇಎಸ್ ಡಾ. ಪ್ರಭಾಕರ್ ಕೋರೆ ಆಸ್ಪತ್ರೆ ಮತ್ತು ವೈದ್ಯಕೀಯ ಸಂಶೋಧನಾ ಕೇಂದ್ರದಲ್ಲಿ ಬೆಳಗಾವಿ ಒಂದು ವರ್ಷದ ಕ್ರಾಸ್ ಸೆಕ್ಷನಲ್ ಸ್ಟಡಿ ಮಾಡಲಾಗಿದೆ".

ಅಧ್ಯಯನದ ಉದ್ದೇಶ:

ಕೋವಿಡ್ - 19 ಸೋಂಕಿನೊಂದಿಗೆ ಫೆರಿಟಿನ್ / ಟ್ರಾನ್ಸ್‌ಫೆರಿನ್ ಅನುಪಾತದ ಪರಸ್ಪರ ಸಂಬಂಧವನ್ನು ಅಧ್ಯಯನ ಮಾಡಲು ಮತ್ತು ರೋಗದ ತೀವ್ರತೆಯ ಮೇಲೆ ಅದರ ಮುನ್ಸೂಚಕ ಮೌಲ್ಯವನ್ನು ನಿರ್ಣಯಿಸಲು.

ಒಳಗೊಂಡಿರುವ ಕಾರ್ಯವಿಧಾನಗಳು:

ನನ್ನ ಅಧ್ಯಯನಕ್ಕೆ ನಿಮ್ಮನ್ನು ಸೇರಿಸಲು ನೀವು ಒಪ್ಪಿದರೆ, ನಿಮ್ಮ ಪ್ರಸ್ತುತ, ಹಿಂದಿನ ಮತ್ತು ಕುಟುಂಬದ ಇತಿಹಾಸದ ಬಗ್ಗೆ ನಿಮ್ಮನ್ನು ಸಂದರ್ಶಿಸಲಾಗುವುದು, ನಂತರ ನಿಮ್ಮನ್ನು ಪ್ರಾಯೋಗಿಕವಾಗಿ ವಿವರವಾಗಿ ಪರಿಶೀಲಿಸಲಾಗುತ್ತದೆ ಮತ್ತು ಅದಕ್ಕೆ ಅನುಗುಣವಾಗಿ ತನಿಖೆ ಮಾಡಲಾಗುತ್ತದೆ.
ನಂತರ ನೀವು ಕೆಲವು ರಕ್ತ ತನಿಖೆಗೆ ಒಳಗಾಗುತ್ತೀರಿ, ಅವುಗಳೆಂದರೆ ಸಂಪೂರ್ಣ ರಕ್ತದ ಎಣಿಕೆಗಳು, ಕಬ್ಬಿಣದ ವಿವರ, ಯಾದೃಚ್ಛಿಕ ರಕ್ತದ ಗ್ಲೂಕೋಸ್, ಮೂತ್ರಪಿಂಡದ ಕಾರ್ಯ ಪರೀಕ್ಷೆಗಳು, ಪಿತ್ತಜನಕಾಂಗದ ಕಾರ್ಯ ಪರೀಕ್ಷೆಗಳು, ಮೂತ್ರದ ದಿನಚರಿ ಮತ್ತು ಸೂಕ್ಷ್ಮದರ್ಶಕ, ಡಿ ಡೈಮರ್, ಎಲ್ಡಿಹೆಚ್, ಸೀರಮ್ ಫೆರಿಟಿನ್, ಐಎಲ್ -6, ಎಚ್‌ಎಸ್‌ಸಿಆರ್‌ಪಿ.

ಅಪಾಯ ಮತ್ತು ಪ್ರಯೋಜನಗಳು: ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಯಾವುದೇ ಸಂಭಾವ್ಯ ಅಪಾಯಗಳಿಲ್ಲ.

ಈ ಸಂಶೋಧನೆಯಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳುವ ಪ್ರಯೋಜನಗಳು:

ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳುವ ಮೂಲಕ, ಐರನ್ ಪ್ರೊಫೈಲ್, ವಿಶೇಷವಾಗಿ ಫೆರಿಟಿನ್ / ಟ್ರಾನ್ಸ್‌ಫೆರಿನ್ ಅನುಪಾತ ಮತ್ತು ಕೋವಿಡ್ - 19 ಸೋಂಕಿನಿಂದ ಬಳಲುತ್ತಿರುವ ರೋಗಿಯ ತೀವ್ರತೆಯ ನಡುವಿನ ಪರಸ್ಪರ ಸಂಬಂಧವನ್ನು ಕಂಡುಹಿಡಿಯಬಹುದು, ಇದು ಕೋವಿಡ್ - 19 ಸೋಂಕಿನ ತೀವ್ರತೆಯನ್ನು ಹಿಸಲು ಮುನ್ನರಿವಿನ ಸೂಚಕವಾಗಿ ಕಾರ್ಯನಿರ್ವಹಿಸುತ್ತದೆ.

ಸ್ವಯಂಪ್ರೇರಿತ ಭಾಗವಹಿಸುವಿಕೆ / ಅಧ್ಯಯನದಿಂದ ಹಿಂತೆಗೆದುಕೊಳ್ಳುವಿಕೆ:

ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸುವುದು ಸ್ವಯಂಪ್ರೇರಿತವಾಗಿದೆ. ಈ ಅಧ್ಯಯನಕ್ಕೆ ನಿಮ್ಮನ್ನು ಸೇರಿಸಿಕೊಳ್ಳದಿರಲು ನೀವು ಆಯ್ಕೆ ಮಾಡಬಹುದು ಮತ್ತು ಈ ನಡುವೆ ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಅಧ್ಯಯನವನ್ನು ಬಿಡಲು ಆಯ್ಕೆ ಮಾಡಬಹುದು.

ಪರ್ಯಾಯಗಳು:

ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸುವ ಬಗ್ಗೆ ನಿಮ್ಮ ನಿರ್ಧಾರವು ಕೆಎಲ್‌ಇಎಸ್ ಡಾ. ಪ್ರಭಾಕರ್ ಕೋರೆ ಆಸ್ಪತ್ರೆ ಮತ್ತು ಬೆಳಗಾವಿ ವೈದ್ಯಕೀಯ ಸಂಶೋಧನಾ ಕೇಂದ್ರದಲ್ಲಿ ನಿಮಗೆ ನೀಡುತ್ತಿರುವ ಪ್ರಸ್ತುತ ಅಥವಾ ಭವಿಷ್ಯದ ಆರೋಗ್ಯ ಸೇವೆಗಳನ್ನು ಬದಲಾಯಿಸುವುದಿಲ್ಲ. ನೀವು ಬಯಸಿದರೆ ನಿಮ್ಮನ್ನು ಅಧ್ಯಯನದಿಂದ ಹೊರಗಿಡಲಾಗುವುದು, ಮತ್ತು ನಿಮ್ಮ ಎಲ್ಲಾ ವಿವರಗಳನ್ನು ಗೌಪ್ಯವಾಗಿಡಲಾಗುತ್ತದೆ ಮತ್ತು ನೀವು ವಾಡಿಕೆಯ ನಿರ್ವಹಣೆಯನ್ನು ಪಡೆಯುತ್ತೀರಿ.

ಗೌಪ್ಯತೆ ಮತ್ತು ಗೌಪ್ಯತೆ:

ಅಧ್ಯಯನದ ಭಾಗವಹಿಸುವಿಕೆಯ ಸಮಯದಲ್ಲಿ ನೀವು ಸಂಗ್ರಹಿಸಿದ ಅಥವಾ ಬಹಿರಂಗಪಡಿಸಿದ ಎಲ್ಲಾ ಡೇಟಾವನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ಗೌಪ್ಯವಾಗಿಡಲಾಗುತ್ತದೆ. ಕೋರ್ಸ್ ಸಮಯದಲ್ಲಿ ಪ್ರಗತಿಗೆ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸುವುದು ಅಗತ್ಯವಿದ್ದರೆ, ನಿಮ್ಮ ಮಾಹಿತಿ ಮತ್ತು ಲಿಖಿತ ಒಪ್ಪಿಗೆಯ ನಂತರವೇ ಇದನ್ನು ಮಾಡಲಾಗುತ್ತದೆ.

ನೀವು ಸಂಶೋಧನಾ ವಿಷಯ ಎಂದು ತಿಳಿದುಕೊಳ್ಳುವ ಏಕೈಕ ಜನರು ಸಂಶೋಧನಾ ತಂಡದ ಸದಸ್ಯರು. ನಿಮ್ಮ ಲಿಖಿತ ಅನುಮತಿಯಿಲ್ಲದೆ ನಿಮ್ಮ ಬಗ್ಗೆ ಯಾವುದೇ ಮಾಹಿತಿಯನ್ನು ಇತರರಿಗೆ ಬಹಿರಂಗಪಡಿಸಲಾಗುವುದಿಲ್ಲ:

- ನಿಮ್ಮ ಹಕ್ಕುಗಳು ಮತ್ತು ಕಲ್ಯಾಣವನ್ನು ರಕ್ಷಿಸಲು ತುರ್ತು ಪರಿಸ್ಥಿತಿಯಲ್ಲಿ.
- ಕಾನೂನಿನ ಪ್ರಕಾರ ಅಗತ್ಯವಿದ್ದರೆ.

ಫಲಿತಾಂಶಗಳನ್ನು ಪ್ರಕಟಿಸಲು ಅಧಿಕಾರ:

ಅಧ್ಯಯನದ ಫಲಿತಾಂಶಗಳನ್ನು ಲೇಖನವನ್ನು ಪ್ರಕಟಿಸಲು ಬಳಸಬಹುದು. ಸಂಶೋಧನೆಯ ಫಲಿತಾಂಶಗಳು ಪ್ರಕಟವಾದ ಅಥವಾ ಚರ್ಚಿಸಿದಾಗ, ಸಮ್ಮೇಳನದಲ್ಲಿ, ನಿಮ್ಮ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸುವ ಯಾವುದೇ ಮಾಹಿತಿಯನ್ನು ಪ್ರದರ್ಶಿಸಲಾಗುವುದಿಲ್ಲ. ಈ ಅಧ್ಯಯನಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ಪಡೆದ ಯಾವುದೇ ಮಾಹಿತಿಯು ಮತ್ತು ಅದನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ಗುರುತಿಸಬಹುದು.

ಭಾಗವಹಿಸುವಿಕೆಗೆ ಆರ್ಥಿಕ ಪ್ರೋತ್ಸಾಹ:

ಈ ಅಧ್ಯಯನದ ಉದ್ದೇಶಕ್ಕಾಗಿ ಯಾವುದೇ ಹೆಚ್ಚುವರಿ ವೆಚ್ಚಗಳು ನಿಮ್ಮ ಮೇಲೆ ಆಗುವುದಿಲ್ಲ.

ಇದನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ಸಂಶೋಧನೆಯ ಆಲೋಚನೆಯೊಂದಿಗೆ ಮಾಡಲಾಗುತ್ತಿದೆ ಮತ್ತು ಅಧ್ಯಯನದ ಎಲ್ಲಾ ವೆಚ್ಚವನ್ನು ತನಿಖಾಧಿಕಾರಿ ಭರಿಸುತ್ತಾರೆ.

ಪರಿಹಾರ:

ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಪಾಲ್ಗೊಂಡ ಪರಿಣಾಮವಾಗಿ ನೀವು ಗಾಯಗೊಂಡರೆ ಬೆಳಗಾವಿನ ಕೆಎಲ್ಇಎಸ್ ಡಾ. ಪ್ರಭಾಕರ್ ಕೋರೆ ಆಸ್ಪತ್ರೆ ಮತ್ತು ವೈದ್ಯಕೀಯ ಸಂಶೋಧನಾ ಕೇಂದ್ರದಲ್ಲಿ ನಿಮಗೆ ಚಿಕಿತ್ಸೆ ನೀಡಲಾಗುವುದು ಅಥವಾ ವೈದ್ಯಕೀಯ ಆರೈಕೆಯನ್ನು ಎಲ್ಲಿ ಪಡೆಯಬೇಕು ಎಂಬ ಬಗ್ಗೆ ನಿಮಗೆ ಮಾಹಿತಿ ನೀಡಲಾಗುವುದು. ಆದಾಗ್ಯೂ, ಯಾವುದೇ ಮರುಪಾವತಿ, ಪರಿಹಾರ ಅಥವಾ ಉಚಿತ ವೈದ್ಯಕೀಯ ಸೌಲಭ್ಯವನ್ನು ನೀಡಲಾಗುವುದಿಲ್ಲ.

ಪ್ರಶ್ನೆಗಳು / ಸಂಪರ್ಕ ವಿವರಗಳು:

ನೀವು ಬಯಸಿದಂತೆ ಯಾವುದೇ ಸ್ಪಷ್ಟೀಕರಣ ಅಥವಾ ಸಹಾಯಕ್ಕಾಗಿ ಅಧ್ಯಯನದ ಅವಧಿಯಲ್ಲಿ ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಈ ಕೆಳಗಿನ ಹೆಸರು ಮತ್ತು ವಿಳಾಸಗಳನ್ನು ಸಂಪರ್ಕಿಸಲು ನೀವು ಮುಕ್ತರಾಗಿರಬೇಕು.

ಅಧ್ಯಯನದ ಸಮಯದಲ್ಲಿ ಅಥವಾ ಭವಿಷ್ಯದಲ್ಲಿ ನೀವು ಈ ಕೆಳಗಿನ ವ್ಯಕ್ತಿಗಳನ್ನು ಸಂಪರ್ಕಿಸಬಹುದು,

ಡಾ. _____
ನೈತಿಕ ಸಮಿತಿಯ ಮುಖ್ಯಸ್ಥ
ಮಾನವ ಸಂಶೋಧನೆ ಜೆಎನ್ಎಂಸಿ, ಬೆಳಗಾವಿ.

ಡಾ. _____
ಪ್ರೊಫೆಸರ್, ಮುಖ್ಯಸ್ಥ, ಜನರಲ್ ಮೆಡಿಸಿನ್ ಇಲಾಖೆ,
ಜವಾಹರಲಾಲ್ ನೆಹರು ವೈದ್ಯಕೀಯ ಕಾಲೇಜು,
ಬೆಳಗಾವಿ- 590010.

ಡಾ. _____
ಗೈಡ್, ಸಹಾಯಕ ಪ್ರಾಧ್ಯಾಪಕ,
ಜನರಲ್ ಮೆಡಿಸಿನ್ ಇಲಾಖೆ,
ಜವಾಹರಲಾಲ್ ನೆಹರು ವೈದ್ಯಕೀಯ ಕಾಲೇಜು,
ಬೆಳಗಾವಿ- 590010.

REG NO: BG0120015
ಇನ್ವೆಸ್ಟಿಗೇಟರ್, ಸ್ನಾತಕೋತ್ತರ ವಿದ್ಯಾರ್ಥಿ
ಜನರಲ್ ಮೆಡಿಸಿನ್ ಇಲಾಖೆ,
ಜವಾಹರಲಾಲ್ ನೆಹರು ವೈದ್ಯಕೀಯ ಕಾಲೇಜು,
ಬೆಳಗಾವಿ- 590010.

ಒಪ್ಪಿಗೆ ಪತ್ರ

ಕೆಳಗೆ ಸಹಿ ಮಾಡುವ ಮೂಲಕ ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ನಾನು ಸ್ವಯಂಪ್ರೇರಣೆಯಿಂದ ಒಪ್ಪುತ್ತೇನೆ. ನಾನು ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಹಿಂತೆಗೆದುಕೊಳ್ಳಬಹುದು. ಈ ಫಾರ್ಮ್ಗೆ ಸಹಿ ಮಾಡುವ ಮೂಲಕ ನಾನು ನನ್ನ ಯಾವುದೇ ಕಾನೂನು ಹಕ್ಕುಗಳನ್ನು ಬಿಟ್ಟುಕೊಡುತ್ತಿಲ್ಲ. ಕೆಳಗಿನ ನನ್ನ ಸಹಿ

ನಾನು ಈ ಒಪ್ಪಿಗೆಯ ಫಾರ್ಮ್ ಅನ್ನು ಓದಿದ್ದೇನೆ ಅಥವಾ ಈ ಸಮ್ಮತಿಯ ಫಾರ್ಮ್ ಅನ್ನು ನನಗೆ ಓದಿದ್ದೇನೆ ಮತ್ತು ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿದೆ ಎಂದು ಸೂಚಿಸುತ್ತದೆ

ಭಾಗವಹಿಸುವವರ ಅಥವಾ ಕಾನೂನುಬದ್ಧವಾಗಿ ಅಧಿಕೃತ ಪ್ರತಿನಿಧಿಯ ಸಹಿ / ಎಡ ಹೆಬ್ಬೆರಳು ಮುದ್ರಣ ಭಾಗವಹಿಸುವವರ ಹೆಸರು: ....

ಸಹಿ / ಎಡ ಹೆಬ್ಬೆರಳು ಅನಿಸಿಕೆ: ....

ಭಾಗವಹಿಸುವವರ ಕಾನೂನುಬದ್ಧವಾಗಿ ಅಧಿಕಾರ ಪಡೆದವರ ಹೆಸರು: ....

ಪ್ರತಿನಿಧಿ / ರಕ್ಷಕ ಸಹಿ / ಎಡ ಹೆಬ್ಬೆರಳು ಅನಿಸಿಕೆ: ....

ಸಾಕ್ಷಿ ಹೆಸರು: ....

ಸಹಿ / ಎಡ ಹೆಬ್ಬೆರಳು ಅನಿಸಿಕೆ: ....

ತನಿಖಾಧಿಕಾರಿ ಹೆಸರು ಮತ್ತು ಸಹಿ: ....

ದಿನಾಂಕ:

ಸ್ಥಳ:

माहितीपूर्ण संमती

प्रिय श्रीमती / श्रीमती / डॉ. _____, आपणास विनम्र विनंती आहे की आपणास झुकलेल्या एका संशोधन अभ्यासामध्ये नाव नोंदवावे "कोविड – 19 संसर्गाच्या तीव्रतेसह फेरीटिन / ट्रान्सफरिन रेशोच्या परस्परसंबंधाचा अभ्यास करण्यासाठी - केएलईएस डॉ. प्रभाकर कोरे रुग्णालय व वैद्यकीय संशोधन केंद्रा बेलागावीत केलेला एक वर्षाचा क्रॉस सेक्शनल स्टडी. " REG NO: BG0120015, एम.डी. जनरल मेडिसीन मधील पदव्युत्तर विद्यार्थी घेत आहेत आणि हा अभ्यास, जवाहरलाल नेहरू मेडिकल कॉलेज, बेळगाव

येथील डॉ. _____, सहयोगी प्राध्यापक, सामान्य चिकित्सा विभाग, जवाहरलाल नेहरू मेडिकल कॉलेज, बेळगाव यांच्या थेट देखरेखीखाली आणि मार्गदर्शनानुसार केला जाईल.

आपण अभ्यासाच्या 'विषय' / सहभागीच्या निकषांनुसार बसत असल्यामुळे यामध्ये सहभागी होण्याची विनंती केली गेली आहे.

अभ्यासात आपला सहभाग ऐच्छिक आहे. अभ्यासादरम्यान आपल्याला काही प्रश्न विचारले जातील आणि आपल्या सर्वोत्तम उत्तरासाठी आपल्याला उत्तर द्यावे लागेल. अभ्यासामध्ये भाग घ्यायचा की नाही या निर्णयाचा तुमच्या उपचारांवर कोणत्याही प्रकारचा परिणाम होणार नाही. आपण सहभागी होण्याचे ठरविल्यास आपण कधीही माघार घेण्यास मोकळे आहात.

बेळगावी.

अभ्यासाचे शीर्षकः

"कोविड – 19 संसर्गाच्या तीव्रतेसह फेरीटिन / ट्रान्सफरिन रेशोच्या परस्परसंबंधाचा अभ्यास करण्यासाठी - केएलईएस डॉ. प्रभाकर कोरे रुग्णालय व वैद्यकीय संशोधन केंद्रा बेलागावीत केलेला एक वर्षाचा क्रॉस सेक्शनल स्टडी. "

अभ्यासाचा हेतू:

कोविड -19 संसर्गासह फेरिटिन / ट्रान्सफरिन रेशोच्या परस्परसंबंधाचा अभ्यास करणे आणि रोगाच्या तीव्रतेवर त्याचे भाकित मूल्यांचे मूल्यांकन करणे.

प्रक्रिया समाविष्ट:

माझ्या अभ्यासामध्ये आपण स्वतःस नावनोंदणी घेण्यास सहमत असल्यास, आपल्यास आपल्या वर्तमान, भूतकाळाच्या आणि कौटुंबिक इतिहासाच्या संदर्भात मुलाखत दिली जाईल, त्यानंतर आपणास वैद्यकीयदृष्ट्या तपशीलवार तपासणी केली जाईल आणि त्यानुसार चौकशी केली जाईल.

त्यानंतर आपल्यास काही रक्त तपासणी, अर्थात संपूर्ण रक्ताची संख्या, लोह प्रोफाइल, यादृच्छिक रक्तातील ग्लूकोज, रेनल फंक्शन टेस्ट, यकृत कार्य चाचण्या, लघवीचे दिनचर्या आणि मायक्रोस्कोपी, डी डायमर, एलडीएच, सीरम फेरीटिन, आयएल -6, एचएससीआरपी असे विषय असतील.

जोखीम आणि फायदे:

या अभ्यासामध्ये कोणतेही संभाव्य धोके गुंतलेले नाहीत.

या संशोधनात भाग घेण्याचे फायदेः

या अभ्यासामध्ये भाग घेऊन, लोह प्रोफाइल, विशेषत: फेरीटिन / ट्रान्सफरिन प्रमाण आणि कोविड -19 संक्रमणामुळे ग्रस्त झालेल्या रुग्णाची तीव्रता यांच्यात परस्परसंबंध आढळला की कोविड -19 संसर्गाच्या तीव्रतेचा अंदाज लावण्यासाठी रोगनिदान सूचक म्हणून काम करू शकते.

ऐच्छिक सहभाग / अभ्यासामधून पैसे काढणे :

अभ्यासामध्ये भाग घेणे ऐच्छिक आहे. आपण या अभ्यासामध्ये स्वत: ची नावनोंदणी न करणे निवडू शकता आणि दरम्यान अभ्यास कधीही सोडणे निवडू शकता.

विकल्प:

अभ्यासात सहभागासंदर्भातील तुमचा निर्णय केएलईएस डॉ. प्रभाकर कोरे हॉस्पिटल आणि वैद्यकीय संशोधन केंद्र, बेळगाव येथे तुम्हाला देऊ केलेल्या सध्याच्या किंवा भविष्यातील आरोग्य सेवा बदलणार नाही. आपली इच्छा असेल तर आपल्याला अभ्यासापासून वगळले जाईल आणि आपले सर्व तपशील गोपनीय ठेवले जातील आणि आपल्याला व्यवस्थापनाची नियमित रूंदी मिळेल.

गोपनीयता आणि गोपनीयता :

अभ्यासाच्या सहभागादरम्यान आपण गोळा केलेला किंवा जाहीर केलेला सर्व डेटा पूर्णपणे गोपनीय ठेवला जाईल. अर्थात कोर्सच्या दरम्यान ओळख जाहीर करणे आवश्यक झाले तर ते तुमच्या माहिती व लेखी संमतीनंतरच केले जाईल.

आपण संशोधन विषय आहात हे फक्त लोकांनाच माहित आहे की ते संशोधन पथकाचे सदस्य आहेत. आपल्या लेखी परवानगीशिवाय इतर आपल्याबद्दल कोणतीही माहिती उघड केली जाणार नाही:

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

निकाल प्रकाशित करण्यासाठी अधिकृतता:

अभ्यासाचा निकाल लेख प्रकाशित करण्यासाठी वापरला जाऊ शकतो. जेव्हा एखाद्या संशोधनाचे निकाल कॉन्फरन्समध्ये प्रकाशित केले जातात किंवा त्यावर चर्चा केली जाते तेव्हा आपली ओळख उघडकीस आणणारी कोणतीही माहिती दर्शविली जाणार नाही. या अभ्यासाच्या संदर्भात प्राप्त केलेली कोणतीही माहिती आणि ती आपल्याशी ओळखली जाऊ शकते ती गोपनीय राहील.

सहभागासाठी आर्थिक प्रोत्साहन :

या अभ्यासाच्या हेतूने आपल्यावर कोणत्याही प्रकारची अतिरिक्त किंमत आकारली जाणार नाही.

हे निव्वळ संशोधनाच्या कल्पनेने केले जात आहे आणि अभ्यासाचा सर्व खर्च तपासनीस करेल.

भरपाई :

या अभ्यासामध्ये भाग घेतल्यामुळे आपण जखमी झाल्यास, केएलईएस डॉ. प्रभाकर कोरे हॉस्पिटल आणि मेडिकल रिसर्च सेंटर, बेळगाव येथे तुम्हाला उपचार देण्यात येतील किंवा तुम्हाला वैद्यकीय सेवा कोठून घ्यावी याविषयी माहिती दिली जाईल. तथापि, कोणतेही प्रतिपूर्ती, भरपाई किंवा विनामूल्य वैद्यकीय सेवा दिली जाणार नाही.

प्रश्न / संपर्क तपशील:

अभ्यासाच्या कालावधीत कोणत्याही स्पष्टीकरणासाठी किंवा तुम्हाला पाहिजे असलेल्या मदतीसाठी तुम्ही खाली नमूद केलेल्या नावाने व पत्त्यांशी कधीही संपर्क साधू शकता.

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

डॉ. _____

अध्यक्ष, नैतिक समिती मानव संशोधन
जे.एन.एम.सी, बेळगावी.

डॉ. _____

प्राध्यापक, प्रमुख, सामान्य औषध विभाग,
जवाहरलाल नेहरू मेडिकल कॉलेज, बेळगाव

डॉ._____

मार्गदर्शन, सहयोगी प्राध्यापक,
सामान्य औषध विभाग,
जवाहरलाल नेहरू मेडिकल कॉलेज, बेळगाव

REG NO: BG0120015
अन्वेषक, पदव्युत्तर विद्यार्थी
सामान्य औषध विभाग,
जवाहरलाल नेहरू मेडिकल कॉलेज, बेळगाव.

संमती फॉर्म

मी खाली स्वाक्षरी करून या अभ्यासात भाग घेण्यास स्वेच्छेने सहमत आहे. मी कधीही माघार घेऊ शकतो. या फॉर्मवर सही करून मी माझा कोणताही कायदेशीर हक्क सोडत नाही. खाली माझी स्वाक्षरी सूचित करते की मी हा संमती फॉर्म वाचला आहे किंवा हा संमती फॉर्म मला वाचला आहे आणि मला सर्व प्रश्नांची उत्तरे दिली आहेत

सहभागी किंवा कायदेशीररित्या अधिकृत प्रतिनिधीची सही / डावा अंगठा प्रिंट

सहभागीचे नाव: ....

स्वाक्षरी / डावा अंगठा ठसा: ....

सहभागीचा

कायदेशीररीत्या अधिकृत नाव: ....

प्रतिनिधी / पालक

स्वाक्षरी / डावा अंगठा ठसा: ....

साक्षीचे नाव: ....

स्वाक्षरी / डावा अंगठा ठसा: ....

अन्वेषकांचे नाव आणि स्वाक्षरीः ....

तारीख:

ठिकाणः

सूचित सहमति

प्रिय श्री / श्रीमती / डॉ। _____, आपसे विनम्र अनुरोध है कि आप स्वयं को एक शोध अध्ययन में नामांकित करें, " कोविड -19 संक्रमण की गंभीरता के साथ फेरिटिन / ट्रांसफरिन अनुपात के सहसंबंध का अध्ययन करने के लिए - केएलईएस डॉ. प्रभाकर कोरे अस्पताल और चिकित्सा अनुसंधान केंद्र बेलगावी में किया गया एक साल का क्रॉस सेक्शनल अध्ययन." एमडी जनरल मेडिसिन में स्नातकोत्तर छात्र REG NO: BG0120015 द्वारा संचालित किया जा रहा है और यह अध्ययन डॉ. _____,

सहयोगी प्राध्यापक, जनरल मेडिसिन विभाग, जवाहरलाल नेहरू मेडिकल कॉलेज, बेलगाम के प्रत्यक्ष पर्यवेक्षण और मार्गदर्शन में किया जाएगा।

आपसे यह अनुरोध किया गया है कि आप इसमें एक अध्ययन 'विषय' / प्रतिभागी के निर्धारित मानदंडों में फिट हों।

अध्ययन में आपकी भागीदारी स्वैच्छिक है। अध्ययन के दौरान आपसे कुछ प्रश्न पूछे जाएंगे और आप अपने ज्ञान का सबसे अच्छा जवाब देने वाले हैं। 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 शीर्षक :

" कोविड -19 संक्रमण की गंभीरता के साथ फेरिटिन / ट्रांसफरिन अनुपात के सहसंबंध का अध्ययन करने के लिए - केएलईएस डॉ. प्रभाकर कोरे अस्पताल और चिकित्सा अनुसंधान केंद्र बेलगावी में किया गया एक साल का क्रॉस सेक्शनल अध्ययन."

अध्ययन का उद्देश्य:

कोविड -19 संक्रमण के साथ फेरिटिन / ट्रांसफ़रिन अनुपात के सहसंबंध का अध्ययन करना और बीमारी की गंभीरता पर इसके अनुमानित मूल्य का आकलन करना।

शामिल प्रक्रियाएं :

यदि आप मेरे अध्ययन में खुद को नामांकित करने के लिए सहमत हैं, तो आपको अपने वर्तमान, अतीत और परिवार के इतिहास के बारे में साक्षात्कार दिया जाएगा, फिर आपकी चिकित्सकीय जांच की जाएगी और तदनुसार जांच की जाएगी।

फिर आपको कुछ रक्त जांचों, अर्थात् पूर्ण रक्त गणना, आयरन प्रोफाइल, यादृच्छिक रक्त ग्लूकोज, गुर्दे समारोह परीक्षण, यकृत समारोह परीक्षण, मूत्र दिनचर्या और माइक्रोस्कोपी, डी डिमर, एलडीएच, सीरम फेरिटिन, आईएल -6, एचएससीआरपी के अधीन किया जाएगा।

जोखिम और लाभ:

इस अध्ययन में कोई संभावित जोखिम शामिल नहीं हैं।

इस शोध में भाग लेने के लाभ:

इस अध्ययन में भाग लेने से, आयरन प्रोफाइल, विशेष रूप से फेरिटिन / ट्रांसफरिन अनुपात और कोविड -19 संक्रमण से पीड़ित रोगी की गंभीरता के बीच सहसंबंध पाया जा सकता है जो कोविड -19 संक्रमण की गंभीरता का अनुमान लगाने के लिए एक रोगसूचक संकेतक के रूप में काम कर सकता है.

अध्ययन से स्वैच्छिक भागीदारी / निकासी :

अध्ययन में भाग लेना स्वैच्छिक है। आप इस अध्ययन में खुद को नामांकित नहीं करना चुन सकते हैं और बीच में कभी भी अध्ययन छोड़ने का विकल्प चुन सकते हैं।

विकल्पः

अध्ययन में भाग लेने के बारे में आपका निर्णय के एल ई एस डॉ। प्रभाकर कोरे अस्पताल और चिकित्सा अनुसंधान केंद्र, बेलगाम में आपके लिए पेश की गई वर्तमान या भविष्य की स्वास्थ्य देखभाल सेवाओं को नहीं बदलेगा। यदि आप चाहें, तो आपको अध्ययन से बाहर रखा जाएगा और आपके सभी विवरणों को गोपनीय रखा जाएगा और आपको प्रबंधन की नियमित लाइन मिल जाएगी।

गोपनीयता और गोपनीयता :

अध्ययन की भागीदारी के दौरान आपके द्वारा एकत्र या प्रकट किए गए सभी डेटा को पूरी तरह से गोपनीय रखा जाएगा। हालांकि यदि पाठ्यक्रम के दौरान यह आवश्यक है कि पाठ्यक्रम की प्रगति के लिए पहचान का खुलासा करना आवश्यक है, तो यह आपकी सूचना और लिखित सहमति के बाद ही किया जाएगा।
केवल यह जानने के लिए कि आप एक शोध विषय हैं, अनुसंधान टीम के सदस्य हैं। आपके लिखित अनुमति के बिना आपके बारे में कोई भी जानकारी का खुलासा नहीं किया जाएगा :

- अपने अधिकारों और कल्याण की रक्षा के लिए आपातकाल में।
- यदि कानून द्वारा आवश्यक हो।

परिणाम प्रकाशित करने के लिए प्राधिकरण :

अध्ययन के परिणामों का उपयोग एक लेख प्रकाशित करने के लिए किया जा सकता है। जब एक सम्मेलन में प्रकाशित या चर्चा की गई शोध के परिणाम, कोई भी जानकारी प्रदर्शित नहीं की जाएगी जो आपकी पहचान का खुलासा करेगी। इस अध्ययन के संबंध में प्राप्त की गई कोई भी जानकारी और जिसे आप के साथ पहचाना जा सकता है, गोपनीय रहेगी।

भागीदारी के लिए वित्तीय प्रोत्साहन :

इस अध्ययन के उद्देश्य से आपके ऊपर कोई अतिरिक्त लागत नहीं लगेगी।
यह विशुद्ध रूप से अनुसंधान के विचार के साथ किया जा रहा है और अध्ययन का सारा खर्च अन्वेषक द्वारा वहन किया जाएगा।

भरपाई :

इस अध्ययन में भाग लेने के परिणामस्वरूप आप घायल हो जाते हैं, तो केएलईएस डॉ। प्रभाकर कोरे अस्पताल और चिकित्सा अनुसंधान केंद्र, बेलगाम में उपचार की पेशकश की जाएगी, या आपको चिकित्सा देखभाल कहाँ प्राप्त होगी, इसके बारे में जानकारी दी जाएगी। हालांकि, कोई प्रतिपूर्ति, मुआवजा या मुफ्त चिकित्सा देखभाल नहीं दी जाएगी।

प्रश्न / संपर्क विवरण :

आप किसी भी स्पष्टीकरण या मदद के लिए अध्ययन अवधि के दौरान किसी भी समय नीचे दिए गए नाम और पते से संपर्क करने के लिए स्वतंत्र हो सकते हैं।

अध्ययन के दौरान या भविष्य में प्रश्नों के मामले में आप निम्नलिखित व्यक्तियों से संपर्क कर सकते हैं,

डॉ. _____

अध्यक्ष,नैतिक समिती मानव संशोधन
जे.एन.एम.सी, बेळगावी.

डॉ. _____

प्रोफेसर प्रमुख, सामान्य चिकित्सा विभाग,
जवाहरलाल नेहरू मेडिकल कॉलेज,
नेहरू नगर, केएलई अस्पताल,बेलगाम

डॉ._____

मार्गदर्शक, सहयोगी प्राध्यापक,
नेहरू नगर, केएलई अस्पताल,बेलगाम

REG NO: BG0120015
अन्वेषक,स्नातकोत्तर छात्र
सामान्य चिकित्सा विभाग,
जवाहरलाल नेहरू मेडिकल कॉलेज,बेलगाम

सहमति पत्र

मैं स्वेच्छा से नीचे हस्ताक्षर करके इस अध्ययन में भाग लेने के लिए सहमत हूं। मैं किसी भी समय वापस ले सकता हूं। मैं इस फॉर्म पर हस्ताक्षर करके अपने किसी भी कानूनी अधिकार को नहीं छोड़ रहा हूं। नीचे दिए गए मेरे हस्ताक्षर से संकेत मिलता है कि मैंने इस सहमति फॉर्म को पढ़ा है, या यह मेरे लिए पढ़ा गया है, यह सहमति फॉर्म और उत्तर दिए गए प्रश्नों के उत्तर हैं

तिभागी या कानूनी रूप से अधिकृत प्रतिनिधि का हस्ताक्षर / बायाँ अंगूठा प्रिंट

प्रतिभागी का नाम: ....।

हस्ताक्षर / बाएं अंगूठे का निशान: ....।
प्रतिभागी का

कानूनी रूप से अधिकृत का नाम: ....।
प्रतिनिधि / अभिभावक

हस्ताक्षर / बाएं अंगूठे का निशान: ....।

साक्षी का नाम: ....।

हस्ताक्षर / बाएं अंगूठे का निशान: ....।

अन्वेषक का नाम और हस्ताक्षर: ....।

दिनांक:

जगह:

ANNEXURE - II - PROFORMA

DEMOGRAPHY

IP No :
Date of Admission :
Age :
Sex :

Clinical Parameters At Admission

Symptoms:

Tick the applicable Box					
Cough		Fever		Other Symptoms	
Myalgia		Breathlessness			
Time to hospital from symptom onset (Days)					

Oxygenation Parameters at admission	
Admission Respiratory rate (RR/min)	
Admission SPO2(%)	
Admission O2 modality (RBM,HFO,NIV, Ventilator)	
Admission O2 rate (in Litres per minute)	
Admission O2 FiO2 (%)	
Admission PO2 (Look at admission ABG)	

Co-morbidities

DM		HTN		IHD		CKD		CLD		CVA		Malignancy	
Others													

Lab Parameters At Admission

Hb		TLC		Lymphocyte%		Platelets	
Ferritin		LDH		hsCRP			
d-Dimer		CRP		Fibrinogen		Urea	
Creatinine		Bilirubin		SGOT		SGPT	
RBS		HbA1c					

CT Severity score (Out of 25)	

Maximum OXYGENATION Support required during entire stay	
Mode of O2 (RBM,HFO,NIV, Ventilator)	
FiO2%	
SpO2 %	

PO2% (Look at ABG)	

Ferritin, Transferrin and Ferritin/Transferrin Ratio on Admission	
Serum Ferritin	
Serum Transferrin	
Ferritin/Transferrin Ratio	

TREATMENT

Remdesivir (No. of Doses)	
Tocilizumab (No. of Doses)	
LMWH (Max Dose)	
Un-fractioned Heparin (Max Dose)	
Type of Steroid used (methyle pred or dexa)	
Max dose of steroid per day used	
Thymosin 1 Alpha (No of doses)	
Convalescent Plasma (Cycles)	
PO2/FiO2 at the time of convalescent plasma	
Mode of O2 at the time of plasma therapy	
Cytosob (Cycles)	
Plasma Exchange (Cycles)	
Alteplase (Dose)	
Alteplase (tPA)(Number of times Given)	
Pre tPA PO2/FiO2	
Post tPA pO2/FiO2	
Pre tPA Fibrinogen	
Post tPA Fibrinogen	
Pre tPA d-Dimer	
Post tPA D-dimer	

OUTCOME

Outcome	Tick	Date
Improved and discharged		
Died		
Worsened and went AMA		
Improved and went AMA		

					CLINICAL PARAMETERS AT Admission															INFAMMATORY PARAMETERS AT Admission														
Sl. No.	IP No	Date of Admission	Age	Sex	Symptoms (C=cough; F=Fever; B=breathlessness; M=Myalgia, Loss of smell=LS; Loss of taste=LT)	Any other symptoms	Time to hospital from symptom onset (Days)	Admission Respiratory rate (RR/min)	Admission SPO2	Admission O2 modality (O2 mask, RBM,HFO, NIV, Ventilator)	Admission O2 rate (Lt/min)	Admission FiO2	Co-morbidities	CT severity score(~/25)	DATE OF INV #1	DATE OF INV #2	DATE OF INV #3	DATE OF INV #4	Hb 1	Hb2	Hb 5(mention date)	TLC1	TLC2	TLC3	NEUTROPHIL %1	NEUTORPHIL %2	NEUTROPHIL %3	Lymhocyte % 1	Lymphocyte % 2	Lymphocyte % 3	Platelets 1	Platelets 2	Platelets 3	Ferritin 1	Transferrin	Ferritin/Transferrin Ratio
1	1024932	07-10-20	49	M	C,F		5	26	85%	O2 MASK	5 L/min	NA	ASTHMA	9	7-10-20				13.5			6.7			77			19			122			651	250	2.60
2	1023058	13/9/20	74	M	CFMB		5	22	91%	RA	NA	NA	BPH	12	13-09-2020				12.4			9.8			79			15			174			267	228	1.17
3	1021470	21/8/20	48	F	FB		4	18	96%	RA	NA	NA	NONE	15	21/08/20				11.4			5.1			62			33			289			44.6	254	0.18
4	1024346	30/9/20	78	M	CFMB		2	22	88%	O2 MASK	5L	NA	DM	12	30/09/20				13.1			21.6			94			3			174			1115	280	3.98
5	1024283	29/9/20	72	M	FB		1	16	99%	RA	NA	NA	DM	5	29-09-2020				10.3			9			73			18			274			316.4	210	1.51
6	1023950	24/09/20	55	M	CFB		5	14	96%	O2 MASK	2L O2	NA	HTN	15	24-09-2020				11.4			5.16			71			18			353			606	332	1.83
7	1021418	21/08/20	42	M	CB		2	22	90%	O2 MASK	6L O2	NA	DM,HTN	17	21/08/20				9.2			11.6			88			8			295			450	243	1.85
8	1023907	24/09/20	67	M	CFB		2	26	90%	O2 MASK	5L O2	NA	DM,HTN	12	24/09/20				12.1			14.2			89			7			135			1002	318	3.15
9	1024635	4-10-20	52	M	CFB		4	18	95%	O2 MASK	4L O2	NA	HTN	14	04-10-20				14.5			4.8			83			11			143			917	308	2.98
10	1020024	31/07/20	60	M	CF		5	12	96%	RA	RA	NA	DM,HTN,IHD	18	31/07/20				10			4.3			59			31			289			56.86	279	0.20
11	1022622	07-09-20	39	M	C		3	20	96%	RA	RA	NA	NONE	9	07-09-20				13.3			8.7			59			31			168			74.25	208	0.36
12	1022763	09-09-20	70	M	CMF		1	24	85%	O2 MASK	15L	NA	DM,HTN	14	09-09-20				10.8			8.5			75			12			251			338	343	0.99
13	1024049	25/09/20	50	M	F	WEAKNESS	7	15	95%	RA	RA	NA	NONE	12	25/09/20				14.6			10.2			78			13			246			414	267	1.55
14	1021264	18/08/20	43	M	FM		4	18	96%	RA	RA	NA	NONE	14	19/08/20				9.3			14.2			95			3			385			777.9	332	2.34
15	1022375	04-09-20	30	M	CFB		3	26	92%	O2 MASK	3L O2	NA	NONE	15	04-09-20				11.3			10.6			72			19			337			27.38	219	0.13
16	1021495	22/08/20	75	M	CFBM	WEAKNESS	4	22	89%	NRBM	5L O2	NA	DM,HTN,IHD	24	22/08/20				11.7			6.6			68			22			227			412	269	1.53
17	1022667	07-09-20	59	M	CFB		3	21	90%	O2 MASK	6L	NA	DM	22	07-09-20	12-09-20			13.7			10			90			7			137			137	251	0.55
18	1022797	09-09-20	64	M	CM	WEAKNESS	2	14	99%	RA	RA	NA	DM	19	09-09-20				14.5			4.1			82			14			250			133	255	0.52
19	1018721	14/07/20	25	M	CFMB	DIARRHOEA	2	12	96%	RA	RA	NA	N0NE	12	14-07-2020				15.6			10.6			64			23			235			217.6	215	1.01
20	1022636	07-09-20	54	M	CFB		5	22	89%	O2 MASK	RA	NA	TB, ASTHMA	20	08-09-20	16/09/20			10.3	5.8		10.1			78	78		14	13		418			102	311	0.33
21	1018431	10-07-20	74	M	CFMB	WEAKNESS	2	16	97%	RA	RA	NA	DM,HTN	14	10-07-2020				7.3			7.6			62			12			169			104	350	0.30
22	1021041	15/08/20	33	M	CFMB		4	12	96%	RA	RA	NA	NONE	12	15/08				13.5			4.9			67	25		13			178			450	322	1.40
23	1019405	22/07/20	24	M	CFB		3	10	99%	RA	RA	NA	NONE	6	22-07-2020				12.6			4.9			49			42			268			652	280	2.33
24	1023483	18/09/20	57	M	CFB		5	20	93%	RA	2L/MIN	NA	HTN	5	18/09/20				15.4			13.5			88			6			436			758	329	2.30
25	1021292	19/08/20	23	F	CF		3	9	97%	RA	NA	NA	NONE	9	19-08-2020				13.4			9.4			60			27			288			654	289	2.26
26	1024867	07-10-20	60	M	CM		3	15	90%	O2 MASK	2L/MIN	NA	HTN,DM	12	07-10-20				12.3			11.3			67			21			202			549	314	1.75
27	1019869	29/07/20	26	F	CB		3	12	94%	O2 MASK	2L/MIN	NA	NONE	15	29-07-2020				10.8			9.8			64			20			291			667	297	2.25
28	1021570	24/08/20	56	F	CFB		8	16	90%	O2 MASK	2L/MIN	NA	DM,HTN	14	24/08/20				10.3			5.9			77			19			245			443	310	1.43
29	1019413	22/07/20	27	F	CMB		3	9	99%	RA	NA	NA	NONE	15	22/07/20				14.8			4.9			49			42			252			692	299	2.31
30	1020943	14/08/20	48	M	CMB		3	12	94%	O2 MASK	1L/MIN	NA	HTN	9	14/08/20				14.8			4.6			49			42			151			880	271	3.25
31	1021531	23/08/20	54	M	B	chest pain	1	16	95%	O2 MASK	1L/MIN	NA	DM	11	23-08-2020				13			5.7			54			21			223			1170	217	5.39
32	1025361	13/10/20	61	M	CMF	chest pain	2	13	97%	RA	NA	NA	DM,HTN	13	13/10/20				17.6			10.3			79			17			261			567	281	2.02
33	1020424	06-08-20	45	F	CF		4	15	97%	RA	NA	NA	NONE	14	06-08-20				11.1			9.3			76			19			186			789	350	2.25
34	1024956	08-10-20	60	M	CBF		2	26	88%	O2 MASK	4L/MIN	NA	DM,ASTHMA	22	08-10-20	10-10-20	11-10-20		7.4			18.3			82			11			216			1150	394	2.92
35	1020649	16/08/20	54	F	CB		3	22	91%	O2 MASK	2L/MIN	NA	DM,HTN	16	16-08-2020				14.8			4.9			49			42			197			776	286	2.71
36	1021443	21/08/20	27	F	CMF		3	16	99%	RA	NA	NA	NONE	9	21-08-2020				9.8			9.7			54			23			392			891	398	2.24
37	1023840	29/09/20	26	M	CB	weakness	3	20	95%	O2 MASK	1L/MIN	NA	NONE	10	29-09-2020				14.8			4.9			49			42			182			996	342	2.91
38	1020811	12-08-20	41	M	CF	weakness	3	19	96%	RA	NA	NA	NONE	11	12-08-20	14/08/20			14.8	12.5		4.9	5.7		57			34			2.29	3.24		456	223	2.04
39	1019609	25/07/20	24	M	CB	weakness	3	12	99%	RA	NA	NA	NONE	8	25/07/20				14.8			4.9			60			38			260			543	236	2.30
40	1022727	08-09-20	25	M	CBF	weakness	3	21	94%	O2 MASK	2L/MIN	NA	NONE	15	08-09-2020				12			7.5			65			22			250			629	257	2.45
41	1024639	4-10-20	44	F	F		7	15	96%	RA	NA	NA	NONE	7	04-10-2020				13			6.8			71			21			235			962	304	3.16
42	1017707	05-07-20	45	M	BFM		7	26	88%	O2	4L/MIN	NA	DM	18	5-7-20				13.5			10			84			10			259			453	273	1.66
43	1023711	21/09/20	71	F	CB		5	26	86%	RBM	2L/min	NA	CKD,IHD,DM	16	21/09/20				13.8			6.7			74			18			178			608.1	310	1.96
44	1021836	27/08/20	59	M	CFB		4	22	93%	O2 MASK	6L/MIN	NA	DM,HTN	4	27-08-2020				12.1			16.1			92			4			222			542	196	2.77
45	1021845	27/8/20	52	M	B		5	18	95%	RBM	15L/MIN	NA	DM	5	28/8/20				13.8			20.4			90			5			183			531	243	2.19
46	1023488	18/9/20	64	M	CF		3	12	98%	RA	NA	NA	DM,HTN,CKD	15	19/9/20				10			9.8			91			4			164			2000	249	8.03
47	1020455	7-8-20	60	M	C,F, B		2	22	85%	O2 MASK	5L/MIN	NA	DM, HTN	18	7-8-20				11.1			5.1			75			20			219			754	341	2.21
48	1019426	23/7/20	65	M	C, F		5	22	92%	O2 MASK	4L/MIN	NA	DM, HTN	16	23/7/20	26/7/20	27/7/20	28/7/20	14.1			7.2			70			25			161			429	268	1.60
49	1023326	16/9/20	85	M	FC		2	18	96%	RA	NA	NA	DM, HTN	9	16/9/20				10.11			11.4			74			19			203			776	351	2.21
50	1024174	28/9/20	60	F	F		5	32	77%	RBM	10L/MIN	NA	DM	16	28/9/20				11.4			8.1			70			30			25			719	339	2.12
51	1021407	28/8/20	20	M	CFM	weakness	1	9	98%	RA	NA	NA	NONE	8	28-08-2020				12.1			7.6			57			35			191			821	241	3.41
52	1022906	10-9-20	78	M	CB		5	24	84%	RBM	10L/MIN	NA	DM	22	11-9-20	17/9/20	26/9/20		12.8			6.6			88			9			187			1689	347	4.87
53	1025516	15/10/20	82	M	B		1	26	95%	RBM	5L/MIN	NA	DM, HTN, IHD	18	15-10-2020				9.5			10.8			95			2			156			1192	198	6.02
54	1020680	10-8-20	70	M	CB		3	30	92%	O2 MASK	7L/MIN	NA	DM, HTN	20	10-8-20	13/8/20			12.7			7.2			77			17			260			636	271	2.35
55	1024333	29/9/20	26	F	CBM		2	22	87%	O2 MASK	4L/MIN	NA	NONE	16	29/9/20				13			5.2			53			36			229			1151	243	4.74
56	1023878	23/9/20	72	F	BF		2	21	96%	O2 MASK	5L/MIN	NA	M, HTN, Parkinsonis	13	23/9/20				15.5			8.1			89			7			278			532	197	2.70
57	1024370	30/9/20	54	M	CF		1	14	96%	RA	NA	NA	HTN	7	30/9/20				11.6			6.7			70			24			222			743	324	2.29
58	1023727	21/9/20	60	M	CF		5	22	92%	2L/MIN	NA	NA	DM,HTN	17	21/9/20				18.2			9.3			75			14			227			1152	189	6.10
59	1020944	14/8/20	39	M	FB		8	20	94%	O2 MASK	6L/MIN	NA	NONE	14	14/8/20				11.8			72			73			20			340			2000	331	6.04
60	1021397	20/8/20	56	M	B		5	28	82%	RBM	12L/MIN	NA	COPD	19	21/8/20	22/8/20	2-9-20		15.4			251			93		93	5			217		155	631	219	2.88
61	1023886	23/9/20	59	M	MB		3	16	97%	RA	NA	NA	HTN	9	23/9/20				12.9			7.1			69			23			200			659	269	2.45
62	1023858	23/9/20	66	M	CFMB		4	20	95%	O2 MASK	2L/MIN	NA	DM, HTN	16	23/9/20				14.7			7.9			75			19			203			661	309	2.14
63	1024081	26/9/20	70	M	FB	chest pain	3	16	100%	RA	NA	NA	DM, HTN, IHD	20	26/9/20				18.3			8			80			13			311			640.1	189	3.39
64	1024337	29/9/20	30	M	CB		3	18	95%	RA	NA	NA	NONE	1-12	29/9/20				10.2			5.6			41			48			214			579	216	2.68
65	1022372	4-9-20	70	M	F		2	17	99%	O2	5L/MIN	NA	DM, HTN	21	4-9-20				10.2			6			63			23			236			456	229	1.99
66	1023275	15/9/20	75	M	F		3	22	90%	O2 MASK	2L/MIN	NA	DM, HTN	16	15/9/20				11			6.6			58			32			224			507	248	2.04
67	1023734	21/9/20	58	F	M		2	14	98%	RA	NA	NA	CA BREAST	9	21/9/20				13.1			8.1			76			17			229			432.8	314	1.38
68	1019966	30/07/2020	36	F	F	Generalised weakness	4	18	98%	RA	NA	NA	NONE	6	30/07/20				14.8			4.9			49			42			348			680	280	2.43
69	1019037	17/7/2020	32	M	FM		5	18	96%	RA	NA	NA	NONE	6	17/7/2020				10.7			6.9			54			47			183			589	189	3.12
70	1023978	25/9/2020	45	M	CB		4	26	88%	O2 MASK	5L/MIN	NA	NONE	20	25/9	28/9	8-10	4-10	11.4			11		11	85	84	85	7	6	7	235		316	323.7	211	1.53
71	1022559	06-09-2020	49	M	CB	WEAKNESS	3	22	99%	RA	NA	NA	DM	8	6-9-2020				12.5			4.9			63			20			229			580	198	2.93
72	1019554	24/7/2020	28	M	CMF	WEAKNESS	3	14	99%	RA	NA	NA	NONE	6	24-07-2020				11.8			6.7			54			40			387			672	251	2.68
73	1018960	16/7/2020	30	M	CMF		4	12	98%	RA	NA	NA	NONE	8	17/7/2020	26/7/2020			13.9	14.9		6.5	9.5		50			38			439	3.79		778	182	4.27
74	1019276	21/7/2020	36	M	CBF		7	28	91%	O2 MASK	2L/MIN	NA	NONE	6	21/7/2020				17.5			6.6			88			8			248			594.3	165	3.60
75	1019504	23/7/2020	22	F	FM		3	16	98%	RA	NA	NA	NONE	9	23/7/2020				9.2			6.8			57			37			210			765	389	1.97
76	1019491	23/7/2020	23	M	CFM		5	20	98%	RA	NA	NA	NONE	6	23/7/2020				11.2			7.5			57			39			319			891	372	2.40
77	1019294	21/7/2020	57	M	FB		2	24	97%	RA	1L/MIN	NA	DM,HTN	15	21/7/2020				14.3			10.1			69			27			166			454.4	254	1.79
78	1019830	29/7/2020	35	M	CFB		2	15	97%	RA	NA	NA	NONE	12	29/7/2020				13.9			5.7			56			33			176			573	366	1.57
79	1019960	30/7/2020	70	M	MF		3	18	98%	RA	NA	NA	NONE	9	30/7/2020				10.4			13.8			54			33			398			719.5	391	1.84
80	1025257	12-10-2020	46	F	MFC		2	16	98%	RA	NA	NA	DM, HTN, IHD	12	12-10-2020				11.7			16.3			74			16			345			456	321	1.42
81	1020431	06-08-2020	27	M	CMB		3	19	99	RA	NA	NA	NONE	6	07-08-20				11.9			6.2			49			42			287			880	268	3.28
82	1019553	24/07/2020	35	M	CF		5	22	98	RA	NA	NA	NONE	9	24-07-2020				9.6			6.3			47			46			232			704	371	1.90
83	1019545	24/07/2020	52	M	BM		5	24	89	O2 MASK	5L/MIN	NA	DM	18	24/07	27/07			12.7			5.9			77			20			187			347	298	1.16
84	1019047	18/07/2020	65	M	CB	LOOSE STOOLS	10	26	98	O2 MASK	2L/MIN	NA	DM,HTN	26	18/07				11.7			6.3			78			18			285			349.4	226	1.55
85	1019822	29/07/2020	50	M	CB		3	26	89	O2 MASK	4L/MIN	NA	HTN	24	29-07-2020	08-01			10.6	14.6		7.8			83			10			3.67	4.62		1577	333	4.74

											Other Labs at Admission																						
LDH 1	LDH 2		hsCRP (value)	IL-6 1	IL-6 2	IL-6 3	d-Dimer 1	d-Dimer 2	d-Dimer 3	d-Dimer 4	d-Dimer 5	Urea	Urea	Urea	Creatinine 1	Creatinine 2	Creatinine	Bilirubin	Bilirubin	Bilirubin	SGOT	SGOT	SGOT	SGPT	SGPT	SGPT	RBS	RBS	RBS	HbA1c	Date #1	Date #2	Date #3	Date #4	Mode of O2 (RBM,HFO,NIV, Ventilator) 1	2
573			83	7.74			1260					32			1.12			0.89			26			34			98				11-10-2020				HFO	
240			24	31.6			938					26			1.4			0.35			20			10			128			9.1	13-09-2020				RA	
232	288		13.7	16.06	35.58		344					24			0.9			0.37			22			16			99				21-08-2020				RA	
792			67	38.4			1590					58			1.13			0.93			22	93		38			174				30/09/20	1-10-20	3-10-20		NIV	NIV
336			21	10.6			667					42			0.76			1			37	31		29			144				29-09-2020				RA	
332			18.6	45			872					66			1.36			0.6			41			45			156				24-09-2020				O2 MASK	
411			20	52			924					22			0.96			0.74			36			19			207				22/08/20	23/08/20	25/08/20		RBM	RBM
105			78	93.5			1517					43			1.01			1.01			20			12			205				24/09/20	27/09/20	29/09/20		RBM	RBM
353			68	73.3			> 5000					22			0.74			1.3			31			33			137				06-10-20				RBM	
244			7	12			563					17			1.5			1.1			17			11			248				31/07/20	04-08-20	12-08-20		RA	RA
147			24	52			747					31			1.07			0.78			26			20			105				08-09-20	09-09-20			RA	RA
321			44	61			897					40			1.35			0.25			34			14			282				09-09-20	12-09-20	23/09/20		O2 MASK	HFO
289			82	4.54			649					32			1.2			0.48			20			63			163				25/09/20	26/09/20	27/09/20		RA	RA
433			89	69.9			1498					20			1.1			0.2			29			44			281				19/08/20	20/08/20			RA	RA
202			14	22			531					22			0.54			0.3			22			20			103				04-09-2020	05-09-2020			2L O2	4L O2
386			32	156			882					46			1.7			0.9			26			24			303				22-08-2020	23-08-2020	24-08-2022		5L O2	6L02
1012			24	47			1351	778				56			1.3			0.6			50			30			175				07-09-2020	11-09-2020			5L O2	2L02
196			22	21			480					75			2.51			0.5			29			26			209				09-09-2020				02 S0S 2L	
219			67	42			1205					16			1.01			0.9			14			16			106				14-07-2020				RA	
334			18	38.7			508					18			1			0.7			20			26			105				07-09-2020				O2 MASK	
302			14	34			456					22			0.9			0.64			22			24			102				10-07-20	11-07	12-07-2020		RA	RA
120			72	60.4			996					24			1			0.42			34			32			96				15/08/20	17/08/20	20/08/20	22/08/20	RA	5L O2 MASK
358			89	22			1125					31			0.7			0.45			32			31			104				22-07-2020				RA	
306			36	22			893					36			0.97			0.78			116			59			98				18-09-2020	20-09-2020	21-09-2020		4L	6L
204			41	12.24			790					30			1.1			0.33			11			18			103				19-08-2020				RA	RA
306			20	15			1247					17			1.3			1.25			25			18			204				07-10-2020	10-10-2020	12-10-2020		2L	4L
246			33	120			1759					14			0.78			1.1			27			22			112				29-07-2020				RA	RA
340			25	21			602					19			1.1			0.57			22			35			204				24-08-2020	26-08-2020	28-08-2020		2L	3L
358			78	89			996					31			0.54			0.65			32			31			99				22-07-2020				RA	
358			114	90.1			1487					14			0.7			0.8			22			36			187				14-08-2020				RA	RA
279			112	88			1102					22			1.07			1.1			28			26			145				23-08-2020				RA	RA
254			43	102			789					26			0.8			0.9			26			28			102				13-10-2020	14-10-2020	15-10-2020		RA	RA
176			78	62			502	933	1090			72			1.3			0.6			32			26			189				06-08-2020	10-08-2020	11/82020		1L/MIN	2L/MIN
484		622	89	60.4			996					85			1.45			0.35			31			19			245				08-10-2020	10-10-2020	12-10-2020		HFO	HFO
358			46	105			702					31			1.1			1.1			38			31			285				17-08-2020	18-08-2020	20-08-2020		O2 MASK	O2 MASK
402			22	27.3			996					22			0.78			0.9			32			35			102				21-08-2020				NONE	
358			112	121	40.97		823	217				31			1.1			0.45			32			31			101				29-09-2020	01-10-2020	03-10-2020		02 MASK	02 MASK
546	194		52	66			996					21			0.6			0.9			34			32			126				12-08-2020	14-08-2020			RA	RA
421			43	32			1401					31			0.7			0.8			32			32			85				25-07-2020	27-07-2020	29-05-2020		RA	O2 MASK
323			56	12			721					25			0.6			0.8			34			31			124				08-09-2020	09-09-2020			RA	
404			68	105			1448					8			6.4			0.52			32			24			98				04-10-2020	06-10-2020			RA	RA
402			33	123			987					57			1.41			0.61			27			20			120				05-07-2020	08-07-2020			O2 MASK	RA
456			43	241			450					36			2.4			0.41			25			15			247				21-09-2020	25/09/20			RBM	RBM
674			78.5	169			1532					21			1			1.06			22			20			302				29/08/20	04-09-20	05-09-2020		HFO	RBM
660			43	33.51			775					59			0.83			0.9			19			40			117				28/8/20	03-09-2020			RBM	RBM
433			214	218			> 5000					55			0.6			1			22			29			156				18-09-2020	20-09-2020			RA	RA
425			32	46.19			676					22			0.73			1.2			17			12			225			9.7	9-8-20	14/8/20	18/8/20		RBM	RBM
789			22	32.45		37.4	746			633		31		58	1.4			0.51		0.72	54		94	44		64	129				24/7/20	27/7/20			O2 MASK	RA
251			53	33			661					32			2.32			0.25			19			15			245				17/9/20	18/9/20			RA	RBM
397			43	49.8			1472					36			0.68			0.13			49			22			212			7.5	28/9/20	29/9/20	1-10-20		RBM	RBM
212			78	97.8			1278					32			0.7			0.9			32			25			96				28-08-2020	29-08-2020			RA	RA
402		641	109	112	15.29	10.53	3411	6883	> 5000			37			0.87			0.5			31			20			317				23/9/20	25/9/20	28/8/20		HFO	HFO
368			213	136.1			1864					43			1			0.5			31			28			285				16/10/20	17/10/20			RBM	RBM
259			216	89.5			732					65	84		1.4			0.22			18			10			185				12-8-20	15/8/20	21/8/20		RA	RBM
168			211	149.4			1140					17			0.63			0.46			17			12			95				30/9/20	1-10-20	3-10-20		RA	RA
504			39	102			1451					51			1.23			1.32			19			36			380				24/9/20	26/9/20	28/9/20		RBM	RBM
456			22	136.6			673					31			0.9			0.46			53			51			156				3-10-20				O2 MASK	
573			156	40.27			> 5000					32			1.32			2.48			109			116			101				25/9/20	26/9/20	29/9/20		RBM	RBM
602			98	52.81			1437					35			1.13			0.67			103			21			26				16/8/20	17/8/20	18/8/20		O2 MASK	O2 MASK
397		434	43	15.4		1.65	1519	1248	1073			65		72	0.9		0.55			1.07	22		20	66		47	251				21/8/20	2-9-20			RBM	RBM
515			36	22			605					24			0.7			0.68			22			32			102				25/9/20	27/9/20	30/9/20		RBM	RBM
616			112	120			588					35			1.5			0.66			38			40			308				23-09-2020	26-09-2020	28-09-2020		O2 MASK	O2 MASK
457			154	67.7			1617					83			1.05			9			34			28			306			12.9	27/9/20	28/9/20			RA	RA
207			35	15.5			554					12			0.49			0.35			15			10			118				29-09-2020				RA	
266			221	122.3			785					33			1.27			1			23			12			230				4-9-20				O2	
269			94	314.8			>5000					32			0.96			0.54			17			13			174				16/9/20	20/9/20			RBM	RBM
301			18	32.74			856					15			0.55			0.9			33			14			214				21-09-2020	22-09-2020			RA	RA
339			117	23			996					31			0.69			0.6			22			32			114				30/07/20				RA	
268			98	96			1102					21			0.94			0.8			38			34			98				17-07-2020	20-07-2020	24-07-2020		RA	O2 MASK
419			24	16.73			639					23			0.57			1			35			32			122				14/10/2020				HFO	
358			24	6.04			746					31			0.88			0.6			29			27			300				06-09-2020	10-09-2020			RA	RA
458			26	43			782					32			0.9			0.9			24			38			104				24-07-2020	28-07-2020			RA	RA
210	355		154	133			4620	192				21	24		0.72	0.72		0.45			14			14			97				16-07-2020	19-07-2020			RA	RA
349			14	35			3243					39			0.94			0.59			85			64			83				22/7/2020	24-07-2020	26/7/2020		RBM	RBM
226			21	28			450					35			0.8			0.37			19			10			96				23-07-2020	25-07-2020			RA	RA
259			27	119			2033					27			0.9			0.54			28			24			94				23-07-2020	25-05-2020	27-05-2020		RA	O2 MASK
396			56	122			688					27			0.98			1.2			26			27			256				22-07-2020	26-07-2020	29-07-2020		RA	RBM
395			45	96			712					17			0.89			0.86			21			24			97				29-07-2020	02-08-2020	05-08-2020		O2 MASK	RBM
671			21	134			789					24			0.73			1.7			22			24			239				01-08-2020	04-08-2020			RA	RA
498			22	98			874					55			1.11			0.9			22			38			149				12-10-2020				RA	
358			164	60.4			996					31			0.88			0.45			32			39			107				06-08-2020	08-08-2020	10-08-2020		RA	O2 MASK
254			34	16.1			577					17			1			0.9			33			40			147				24-07-2020	27-07-2020			RA	RA
354			78	94.6	3.13		725	356				34			1.03			0.61			31			29			242				25/07	26/07	28/07	01-08	RBM	RBM
395			33	67.2			356					27			0.98			1.2			33			56			256				23/07	25/07	30/07		RBM	RBM
258			198	52.2			2231					32			1.03			0.6			66	60		78	71		241				29/07	02-08	04-08		RBM	RBM

70										TREATMENT									OUTCOME				
3	FiO2 1	2	3	SpO2 1	2	3	PO2 (ABG) 1	2	3	Remdesivir (No. of Doses)	Tocilizumab (No. of Doses)	LMWH (Max Dose)	Unfractioned Heparin (Max Dose)	Type of Steroid used (MethylePred or dexa)	Max dose per day used	Thymosine 1 Alpha (No of doses)	Plasma (No. of times used)	Alteplase (Doses)	Improved and Discharged	Died (note - this column should be left empty as this page is only for survivors)	Worsend and AMA	Improved and AMA	Outcome Date
	95			97%						none		80mg		methyl pred	50mg				17-10-2020				17-10-2020
										5		80mg		methyl pred	50mg				18/09/20				18/09/20
										5		80mg		methyl pred	80mg				28/8/20				28/8/20
NIV	90	80	80	97	89	95	96.6	64.3	75.6	7		120mg		methyl pred	500 mg		1	50mg	3-10-20				3-10-20
	NA			99%						8		120mg		methyl pred	120				7-10-20				7-10-20
RA	8LO2	2LO2		93%	95%	93%				6		80MG		methyl pred	500MG				30/09/20				30/09/20
RBM	15L	15L		93%	92%		20.4	68.4		5		80MG		methyl pred	80mg				28/08/20				28/08/20
	6L			95%						9		80 MG		methyl pred	80MG				15/10/20				15/10/20
RA				96%	95%	96%				2		80MG		methyl pred	80MG				07-10-20				07-10-20
				94%	96%					3		40MG		methyl pred	80MG				12-08-20				12-08-20
				85%	91%	94%				2		80 MG		methyl pred	80 MG				09-09-20				09-09-20
RA				94%	96%	97%				6	1	100MG		methyl pred	1000 MG				25/09/20				25/09/20
				94%	96%					5		80MG		methyl pred	80MG				29/09/20				29/09/20
				92%	94%					7		80 MG		DEXA	12 MG				24/08/20				24/08/20
RA				90%	90%	99				6		80 MG		methyl pred	80 MG				10-09-20				10-09-20
				92%	96%					6		80 MG		methyl pred	80 MG				08-27-22				08-27-22
				99%						1		80MG		methyl pred	120MG				15/09/20				15/09/20
				96%						NONE		80 MG		methyl pred	120 MG				12-09-20				12-09-20
				94%	94%	95%				3		40		methyl pred	80				18/07/20				18/07/20
3L O2				96%	92%	95%				5		80mg		methyl pred	500mg				25/09/20				25/09/20
				99%						3		40		methyl pred	80MG				13/07/20				13/07/20
6L				93%	95%	97%				5		40mg		methyl pred	80mg				22/08/20				22/08/20
				96%	97%					5		80mg		methyl pred	80mg				28/07/20				28/07/20
10L				97%	100%	98%				4		40mg		methyl pred	80mg				24/09/20				24/09/20
RA				96%	99%	96%				6		40mg		dexa	12mg				23-08-2020				23-08-2020
1L				94%	92%	95%				6		40mg		methyl pred	80mg				15/10/20				15/10/20
				99%						5		40mg		methyl pred	80mg				03-08-2020				03-08-2020
RA				96%	98%	99%				3		40mg		methyl pred	80mg				31/08/20				31/08/20
				96%	98%					5		40mg		methyl pred	mg				25-07-2020				25-07-2020
				99%	98%					NONE		40mg		dexa	12mg				20-08-2020				20-08-2020
				92%	94%	100%				NONE		40MG		dexa	12mg				25/08/20				25/08/20
RBM	3L	6L	8L	95%	96%	100%				5		40MG		methyl pred	80MG				15/10/20				15/10/20
RA				96%	92%	99%				6		40mg		methyl pred	80mg				12-08-20				12-08-20
										NONE		40MG		DEXA	12MG				22/08/20				22/08/20
RA				91%	93%	99%				5		80mg		methyl pred	80mg				03-10-2020				03-10-2020
				96%	97%					5		80mg		methyl pred	80mg				15-08-2020				15-08-2020
RA				96%	92%	98%				NONE		40MG		methyl pred	40 MG				30/07/20				30/07/20
				96%	98%					NONE		NA		DEXA	12MG				10-09-2020				10-09-2020
				96%	96%	97%				NONE		NA		DEXA	12MG				06-10-2020				06-10-2020
				92%	99%					3		40mg		DEXA	12MG				09-07-2020				09-07-2020
	5L	2L		94%	98%					NONE		80Mg		Methyl prednisone	40Mg tid				1-10-20				1-10-20
RA				85%	88%	96%	99%			6		40Mg		Methyl prednisone	1000Mg				6-9-20				6-9-20
	15L	12L		95%	95%					6		80Mg		Methyl prednisone	80Mg				04-09-2020				04-09-2020
				98%	99%					4		80Mg		Methyl prednisone					21-09-2020				21-09-2020
RBM	4L	6L	2L	94%	98%	99%				6		80Mg		Methylpred	120mg				19/8/20				19/8/20
	4L			100%	95%					6		80 Mg		Dexamethasone	16mg				1-8-20				1-8-20
		2L		96%	99%					NONE		80 Mg		Methyl prednisolone	80 mg				19/9/20				19/9/20
RBM	10L	15L	2L	95%	97%	99%				6		40 Mg		Methyl prednisolone					2-10-20				2-10-20
				98%	98%					NONE		NONE		DEXA	12MG				30-08-2020				30-08-2020
HFO	60L	60L	60L	94%	90%	89%			50	6		80 Mg		Methyl prednisolone	1000 Mg				30/9/20		Worsened		30/9/20
	10L	15L		90%	85%		47			3		80 Mg		Methyl prednisolone	120 Mg				17/10/20		Worsened		17/10/20
RBM		5L	5L	92%	94%	98%				7		80 Mg		Dexamethasone	12 Mg				24/8/20				24/8/20
RA				94%	96%	98%				4		80 Mg		Methyl prednisolone	80 Mg				5-10-20				5-10-20
RBM	10L	8L	4L	98%	98%	96%				5		40 Mg		Methyl prednisolone	80 Mg				29/9/20				29/9/20
	2L			98%						5		40 Mg		Methyl prednisolone	80 Mg				5-10-20				5-10-20
RBM	2L	4L	6L	94%	94%	94%				6		40 Mg		Methyl prednisolone	80 Mg				29/9/20				29/9/20
O2 MASK	6L	2L	2L	99%	98%	97%						40 Mg		Dexamethasone	8 Mg				20/8/20				20/8/20
	10L	8L		99%	92%					10		80 Mg		Methyl prednisolone	1000 Mg			50 Mg	3-9-20		Worsened		3-9-20
RA	4L	2L		96%	96%	98%				5		80 Mg		Methyl prednisolone	500 Mg				30/9/20				30/9/20
RA	5L	2L	NA	92%	94%	98%				7		40 Mg		Methyl prednisolone	40 Mg				29/9/20				29/9/20
				98%	97%					3		80 Mg		Methyl prednisolone	500 Mg				28/9/20				28/9/20
				97%						5		80mg		Methyl prednisone	80mg				3-10-2020				3-10-2020
	4L			99%						3		80mg		Methylpred	80mg				6-9-20				6-9-20
	4L/MIN	2L/MIN		98%	98%					5		80mg		Methyl prednisone	80mg				21/9/20				21/9/20
				96%	98%					2		80mg		Methyl prednisone	80mg				23/9/20				23/9/20
				98%						3		NONE		DEXA	12MG				02-08-2020				02-08-2020
RA		3L/MIN		98%	90%	98%				6		40MG		Methlypred 80mg					25/7/2020				25/7/2020
	48 L			90%			68%			6		80mg		methyl pred	80mg				19/10/2020				19/10/2020
				96%	98%					5		80mg		methyl pred	80mg				11-09-2020				11-09-2020
				98%	99%					6		40MG		methyl pred	80MG				30/7/2020				30/7/2020
				98%	99%					4		40MG		methyl pred	80MG				19-07-2020				19-07-2020
RA	2L	2L		98%	97%	98%				7		40mg		METHYL PRED	80mg				28-07-2020				28-07-2020
				99%	98%					NONE		NONE		DEXA	12MG				27-07-2020				27-07-2020
RA	3L/MIN	RA		98%	90%	96%				4		NONE		METHYL PRED	80 MG				29/7/2020				29/7/2020
RA	NA	10L/MIN	RA	99%	86%	97%				6		80mg		METHYLPRED	80mg				2-8-2020				2-8-2020
RA	5L/MIN	5L/MIN	NA	98%	99%	98%				6		80MG		METHYLPRED	80MG				7-8-2020				7-8-2020
				96%	99%					NONE		80mg		methyl pred	80mg				8-4-2020			YES	8-4-2020
				97%						NONE		NONE		DEXA	12MG				13/10/2020		DISCHARGED ON		13/10/2020
RA	NA	2L./MIN	RA	98%	92%	98%				5		80		methyl pred	80				10-08-2020				10-08-2020
	NA	NA		96%	98%					NONE		40MG		methyl pred	80MG				27-07-2020				27-07-2020
RBM	12L	10L	5L	96	94	96				6		40		DEXA	12				03-08-2020				03-08-2020
ROOM AIR				97	99	95				7		40		DEXA	8				31-07-2020				31-07-2020
ROOM AIR	5L	5L	OOM AI	92	94	94				6		40		methyl pred	80MG				04-08-2020				04-08-2020

#NAME?					CLINICAL PARAMETERS AT Admission																														INFAMMATORY PARA					
Sl. No.	IP No	Date of Admission	AGE	Sex	Symptoms (C=cough; F=Fever; B=breathlessness; M=Myalgia, Loss of smell=LS; Loss of taste=LT)	Any other symptoms V:Vomiting, LO=loose stools, W:weakness, AP: Abd pain, AD: Abd distn, J:Jaudince:Hematuria, LAPP: Decreased Appetite, SoT: Sore throat, CP: Chest pain, AltSen: Altered sensorium, Ed:Edema, LoOP: Low urine, LWK: limb weakness,	Time to hospial from symptom onset (Days)	Admission Respiratory rate (RR/min)	Admission SPO2	Admission O2 modality (RBM,HFO, NIV, Ventilator)	Admission O2 rate (Lt/min)	Admission FiO2	Co-morbidites	CT severity score(~/25)	DATE OF INV #1	DATE OF INV #2	DATE OF INV #3	DATE OF INV #4	Hb 1	Hb2	Hb3	Hb4	Hb5	Hb 5(mention date)	TLC1	TLC2	TLC3	TLC4	TLC5	NEUTROPHIL %1	NEUTORPHIL%2	NEUTROPHIL%3	NEUTROPHIL%4	Lymhocyte % 1	Lymphocyte % 2	Lymphocyte % 3	Lymphocyte % 4	Lymphocyte % 5	Platelets	Platelets	Platelets	Platelets	Platelets	Ferritin
1	1019822	24-08-2020	74	M	FB		7	28	96	RBM	10L/MIN	NA	DM	12	24/8				10.8						20.4					89				7					1,27,000					1349
2	1019401	22/07/20	69	M	FBC		6	26	98	RBM	8L/MIN	NA	HTN,IHD	16	22/7	27/7			14.5						12.1					91				6					1,91,000					387
3	1019733	27/07/20	72	F	CB		3	22	97	RBM	5L/MIN	NA	HTN	22	28/7	31/7			10.5	11.8					6.3	10.8				79	79			12	3				2,61,000	3,27,000				1583
4	1013634	06-05-2020	51	M	CFM		4	24	94	O2 MASK	2L/MIN	NA	HTN,CKD	18	06-05-2020	07-05-2020			10.8	10.8					4.4	3.6				77	64			11	24				63,000					1267
5	1019721	27/07/20	64	M	CFMB		10	34	95	HFO	40L/MIN	NA	DM	24	28-07-2020	02-08-2020	04-08-2020		12.1	11	7.8				12.6	16.7	24			91	96	96		7	3	2			1,52,000	42,000	64,000			448
6	1021469	21/08/20	85	M	B		3	28	94	O2 MASK	5L/MIN	NA	DM,HTN	22	21-08-2020	22-08-2020			11.8						10.3					94				2					2,55,000					2120
7	1022318	03-09-2020	66	F	FMB		7	28	94	RBM	8L/MIN	NA	DM, HTN	18	03-09-2020				11.5						12					89	12			6					107000	6				915
8	1022362	03-09-2020	58	M	FB		3	26	92	RBM	15L/MIN	NA	DM	8	03-09-2020	12-09-2020			11.1						11					91				6					3,15,000					1060
9	1021169	17-08-2020	70	M	M		3	24	90	O2 MASK	5L/MIN	NA	DM,CKD	19	17-08-2020	26-08-2020			12						4.2					65				22					192000					810
10	1021530	22/08/2020	57	M	CB		5	28	88	RBM	10L/MIN	NA	IHD	24	23-08-2020				14.1						21.1					94				2					108000					1234
11	1019598	25/7/2020	60	M	CFB		3	28	90	O2 MASK	5L/MIN	NA	DM	22	25-07-2020	28-07-2020			12.6						14.5					83				13					1,82,000					2650
12	1020782	12-08-2020	82	M	CFM		5	29	93	RBM	10L/MIN	NA	HTN/DM	25	12-8	13/8	14/8	20/8	11.4	12.5	10.8	12.1			13	13	12.8			80	89	90		16	8	5			1,66,000	1,59,000	1,74,000	1,78,000		1078
13	1021922	28-08-2020	58	F	BF		2	42	37	NIV		100	DM, HTN	24	28/8				10.4						12					94				5					1.45.000					1369
14	1020039	31/7/2020	73	M	CB		3	26	80	NIV		100	DM/HTN/OBESITY/OSA	22	31/7	3-8	4-8	5-8	10.6	10.8					23.5	10.7				72	86			18	8				95000	243000			259000	858
15	1022367	3-9-2020	75	M	FB	V, LO	3	45	35	NIV		100	DM,HTN,CKD	25	3-9				10.8						4.3					72				19					1,20,000					1256
16	1020295	4-8-2020	59	M	CMB		2	26	92	O2 MASK	6L/MIN		NONE	15	5-8	11-8			10.4						5.4					63				24					112000					231
17	1020750	11-8-20	64	M	CF		5	28	100	NIV		100	DM,HTN,IHD	18	11-8				9.2						14.7					93				4					1,80,000					1014
18	1022733	8-9-2020	70	M	B	CP	4	22	96	O2 MASK	5L/MIN	NA	HTN,IHD	20	09-09-2020				10.3						9.8					64				64					376000					1104
19	1020523	8-8-2020	71	M	CFB		2	20	88	RBM	4L/MIN	NA	DM,HTN	22	08-08-2020				13.6						5.5					82				13					1,47,000					344
20	1019616	25/7/2020	83	M	FB	V	4	22	100	NIV		100	IHD	22	25-07-2020				15.6						10.2					87				7					195000					1186
21	1022407	04-09-2020	67	M	CBM		3	30	88	RBM	15L/MIN	NA	HTN	18	09-04-2020				12.6						16.4					95				3					2,00,000					269
22	1021629	24/8/2020	73	F	CFB		3	26	87	RBM	15L/MIN	NA	DM,HTN	24	24/8	25/8	26/8	27/8	11.3	12.9					6.3	18.4				74	92			21	5				164000	245				1080
23	1023926	24/9/2020	72	M	FB		7	22	94	RBM	15L/MIN	NA	DM,HTN	20	24/9				12.5						12.4					90				8					214000					1785
24	1022264	02-09-20	60	M	CFB		4	36	82	RBM	10L/MIN	NA	ASTHMA	23	02-09-2020				17.3						47.1					94				1					378000					1013
25	1022671	07-09-2020	39	M	CB		4	34	70	NIV		100		6	07-09-2020				15.4						9.8					64				32					38000					1212
26	1023965	24/09/20	70	M	CFB		3	28	64	NIV		100	DM, HTN	24	24/9	27/9			16.1						8.1					86				11					225000					1434
27	1022916	11-09-2020	50	M	CB		3	22	93	O2 MASK	15L/MIN	NA	DM	22	11-09-2020				12.4						6.7					62				32					238000					308
28	1022462	5-9-2020	51	M	CBF		4	24	93	RBM	8L/MIN	NA	DM,AKI	13	05-09-2020				13.4						20					94				3					69000					2318
29	1022738	8-9-2020	63	M	CFMB	P,LoOP, Hematur	2	18	95	NIV		100	DM	18	08-09-2020				12.5						10.3					89				9					459000					1414
30	1019602	25/7/20	68	M	CFB		3	28	87	RBM	15L/MIN	70	DM	22	25-07-2020				8.5						19					90				5					183000					737.9
31	1020598	08-08-2020	49	M	FM		8	30	86	RBM	10L/MIN	NA	DM	16	9-8	10-8	18/8	20/8	14.1		12.7	14.2			4.7	4.6	10.1			81	75	95		16	20	4			147000	210000	171000	171000		1349
32	1022740	8-9-2020	74	M	B		1	32	70	NIV		70	DM,HTN	20	08-09-2020	9-9	10-9	11-9	12.8						16.7					97				2					232000					994
33	5783029	25/7/2020	73	M	CFB		4	26	76	RBM	10L/MIN	NA	DM,HTN	22	26/7	28/7	5-8		10.8						14.1					89				6					1,84,000					1791
34	1023296	15/09/2020	66	M	CFB		7	36	96	RBM	5L/MIN	NA	DM,HTN	24	16/9	19/9			14.3	15.1					2.6	12.8				75	90			20	5				169000	291000				847.6
35	1023272	15/09/2020	52	M	CFB		2	35	66	RBM	15L/MIN	NA	HTN	22	15/9	18/9	20/9		13.9						10.9					76				21					140000					887
36	1021459	21/08/2020	56	M	M		4	32	84	RBM	15L/MIN	NA	DM	20	21/08	24/8			13	11.5					14.7					88	91			9	7				234000	198000				923
37	1021997	29/08/2020	71	M	CFB		7	30	93	NIV		100	IHD	14	29/8	30/8	1-9		13.5	10.7	14.6				11.3	10.7	15			95	95	96		4	4	3			132000					1271
38	1021081	16/08/2020	66	F	CFB		2	26	94	RBM	10L/MIN	NA	DM	20	16/8	19/8			12	12.2					9.7	8.8				86	95			11	2				2610000	189000				882
39	1021843	27/08/2020	84	M	B		11	24	96	O2 MASK	8L/MIN	NA	DM,HTN,IHD	16	28/8				13.3						13					90				4					236000					889
40	1021421	21/08/2020	64	M	CB		5	24	94	NIV		100	DM,HTN	22	21/8	24/8			16.7	16.3					29.7	22.6				95	96			2	1				208000					1507
41	1021050	15/08/2020	32	M	CFB		20	36	86	RBM	15L/MIN	NA	NONE	18	15/8	18/8			15.7	14.9					18	19.5				71	18			19					419000					1075
42	1022051	31/08/2020	65	M	CFB		5	28	56	NIV		100	DM,HTN	22	31/8				10.1						17					93				5					107000					2000
43	1021386	20/08/2020	36	M	MB		2	28	62	RBM	15L/MIN	NA	Hypothyroid	25	20/08				17.1						14.4					81				14					135000					645
44	1020930	13/08/2020	68	M	FB	SoT	3	22	82	RBM	10L/MIN	NA	HTN,DM	22	13/08	16/08			14.7						15.8					86				6					140000					632.4
45	1020766	11-08-2020	56	M	BM		5	26	90	RBM	5L/MIN	NA	DM,HTN,IHD	16	11-8				11.8						6.4					73				22					179000					1129
46	1019711	27/07/2020	77	M	CFMB		4	30	86	RBM	15L/MIN	NA	DM,HTN	20	27/7	6-8	13/8		15.4		13.9				5.16		12.1			76		97		19		2			121000		155000			1015
47	1021514	22/8/2020	65	F	CB		3	32	77	RBM	15L/MIN	NA	DM, HTN	20	23/8				11.8						13					90				6					257000					1042
48	1021972	29/8/2020	69	M	CB	LAPP	5	26	83	RBM	15/MIN	NA	DM,HTN,CKD	19	29/8	31/8			9.3						4.3					93				6					203000					1450
49	1021262	18/8/20	68	M	FB	LAPP, W	3	27	86	RBM	15L/MIN	NA	NONE	17	19/8				13.4						16.1					87				7					208000					2000
50	1020855	13/08/2020	81	M	CFB		4	38	42	NIV		100	DM,HTN	21	13/8				12.3						7.8					64				32					267000					46.52
51	1021636	24/08/2020	61	M	CFB		3	36	82	RBM	15L/MIN	NA	DM	14	25-08-2020				15.2						9.4					87				10					203000					1341
52	1021950	29/08/2020	58	M	CFB		3	40	98	NIV		100	DM,HTN	16	30/8				11.7						8.6					92				4					248000					1529
53	1021326	19/8/2020	57	M	CMB		5	26	86	RBM	10L/MIN		IHD	22	20-08-2020				14						6.2					89				7					205000					1133
54	1022949	11-09-2020	84	M	CFB		3	24	88	NIV		100	HTN	20	11-09-2020				13.4						22.7					73				8					292000	250000				567
55	1021523	22/08/2020	52	M	CB		7	26	82	NIV		100	HTN,TB	21	22/08				11.5						34.5					95				3					428000					968
56	1023099	13-09-2020	81	F	FBM	LAPP	2	27	52	NIV		100	HTN	17	14-09-2020	15-09-2020	16-09-2020	17-09-2020	10.9						12.1					71				18					206000					1598
57	1020115	02-08-2020	78	M	B		3	22	93	RBM	10L/MIN	NA	DM,HTN,IHD	5	02-08-2020				11.8						14.6					72				17					131000					998
58	1020763	11-8-20	60	F	CB	CP	4	30	90	RBM	12L/MIN	NA	DM,HTN,CKD	22	11-8-20	14/8/20	18/8/20		9	8.6	9.1				9	9000				74	93			18	6				300000	233000				887
59	1023505	19/9/20	90	M	B		3	28	95	RBM	8L/MIN	NA	DM,HTN	18	19/9/20				17.2						8.1					90				6					167000					1290
60	1022988	11-9-20	60	M	FB	W,LAAP	5	40	31	NIV		100	DM	17	11-9-20				13.9						14.6					97				2					220000					615
61	1022752	08-09-2020	38	M	CFB	W,LAAP	6	16	90	NIV		100		16	9-9-20				18						39.8					76				5					447000					347
62	1020910	13/8/20	59	M	CFB	W	6	28	95	RBM	10L/MIN	NA	DM	18	13/8	18/8	20/8		15.3	14.8	16.8				7.8		12.2			84		97		12		2			220000	199000	282000			1566
63	1021528	22/8/20	70	M	CFB		3	12	78	NIV		100	DM,HTN	20	23/8	24/8	31/8		13.4						9.8	9.5				98	96			2	3				139000					1574
64	1023093	13/9/20	70	M	CF		4	22	93	O2 MASK	10L/MIN	NA	DM	24	13/9	14/9	15/9		10.3		9.1				12.3					98				2					402000					1658
65	1022908	10-09-2020	55	F	FB		7	24	93	O2 MASK	5L/MIN	NA	HYPOTHYROID	20	10-9	17/9			11.3						4.7					68				28					217000					850
66	1020525	8-8-20	50	M	B		4	30	70	RBM	15L/MIN	NA	NONE	25	8-8	10-8	11-8		14.4		14.4				9.8		9.2			68		92		29		8			135000		253000			3037
67	1020446	6-8-20	46	M	MB		4	32	80	RBM	10L/MIN	NA	IHD	24	06-08-2020				11.9						6.3					85				11					408000					2157
68	1021029	15/8/20	75	M	CFB		3	32	85	RBM	5L/MIN	NA	DM,HTN	18	15/8	16/8	18/8		13.8						7.9					87				11					102000					810
69	1023170	14/9/20	47	M	CF		3	24	97	O2 MASK	15L/MIN	NA	OLD TB	16	14/9	18/9			15.1						12.3					89				7					184000					847
70	1023297	15/09/20	49	M	CFB		5	22	86	RBM	15L/MIN	NA	NONE	18	16/9	18/9	21/9	23/9	13.1				15.9		11.6					89				7					47000					758.9
71	1021203	18/8/20	60	M	CB		4	24	75	NIV		100	NONE	24	18/8				12.3						8.3					62				34					195000					1258
72	1021494	22/08/20	81	M	MFB		3	22	97	RBM	5L/MIN	NA	DM	16	22/8	25/8	31/8	1-9	13.7	13.5		14.9			3.9	10.5		29.6		74	88		96	21	8		2		131000	208		136		998
73	1023059	13/9/20	77	M	MB		4	24	94	RBM	15L/MIN	NA	DM, IHD	24	13/9				12.6						16					84				8					464000					1387
74	1020214	3-8-2020	74	M	FB		3	26	83	RBM	15L/MIN	NA	DM,HTN,CVA	16	3-8	5-8	6-8	10-8	12.7						14					82				12					347000	557		136		1290
75	1020620	9-8-20	54	M	B		3	22	77	RBM	15L/MIN	NA	NONE	22	9-8	12-8			11.8						12					91				6					246000					1683
76	1020695	10-8-20	70	M	CB		2	24	74	RBM	15L/MIN	NA	DM,HTN	20	10-8	14/8			11.9						13.1					91				5					278000					1856
77	1023607	20/9/20	63	M	M		3	22	99	O2 MASK	5L/MIN	NA	HTN	22	20/9/20				12.1						21					94				4					133000					1234
78	1024541	02-10-2020	80	M	B	AltSen	4	42	85	RBM	15L/MIN	NA	DM	18	2-10				15.8						6.8					95				3					78000					2140
79	1023176	14/9/2020	70	M	CFB		4	28	100	NIV		100	IHD,DM,HTN	15	14/9	15/9	17/9	19/9	13.9						7.4					90				8					185000					2260
80	1024729	05-10-2020	80	F	CB	W	3	32	92	RBM	3L/MIN	NA	DM,HTN	13	6-10	7-10	9-10	12-10	11.8	11.3		11.4			7.8			16.2		77			93	13					202000	250000		265000		1980
81	1024059	26/9/2020	79	M	CFBM		4	33	92	RBM	10L/MIN	NA	DM	18	26-Sep	27/9			15.4						11.8					90				6					348000					1983
82	1022971	11-9-2020	57	M	CFB		5	26	91	RBM	10L/MIN	NA	NONE	19	11-9	16/9			13.7	15.1					14.2	14.2				96	96			2	2				96000					1022
83	1019824	28/7/2020	58	M	CFB		2	30	85	O2 MASK	5L/MIN	NA	DM	24	28/7				13.6						10.3					91				5					285000					1254

.METERS AT Admission																		Other Labs at Admission																																		
Transferrin	Ferritin/Transferrin ratio	LDH	LDH	LDH	LDH	LDH	hsCRP	IL-6	IL-6	IL-6	IL-6	IL-6	d-Dimer	d-Dimer	d-Dimer	d-Dimer	d-Dimer	Urea	Urea	Urea	Urea	Urea	Urea	Creatinine	Creatinine	Creatinine	Creatinine	Creatinine	Creatinine	Bilirubin	Bilirubin	Bilirubin	Bilirubin	Bilirubin	Bilirubin	SGOT	SGOT	SGOT	SGOT	SGOT	SGOT	SGPT	SGPT	SGPT	SGPT	SGPT	SGPT	RBS	RBS	RBS
182	7.41	701					221	289	123				1948					84						1.94						1.91						48						24						114		
198	1.95	386	984				24	33.42	16.9				572	1624				45						0.93						0.6						58						25						189		
180	8.79	535	1250				178	214	22				2598	514				95	213					1.89	3.9					0.39						45						19						122	173	
280	4.5	854					147	98	23				4589	1352				41						1.74						0.4	6.63					32	35					19	11					147		
208	2.15	649					110	127.8	408	1431			5000	5000	>5000			24	70	88				1.13	1.47	1.55				0.9	1.23					27	54					41	56					287	290	430
162	13.09	702	394				341	211					4521	317				32						1.67						0.43						93						31						175		
208	4.40	552					210	193.5					4456					117						1.01						0.53						19						12						118		
210	5.05	306	739				147	57.9					2345					28						0.6						0.3						21						18						100		
250	3.24	489	416				169	102	3.54				2316	202				20						0.8						1.01						48						39						148		
300	4.11	1756					27	34					>5000					85						1.25						0.78						32						34						356		
280	9.46	377					210	187	18.03				>5000	356				46						0.88						0.39						35						26						433		
206	5.23	342			688		126.7	286.2			461		3429			>5000		42						0.94						0.78						32						28						245		
158	8.66	631					361	149.3					4567					43						0.98						0.49						32						24						212		
138	6.22	402					261	97.6					1023					116			45			1.25	1.57		0.73			0.9						647						228						312		
200	6.28	866					241	89.7					4658					69						0.86						0.67						58						14						170		
339	0.68	509	582				124	54	4.11				356	1541				32						0.73						2.62						54						37						174		
140	7.24	1113					126	93.8					>5000					18						0.88						0.98						46						40						258		
228	4.84	402					80	43					1030					31						0.9						0.98						29						19						126		
228	1.51	296	296				54	22.18					290					46						1.45						0.57						26						19						305		
102	11.63	656					193	78					1043					62						1.57						0.65						36						39						128		
260	1.03	1002					25	46.8					1320					54						1.35						0.65						32						47						165		
280	3.86	394	686				102	100		45.8	35.7		876					64	132					1.74	1.71					0.6						48	40					20	31					161	356	
168	10.63	371					652	241					4190					35						1.25						0.5						37						32						154		
138	7.34	969					231	145					3262					65						0.93						1.3						42						43						294		
130	9.32	789					245	115					2145					32						1.24						1.2						32						36						212		
140	10.24	709					269	145.8					>5000	686				51						1.71						0.74						92						56						214		
350	0.88	933					11	31					244					50						1.01						1.06						168						84						352		
180	12.88	476					321	113					3349					265						1.32						0.6						14						15						276		
280	5.05	750					114	26.6					1482					53						1.1						0.3						20						11						509		
396	1.86	364					214	97.51					500					79						1.55						0.2						12						14						498		
150	8.99	826	703	703	836		196	85	17.53	491.9	536		937	7748	1478	3679		34						1.01						0.5						55	29	26				23	14	14				158		
190	5.23	3650					79	120					>5000					139	181	240	336			3.52	4.14	5.91	6.22			1.2						7437						5318						214		
170	10.54	502	502				146	98.9	18.8	9.4			>5000	273				39		70				1.01		0.69				0.43						36						25						217		
280	3.03	217					54	109	191.3				573					23						0.78						0.78						50						34						188		
250	3.55	819					89	22.65		2604			1217	5000	5000			52						1.02						0.68						83						59						202		
160	5.77	842					67	23					765					41						1.1						0.32						24						31						298		
125	10.17	854					114	95.7					660					72	74	88				0.81	0.7	0.77				0.54	0.45					43	25					45						193		
250	3.53	280					28	57					328					32						0.85						0.33						23	24					12	14					212		
290	3.07	489					59	47					898					37						1.06						1.03						31						52						147		
120	12.56	502					213	89					>5000					140						1.09						1.22						68						34						208		
130	8.27	579					158	69					871					36						1.01						0.93						51	45					107	122					86		
198	10.10	670					142	168					3460					198						10.8						0.39						57						25						352		
102	6.32	1257					254	120					2789					89						1.06						1.2						68						51						329		
180	3.51	732	682				114	23.5	25.3				2233	1242				51						1.17	1.23					1.06						48	36					26	27					339		
260	4.34	243					66	45					1870					24						1.15						0.7						21						18						265		
200	5.08	675					109	40.9					2478	1523				48	50					0.78						0.43	1.18					35	25					15	19					103	101	
160	6.51	629					299	78.9					1528					55						0.81						0.44						21						16						300		
320	4.53	415					141	45.6					3349					142	166					11.2	9.01					0.4						80						47						367	337	
190	10.53	855					316.5	88.9					>5000					68						2.52						2.91						98						80						117		
250	0.19	527					21	32					4568					66						1.32						0.46						49						79						471		
149	9.00	416					314	43.3					3500					41						0.91						0.98						42						32						145		
283	5.40	683					252	43					1327					74						1.03						0.71						115						119						298		
162	6.99	538					250	72					4258					29						0.79						0.9						40						35						225		
188	3.02	885					199	54					1580					108						1.87						0.7						32						34						214		
268	3.61	820					180	39.6					4500					43						1.16						7.3						26						11						152		
228	7.01	857					227.5	127.5					1245					47						2.11						0.3						73						24						171		
250	3.99						88	98					1375																																					
271	3.27	456					134	42.9	42.9	550.3			2568	1423	1376			32	70					0.66	0.57					0.14						69	52					31	31	47				152		
168	7.68	971					241	88.8					>5000					29						1.25						0.56						42						18	18					165		
104	5.91	613					217	110					1193					46						1.05						0.79						64						39						249		
130	2.67	1089					56	47					1258					65						0.89						1						23						54						257		
128	12.23	442	490	718			200.4	124		202.5			>5000		1416			36						0.91		0.72				0.8						33		29				31		21				234		
148	10.64	606					189	149.4					968					149	159	103				2.4	2.16	1.6				0.8						23						15						298		
182	9.11	653		428			154	102					1781					158						7.28						8.26		6.75				99		60				64		61				45		
228	3.73	653	1320				42	46	27				666	5000				100						0.9						0.5						252						118						153		
164	18.52	140					212.6	198					>5000					66	69	94				1.41						1.09						77		113				32		58				179	191	235
202	10.68	712					210.3	154					4568					45						1.25						6.1						59	46					35						254		
168	4.82	765					108	70	4470	6753			>5000					102						1.39	1.39					0.91						21						49						256		
158	5.36	647					114	10.05					3141					42						1.79						0.56						32						58						247		
178	4.26	576					101.8	32					2147					32						0.92						0.6						22						15						128		
262	4.80	247					228.7	70					2301					65						1.22						0.53						20						29						358		
143	6.98	476					245.2	80.4	60.1				2145					47	47	130	189			0.95		1.57	2.52	3.95		0.62			1.41			94	36		116			26	30		114			410		410
206	6.73	410					47	62.9					1999					49						0.7						0.62						19						66						220		
246	5.24	511					89	60					3411					54	54					1.08	1.08	1.35	1.3	1.73		1.53						38						19						384	384	334
152	11.07	428	428				185.8	114.4					>5000	1608				36						0.91						1.02						31						16.9						159		
228	8.14	1478	1249				83	161.5					2314					25						0.96	1.63					1.1						92	18					20	37					210		
172	7.17	126.1					187	126					881					42						0.87						0.6						52						25						196		
192	11.15	733					271	183					>5000					185						2.69						0.96						37						34						234		
184	12.28	417			1411		306	132		843.6	1360		4987			>5000		91						1.37	0.73					1.23						72						32						65		
149	13.29	417	417		795		272	168.9			110.4		655		1402	994		41	53					1.37	0.91					0.61	0.3					33						23						140		
174	11.40	901					214	111.8					>5000					100	75					1.02						0.47						41						49						58		
198	5.16	869					217	56					3573					31						1.23	0.85					0.47						32						20						77		
176	7.13	869					200	85					4237					56						1.18						0.49						30						64						287		

								70									TREATMENT								OUTCOME				
RBS	RBS	RBS	HbA1c		Date #2	Date #3	Date #4	Mode of O2 (RBM,HFO,NIV, Ventilator) 1	2	3	FiO2 1	2	3	SpO2 1	2	3	Remdesivir (No. of Doses)	Tocilizumab (No. of Doses)	LMWH (Max Dose)	Unfractioned Heparin (Max Dose)	Type of Steroid used (MethylePred or dexa)	Max dose per day used	Alteplase (Doses)	Alteplase (Number of times Given)	Improved and discharged	Died	Worsend and AMA	Improved and AMA	Outcome Date
				25-07-2020				NIV			100			92			2		40MG		Methyl Pred	1G				25/8/20			25/8/20
				25-07-2020	01-08-2020	10-08-2020		NIV	NIV	NIV	60	80		97%	97%	90%	9	1	40mg		MethylPred	40mg				10-08-2020			10-08-2020
				27-07-2020	30-07-2020	03-08-2020		RBM	HFO	NIV	12L/MIN	60L/MIN	100%	92%	93%	91%	5	2	40MG		Methyl pred	40mg				04-08-2020			04-08-2020
				08-05-2020	09-05-2020			RBM	NIV		5L/MIN	100%		96%			3		40MG		Methyl pred	80mg				09-05-2020			09-05-2020
				28-07-2020	30-07-2020	08-08-2020		HFO	NIV	NIV	40L/MIN	80L/MIN	100%	92%	99%	90%	7	1	40MG		Methy pred	40mg				09-08-2020			09-08-2020
				21-08-2020	23-08-2020			HFO	NIV		60L/MIN	100%					2		40mg		Methy pred	80mg				23/08/2020			23/08/2020
				05-09-2020	09-09-2020			NIV	INTUBATION		100%	100%		98	99%		8		80MG		MethylP	1G	30MG	1		11-09-2020			11-09-2020
				04-09-2020	05-09-2020	16-09-2020		HFO	NIV	HFO	60L	100%	60L/min	94%	97%	93%	8	1	40MG		Methyl Pred	1 g		2		18/9/2020			18/9/2020
				20-08-2020	22-08-2020	23-08-2020		HFO	HFO	INTUBATION	60L/MIN	70L/MIN	100%	97	95%	91%	7	1	40MG		Methylpred	500mg				24-08-2020			24-08-2020
				23-08-2020				NRBM			10L			88%			NONE		40MG		MethylP	80MG				24/08/2020			24/08/2020
			10.1	27-07-2020	30-07-2020			HFO	NIV		60L/MIN	100%		96	90%		2	1	80MG		Methyl Pred	80mg				31/7/20			31/7/20
				13/8	17/8	20/8		HFO	NIV	NIV	50L	60	80	75%	98%	96%	9	2	80mg		MethylP	500MG				22/08/2020			22/08/2020
				28/8/20	29/8/20			NIV	NIV		100	100		95	92		2		80MG		MethylP	1G				29/8/20			29/8/20
				03-08-2020	05-08-2020			NIV	NIV		100	100		98	92%		6		40MG		DEXA	12MG				06-08-2020			06-08-2020
			6.5	04-09-2020				INTUBATED			100			92			1		80MG		METHYPRED	500MG				4-9-2020			4-9-2020
			8.2	10-08-2020				NIV			100			94			10	2	40mg		Methylpred	1gm				16/8/2020			16/8/2020
				14-08-2020				INTUBATED			100			98			4		40MG		METHYPRED	120MG				15/8/2020			15/8/2020
				11-09-2020	13-09-2020	14-09-2020		HFO	NIV	INTUBATED	80L/MIN	100%	100%	92	96%	98%	3		40MG		METHYPRED	1000GM				15/9/2020			15/9/2020
			10.7			11-08-2020				HFO	60L/MIN			86			2		40MG		DEXA	12MG				13/8/2020			13/8/2020
				30-07-2020	05-08-2020			NIV	INTUBATED		100			68			9	3	40mg		Methylpred	1g				8-8-2020			8-8-2020
				07-09-2020				NIV			100			89			5	1	40 MG		METHYPRED	1000MG				8-9-2020			8-9-2020
			9.8	27-08-2020	30-08-2020			NIV	INTUBATED		100	100		86	91%		5		40mg		Methylpred	500mg				1-9-2020			1-9-2020
				24-09-2020	25-09-2020	25-09-2020		RBM	HFO	NIV	15L/MIN	60L	100	89	92	89	1		40MG		Methylpred	500mg				25/9/2020			25/9/2020
			7.6	3-9-20				NIV			100			78			2		40MG		Methyl Pred	40MG				04-09-2020			04-09-2020
				07-09-2020				NIV			100			70			NONE		80mg		Mehtylpred	80				08-09-2020			08-09-2020
				24/9	25/9	29/9		HFO	RBM	NIV	30LMIN	15L/MIN	100	93	94	95	6				Methyl Pred	40mg	50MG	1		30/9/20			30/9/20
				10-09-20	11-09-20			NIV	NIV		100	100		92	95		2		40		Methylpred	1000 mg				11-09-2020			11-09-2020
				5-9-20	6-9-20	9-9-20		RBM	RBM	HFO	10L/MIN	15L/MIN	100	94	97	60%	5		40MG		Methylpred	500				10-9-20			10-9-20
				8-9-20				NIV			100			95			2		40		Methylpred	40				14/9/20			14/9/20
				25/7/20				NIV			100			90			2	6	40		Methylpred	40				1-8-20			1-8-20
				15/8/20	19-08-2020			HFO	NIV		60	100		93			4	2	80		Methylpred	500				21/08/2020			21/08/2020
				10-09-2020	12-09-2020	13-09-2020		NIV	NIV	NIV	100	100	100	97	90	86	5		40		Methylpred	1g				14/9/20			14/9/20
				27-07-2020	29-07-2020			RBM	NIV	NIV	10L/MIN	100	100	88	92	96	5		40		Methylpred	80MG				30-07-2020			30-07-2020
				19/9	24/9	26/9		NIV	NIV	NIV	100	100	100	92	84	80	11	1	80		Methylpred	500				26/9/2020			26/9/2020
				17-08-2020				NIV	INTUBATED		100	100		76	84		5		80		Methylpred	1g	50mg	1		23/09/2020			23/09/2020
				21/8	25/8	26/8		RBM	NIV	NIV		90	90	84	92	92	2		80		Methylpred	1g				27/08/2020			27/08/2020
			6.9	29/8	31/8	02-09-2020		NIV	NIV	NIV	100	80	100	93	96	84	5		80		Methylpred	1g				02-09-2020			02-09-2020
				16/8	18/8	19/8		RBM	RBM	HFO	10L/MIN	15L/MIN	60L/MIN	94	89	70	2		80		Methylpred	500				20/08/2020			20/08/2020
				31-08-2020	01-09-2020			NIV	NIV		100	100		94	94		5		40		Methylpred	1g				01-09-2020			01-09-2020
				24-08-2020	29-08-2020			NIV	INTUBATED		100	100		94	96		NONE		80		Methylpred	1g				25/08/2020			25/08/2020
				17/8	18/8			HFO	NIV		60	90		80	90%		3	1	40		Methylpred	1g				21/08/2020			21/08/2020
				31/8				NIV			100			94			1									31/8/20			31/8/20
				27/8	28/8			NIV	NIV		100	100		92	60		7		40		Methylpred	1g				29/08/2020			29/08/2020
				16/08	17-08-2020			HFO	INTUBATED		60	100		90			3		80		Methylpred	120				17/08/2020			17/08/2020
				12-8	13/8	14-08-2020		RBM	RBM	NIV	15L/MIN	15L/MIN		100	100	92	4		40		DEXA	12				15/8/20			15/8/20
				5-8	7-8	14/8		NIV	NIV	NIV	60	100	50	94	96	92	9	1	40		Methylpred	120				14/08/2020			14/08/2020
				26-08-2020	27-08-2020			HFO	NIV	NIV	60	100	100	91	92	88	2		40		Methylpred	1GM				25/8/20			25/8/20
				30-08-2020	01-09-2020			NIV	INTUBATED		100	100			90	100	NONE		40		Methylpred	80				01-09-2020			01-09-2020
				18-08-2020	20-08-2020			NIV	NIV		100	100		92	90		3		120		Methylpred	40				20/8/20			20/8/20
				13-08-2020				INTUBATED			100			88			1		40		Dexa	24				13/08/2020			13/08/2020
				25-08-2020	26-08-2020	27-08-2020		HFO	NIV	INTUBATED	60	100	100	90	99	92	5		40		Methylpred	120				28/08/2020			28/08/2020
				29-08-2020	01-09-2020			NIV	INTUBATED		80	90		93	92		4		40		Methylpred	80	40	1		02-09-2020			02-09-2020
				20-08-2020	21-08-2020	22-08-2020		RBM	NIV	INTUBATED	10L/MIN	100	100	86	94	96	3		40		methylpred	40				22/08/2020			22/08/2020
				11-09-2020				INTUBATED			100			88			2		40		Methylpred	1g				12-09-2020			12-09-2020
				22-08-2020				NIV			100			82			NONE		40		Methyl Pred	40mg				23/08/2020			23/08/2020
				14/9/20	17-09-2020			CPAP	INTUBATED		100	100		90	96		4		40		Methylpred	1g				18/9/20			18/9/20
																										2-8-20			2-8-20
				13/8/20	15/8/20	17/8/20	18/8/20	NIV	NIV	NIV	60	80	40	100	98	96	5	2	80		methylpred	500				18/8/2020			18/8/2020
				19/9/20	20/9/20			RBM	NIV		15L/MIN	100		56	96		2		40		methylpred	500				20/9/20			20/9/20
				12-09-2020	13-09-2020			NIV	INTUBATED		90	100		98	96		3		80		methylpred	1g				13/9/20			13/9/20
				10-09-2020				INTUBATED			100			88			3		80		methylpred	1g				11-9-20			11-9-20
				18/8	21/8	22/8		HFO	NIV	NIV	40	100	100	90	80	90	5	2	80		methylpred	1G	50	1		23/8/20			23/8/20
				25/8	27/8	29/8	31/8	NIV	NIV	RBM		50	12	100	100	93	5		80		methylpred	500				1-9-20			1-9-20
				14-09-2020	16-09-2020	18-09-2020		RBM	NIV	INTUBATED	15L/MIN	100	100	75	92	91	NONE		40		methylpred	120MG				19/9/20			19/9/20
				10-9-20	11-9-20	18/9/20		OS MASK	HFO	NIV	5L/MIN	50L/MIN	100	93	91	94	11		40MG		methylpred	500MG		2		20/9/2020			20/9/2020
				10-08-2020	11-08-2020	12-08-2020		RBM	NIV	NIV	100	100	100	93	99	94	4		40MG		methylpred	500MG				12-8-20			12-8-20
				06-08-2020				INTUBATED			100			56			NONE		40MG		Methyl Pred	500mg				7-8-20			7-8-20
				16-08-2020	19-08-2020	20-08-2020		HFO	NIV	INTUBATED	60L/MIN	100	100	70	98	90	4	1	40MG		Methyl Pred	500MG				20/8/20			20/8/20
				17-09-2020	20-09-2020	22-09-2020		HFO	NIV	INTUBATED	50L/MIN	100	100	92	91	96	7	6	80mg		Methypred	1g	50mg	2		23/9/2020			23/9/2020
			6.8	19/9	21/9	22/9	24/9	HFO	HFO	HFO	40	50	50	91	99	94	12	2	80mg		Methylpred	500	40	1		1-10-20			1-10-20
			11.1	18/8/20	19/8/20			NIV	NIV	INTUBATED	100	100	100	98	98	85	2		40mg		Methylpred, Dexa	1GM				20/8/20			20/8/20
702				22/8/20	24/8/20	26/8/20	2-9-20	RBM	NIV	NIV		90	70	97	97	94	12	2	80MG		Methylpred	1000mg				3-9-20			3-9-20
			10	14/9/20	16-09-2020			NIV	INTUBATED		100	100		76	92		5	1	40		Methylpred	1000mg	40mg	2		17/9/20			17/9/20
392	504			06-08-2020	10-08-2020			RBM	NIV			100		83	90		5		80		Mehtlypred	500				12-8-20			12-8-20
				10-08-2020	12-08-2020			HFO	NIV		60	100		90			2	1	40		Methylpred	500				14/8/20			14/8/20
				11-08-2020	12-08-2020	13-08-2020		NIV	NIV	NIV	100	70	60	92	93	99	4		80mg		Methylpred	500				15/08/20			15/08/20
				21-09-2020	22-09-2020			NIV	INTUBATED		100	100		92	94		3		40		Methylpred	500	50	1		23/9/20			23/9/20
				2-10-2020	03-10-2020			RBM	NIV		15L/MIN	100		85	92		1		120mg		Methylpred	500mg				3-10-2020			3-10-2020
					16/9				NIV			80			96		6	2	80mg		Methylpred	1gm	40mg	1		20/9/2020			20/9/2020
				10-10	17/10	18/10		NIV	NIV	NIV	80	100	100	96	90	88	10		60mg		Methylpred	500mg	40mg	1		19/10/2020			19/10/2020
				28-09-2020	01-10-2020			NIV	INTUBATED		100	100		96	92		4		80MG		Methylpred	40mg				02-10-2020			02-10-2020
				12-9-2020	15-09-2020			HFO	NIV		60L/MIN	100		88	90		7	1	80mg		Methylpred	1g		1		18/9/2020			18/9/2020
				29/7/2020	01-08-2020			HFO	NIV		60L/MIN	NIV		83	100		6	2	80mg		Methylpred	80mg				03-08-2020			03-08-2020