A Dissertation on

"UTILITY OF QUICK COVID-19 SEVERITY INDEX IN PREDICTING EARLY CLINICAL DECOMPENSATION IN HOSPITALIZED PATIENTS WITH COVID-19"

Submitted in partial fulfillment of requirements for

M.D. DEGREE BRANCH – I

GENERAL MEDICINE

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CHENNAI

INSTITUTE OF INTERNAL MEDICINE

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CERTIFICATE - I

This is to certify that the dissertation entitled **"UTILITY OF QUICK COVID-19 SEVERITY INDEX IN PREDICTING EARLY CLINICAL DECOMPENSATION IN HOSPITALIZED PATIENTS WITH COVID -19"** is a bonafide original work done by **Dr.PALANISAMY.S**, registration number **201911015** in partial fulfillment of the requirements for M.D. GENERAL MEDICINE (BRANCH-I) examination of the Tamilnadu Dr.M.G.R Medical University to be held in May 2022, under my guidance and supervision during the academic year 2019 - 2022.

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CERTIFICATE – II

This is to certify that this dissertation work titled "**UTILITY OF QUICK COVID-19 SEVERITY INDEX IN PREDICTING EARLY CLINICAL DECOMPENSATION IN HOSPITALIZED PATIENTS WITH COVID-19**" of the candidate **Dr. PALANISAMY.S** with registration Number **201911015** for the award of M.D in the branch of General Medicine. I personally verified the urkund.com website for the purpose of plagiarism Check. I found that the uploaded thesis file contains from introduction to conclusion pages and result shows 5 percentage of plagiarism in the dissertation

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DECLARATION BY THE CANDIDATE

I, **Dr.PALANISAMY.S,** Registration number **201911015** hereby solemnly declare that the dissertation entitled "**UTILITY OF QUICK COVID-19 SEVERITY INDEX IN PREDICTING EARLY CLINICAL DECOMPENSATION IN HOSPITALIZED PATIENTS WITH COVID-19"** was done by me at the Institute of Internal Medicine, Madras Medical College & Rajiv Gandhi Government General Hospital, Chennai during the academic year 2019-2022 under the guidance and supervision of **Prof. DR.A.SAMUEL DINESH, M.D.,** This dissertation is submitted to The Tamilnadu Dr. M.G.R Medical University, Chennai towards the partial fulfilment of requirement for the award of M.D. Degree in General Medicine (Branch I)

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ABSTRACT

BACKGROUND :

To assess the performance of quick covid-19 severity index in predicting early clinical decompensation in the form of increased oxygen requirement to 10 L or more, high flow oxygen, non-invasive or invasive ventilation, or death in covid 19 patients which will help in better patient triage as the possibility of next wave is imminent because of considerable variations in the virus.

OBJECTIVES :

1. To study the utility of the quick covid-19 severity index in predicting early hospital respiratory failure(within 24 hrs of admission) in patients admitted with covid-19 in Rajiv Gandhi Government General Hospital.
2. To correlate quick covid-19 severity index score with CT severity score in patients admitted with covid-19.

METHODS :

In this prospective observational study, during admission of covid-19 patients, respiratory rate, pulse oximetry saturation, and oxygen flow rate in L/min via face mask were entered and quick covid-19 severity index score was calculated using these variables. The patients were then assigned to four risk strata and monitored for the next 24 hrs to look for early clinical decompensation. During admission, CT chest was also done which was then correlated with quick covid-19 severity index to see if there was any association between them.

RESULTS :

Quick covid-19 severity has sensitivity 48.46 % ; specificity 91.43% ;positive predictive value 91.30% .negative predictive value 48.85 % with significant p-value of < 0.0001 in predicting early clinical decompensation. None of the patients in this study group deteriorated severe enough to put them in invasive or non-invasive ventilation and also no death in this study group during 24 hours of observation. On CT chest grading,37 % of patients had grade 3 pneumonia followed by 31 % had grade 2,20.5 % had grade 1 and 11.5 % had grade 4.

CONCLUSION :

The quick covid-19 severity index is a very useful clinical tool that can predict early clinical decompensation of covid-19 patients with high specificity and positive predictive value, even though the score has low sensitivity and low negative predictive value. However, the score did not correlate with the CT severity score.

Keywords: quick covid-19 severity index, early clinical decompensation, patient triage, CT chest grading

INTRODUCTION

In December 2019, the first pneumonia cases of unknown origin were identified in Wuhan, the capital city of Hubei province. The pathogen has been identified as a novel enveloped RNA betacoronavirus2 that has been named later as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (1,2).WHO declared covid-19 disease as public health emergency of international concern on January 30 , 2020 and later declared as a global pandemic on 11 March 2020. (3) Since then covid has produced significant morbidity and mortality all over the world.

The first two waves of covid led to a public health crisis in both developing and developed countries particularly in developing countries like India the effect was too obvious. On account of considerable variations in the virus which can at any point in time can lead to the next wave, disaster preparedness is essential, because hospitals are not designed to handle this type of pandemic.(4)

Proper triaging in an emergency department is essential for optimal care to the patients. Patients requiring high flow oxygen, invasive and non invasive ventilation will be admitted to ICU wards and intermediate ICU wards directly. At the same time, patients requiring less oxygen requirement at the time of admission will be admitted to non ICU wards. It is observed that in the previous two waves, a significant proportion of patients who were admitted in non ICU

wards deteriorated within 24 to 48 hrs of admission and had to shift them to ICU wards (5,6).Hence a proper scoring system is needed to find those patients who deteriorate early and admit them in ICU or intermediate ICU and should be monitored carefully.

Various scores such as Pneumonia Severity Index (PSI), CURB-65, CRB 65, A- DROP, SMART-COP, NEWS2,qSOFA, Brescia covid respiratory severity scale, and quick covid severity index(qCSI) were proposed to detect patients at high risk. Most of the scoring systems are designed to detect circulatory collapse rather than respiratory failure which is seen in covid-19. (7) Out of that quick covid severity index is of particular interest as it is a simple bedside scoring test that uses three variables such as respiratory rate, pulse oximetry saturation and oxygen flow rate in L /min and also it showed good performance in predicting ICU admissions.

The performance of this score in our population is not established. Being simple bedside score which includes variables we regularly use in our wards, this study aims to know the usefulness of this score in predicting early clinical decompensation in patients who are admitted with covid-19.

AIMS AND OBJECTIVES

1. To study the utility of quick covid19 severity index in predicting early hospital respiratory failure(within 24 hrs of admission) in patients admitted with covid-19 in Rajiv Gandhi Government General Hospital.

2. To correlate quick covid severity index score with CT severity score in patients admitted with covid-19.

REVIEW OF LITERATURE

Infectious diseases have emerged as major threats to human lives for centuries and can affect a wide range of the population. In the last 100 years, we have encountered several outbreaks mostly due to viruses. The twentieth century began with the outbreak of the pandemic H1N1 influenza virus in 1918, affecting one-third of the world's population (8) and is known as the most deadly pandemic in the history of mankind and that was not the last to do so.

Exactly after a century, in December 2019, China reported an outbreak of pneumonia without any identifiable cause in Wuhan. Initially, these cases were appeared to be linked to the seafood wholesale market and considered to be zoonotic. On testing the lower respiratory tract samples of these patients, an unknown Beta coronavirus was discovered and named as 2019–novel Coronavirus (2019–nCoV).

The virus when observed under an electron microscope had a diameter of 60 to 140 nm with characteristic spikes of 9 to 12 nm, similar to the Coronoviridae family. Phylogenetically, the novel coronavirus was found to be more similar to two bat-derived coronavirus strains (~88% similarity) than coronaviruses that infect humans including SARS (~79% similarity) and MERS (~50% similarity).

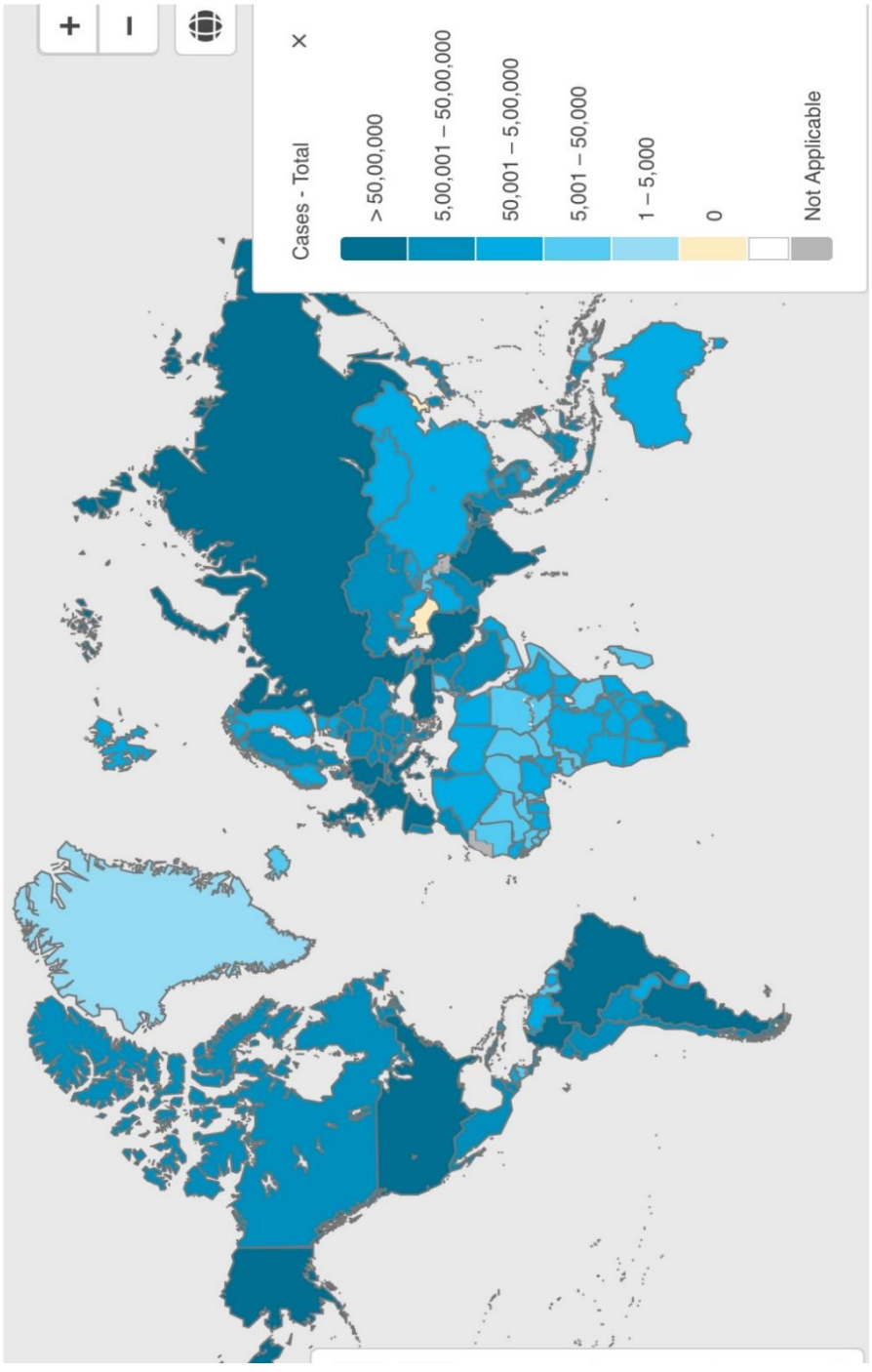
On February 11, 2020, the Coronaviridae study group of the International Committee on Taxonomy of Viruses named the virus SARS–CoV2. The World Health Organization (WHO) named the resultant disease Coronavirus disease (COVID-19). On March 11, 2020, WHO, after assessing the situation across the globe, declared COVID-19 as a pandemic. (3)

Within a short period since the initial report from China, the disease spread rapidly, and the number of cases increased exponentially. On January 11, the first case was reported outside mainland China in Thailand and within months, the disease spread to all the continents except Antarctica. As of December 13, 2021, a total of 269 468 311 laboratory-confirmed cases had been documented globally including 5 304 248 deaths. (9)

INDIAN PERSPECTIVE :

- India reported its first case of COVID-19 on January 30, 2020, in Kerala.
- The first COVID-19 related death in India was reported on March 12, 2020.
- The first covid case in Tamil Nadu was reported in March 7, 2020.
- On March 24, 2020, the Indian Government put a nationwide lockdown for 21 days as a preventive measure against covid-19.(10)
- Despite this, Over a short period, the numbers grow exponentially which placed India in second place in confirmed covid cases next to America.
- . Tamil Nadu confirmed about 2.7 million cases of the coronavirus (COVID-19) as of December 13, 2021, with over 36 thousand fatalities. (11).

MAP SHOWING GLOBAL DISTRIBUTION OF COVID :



CASE DEFINITIONS BY WHO : (12)

Suspected case of SARS-CoV-2 infection

A A person who meets the clinical **AND** epidemiological criteria:

Clinical Criteria:

- Acute onset of fever AND cough; OR
- Acute onset of **ANY THREE OR MORE** of the following signs or symptoms: Fever, cough, general weakness/fatigue[1], headache, myalgia, sore throat, coryza, dyspnoea, anorexia/nausea/vomiting[1], diarrhoea, altered mental status.

AND

Epidemiological Criteria:

- Residing or working in an **area with high risk of transmission of virus**: closed residential settings, humanitarian settings such as camp and camp-like settings for displaced persons; anytime within the 14 days prior to symptom onset; or
- Residing or travel to an **area with community transmission** anytime within the 14 days prior to symptom onset; or
- Working in **any health care setting**, including within health facilities or within the community; any time within the 14 days prior of symptom onset.

B A patient with **severe acute respiratory illness:**
(SARI: acute respiratory infection with history of fever or measured fever of ≥ 38 C°; and cough; with onset within the last 10 days; and requires hospitalization).

C Asymptomatic person not meeting epidemiologic criteria with a **positive SARS-CoV-2 Antigen-RDT[2]**

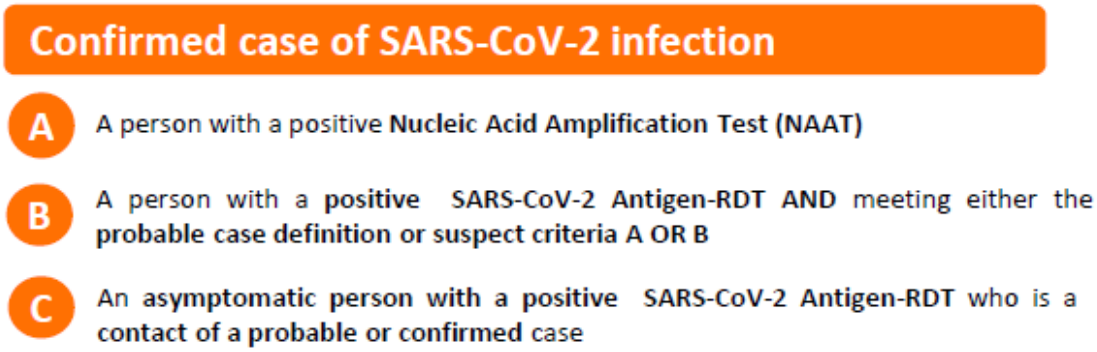
Probable case of SARS-CoV-2 infection

A A patient who meets **clinical criteria** above **AND** is a **contact of a probable or confirmed case**, or linked to a **COVID-19 cluster[3]**

B A **suspect case with chest imaging** showing findings suggestive of COVID-19 disease[4]

C A person with recent onset of **anosmia** (loss of smell) or **ageusia** (loss of taste) in the absence of any other identified cause.

D **Death**, not otherwise explained, in an adult with **respiratory distress** preceding death AND **was a contact of a probable or confirmed case** or linked to a **COVID-19 cluster[3]**



VIRAL TRANSMISSION :

Many domestic and wild animals, including camels, cattle, cats, and bats, may serve as hosts for coronaviruses. Generally, animal coronaviruses do not spread among humans. Even though it can happen due to spillover but it will be the dead end for the virus. (13) However, there are exceptions, such as SARS and MERS, which are mainly spread through close contact with infected people via respiratory droplets from cough or sneezing. Initially, covid19 was said to be zoonotic in origin but because of cases reported among medical staff and others with no history of exposure to that market or visiting Wuhan, gave a clue about human-to-human transmission.

ROUTES OF TRANSMISSION :

1) droplets transmission,
2) contact transmission, and
3) aerosol transmission.

DROPLET TRANSMISSION :

Droplets transmission occurs when respiratory droplets are produced by an infected person when coughs or sneezes are ingested or inhaled by individuals in close proximity.

CONTACT TRANSMISSION :

contact transmission occurs when a person touches a surface or object contaminated with the virus and subsequently touches their mouth, nose, or eyes.

AEROSOL TRANSMISSION :

aerosol transmission occurs when respiratory droplets mix into the air, forming aerosols and cause infection when inhaled high doses of aerosols into the lungs in a relatively closed environment.

In addition to these routes, feco oral route was also suspected since patients had abdominal discomfort and diarrhea symptoms.

FACTORS DETERMINING THE RISK OF GETTING INFECTION : (14)

1. concentration of virus in the air

2. life span of virus in that environment

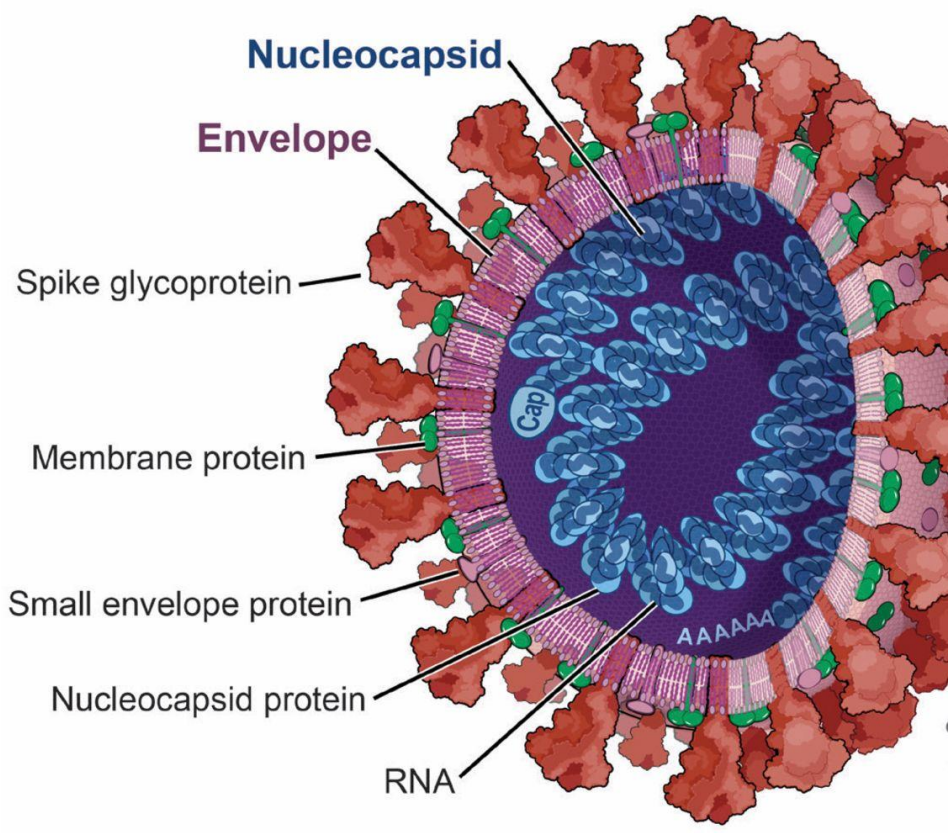
3. closed spaces without adequate ventilation

4. exposure time

VIRAL CELL CYCLE AND HOST CELL INVASION : (15)

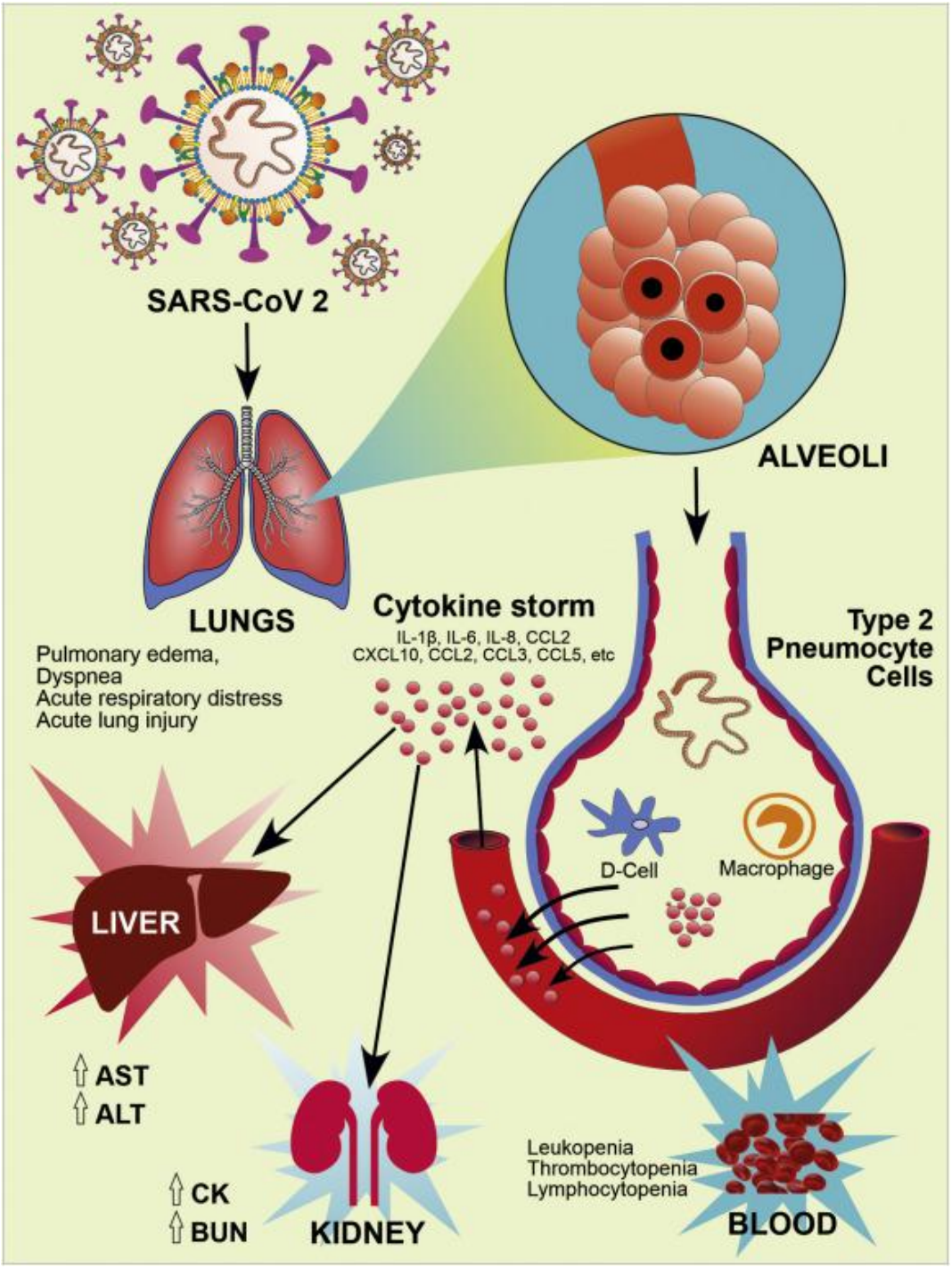
The virus is transmitted from one person to another through one of the above three mechanisms. once entered into the body, the virus binds to host receptors and enters the host cell through endocytosis or membrane fusion. The virus is made up of four structural proteins. Of these, the role of spike protein (S) which is seen to be protruding from the viral surface is the most important for host attachment and penetration. Spike protein has two subunits S1 and S2, among which S1 is responsible for binding to the host cell receptor and S2 is responsible for the fusion of viral and host cellular membranes.

ACE -2 is the functional receptor for coronavirus and it is expressed abundantly in pulmonary epithelial cells. The virus bind to the ACE -2 receptor through the S1 subunit and with the help of S2, it enters the pulmonary epithelial cells and viral contents are released. After that virus starts to replicate and produces a negative RNA strand through RNA polymerase activity. This negative RNA strand serves to produce new strands of positive RNAs. This produces new viral proteins in the cell cytoplasm and nucleocapsids are formed which are released into the extracellular space via exocytosis. These fresh new viral particles may invade the adjacent epithelial cells and also provide fresh infective material for community transmission via respiratory droplets.



DISEASE PATHOPHYSIOLOGY : (16)

After binding of the inhaled SARS-COV2 to the epithelial cells via ACE2 receptor, viral replication and local propagation occur with a limited immune response. In about four-fifth of patients, infection is contained and viral clearance occurs in 10 – 14 days. But in one-fifth of patients infections extend to the lower respiratory tract and involve type Ⅱ pulmonary alveolar epithelial cells via ACE2. The resultant process leads to cytokine storm with the release of IL-1, IL-6, IL-10, etc. The sequestration of inflammatory cells in the lung tissues with CD8 mediated cytotoxicity leads to diffuse alveolar damage with resulting acute respiratory distress syndrome (ARDS).


SARS-CoV 2
ALVEOLI
LUNGS
Pulmonary edema,
Dyspnea
Acute respiratory distress
Acute lung injury
Cytokine storm
IL-1β, IL-6, IL-8, CCL2
CXCL10, CCL2, CCL3, CCL5, etc
Type 2
Pneumocyte
Cells
D-Cell
Macrophage
LIVER
AST
ALT
CK
BUN
KIDNEY
Leukopenia
Thrombocytopenia
Lymphocytopenia
BLOOD

CLINICAL FEATURES :

The clinical spectrum ranges from patients without any symptoms to severe illness which can lead to death. The incubation period of covid-19 which is defined as the time from exposure to the virus to symptom onset is 5 – 6 days but can be up to 14 days.

SYMPTOMATOLOGY : (17)

Symptoms can be constitutional, pulmonary, and extrapulmonary.

General symptoms :

- cough (50 %)
- fever (43 %)
- myalgia or fatigue
- headache
- dyspnea
- sore throat
- diarrhea
- nausea and vomiting
- loss of taste and smell
- rhinorrhea

EXTRAPULMONARY MANIFESTATIONS :

CARDIAC :

- myocardial ischemia
- myocardial injury

- myocarditis
- cardiac arrhythmias
- cardiogenic shock

THROMBOEMBOLISM :

- deep vein thrombosis
- pulmonary embolism
- catheter-related thrombosis

NEUROLOGIC :

- headache
- dizziness
- encephalopathy
- Guillian barre syndrome
- acute cerebrovascular accident
- anosmia
- myalgia

RENAL :

- acute kidney injury
- proteinuria
- hematuria

GASTROINTESTINAL :

- diarrhea
- nausea/vomiting
- anorexia

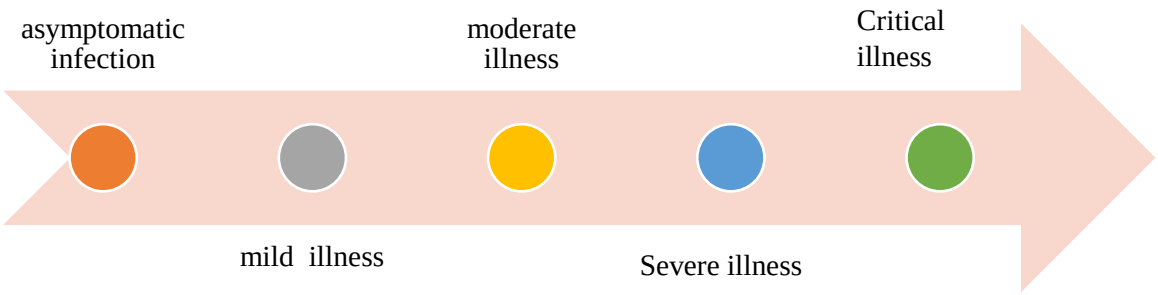
ENDOCRINE :

- hyperglycemia
- diabetic ketoacidosis

DERMATOLOGICAL :

- petechiae
- livedo reticularis
- erythematous rash
- urticaria
- pernio-like lesions (covid toe).

CLINICAL SPECTRUM : (17,18)



ASYMPTOMATIC PHASE :

In this phase patient will not have any clinical symptoms and but nasal swabs can be positive. a chest x-ray taken during this period will be normal.

MILD ILLNESS :

Patients with mild illness may exhibit a variety of signs and symptoms such as fever, cough, sore throat, malaise, headache, myalgia, nausea, vomiting, diarrhea, loss of smell and taste. They do not have shortness of breath, dyspnea on exertion, or abnormal imaging. Most of the mildly ill patients can be managed in an ambulatory setting. No imaging or specific laboratory evaluations are routinely indicated in otherwise healthy patients with covid-19.

MODERATE ILLNESS :

Moderate illness is defined as evidence of lower respiratory tract disease during clinical assessment such as complaints of breathlessness, respiratory rate $\geq$ 24/min or spo2 90% to $\leq$ 93% on room air, and chest x-ray showing bilateral lung infiltrates involving $\leq$ 50% of lung fields. Patients with the moderate disease should be closely monitored.

SEVERE ILLNESS :

Severe illness is defined as covid-19 patients with any one of the following such as respiratory rate > 30/min or spo2 < 90% on room air .chest x-ray shows bilateral lung infiltrates involving $\geq$ 50% of lung fields. These patients may experience rapid clinical deterioration. This stage requires oxygen support which can be invasive or non-invasive.

CRITICAL ILLNESS :

Critically ill patients may have acute respiratory distress syndrome, septic shock that may represent virus-induced distributive shock, cardiac dysfunction, an exaggerated inflammatory response, and/or exacerbation of underlying conditions. In addition to pulmonary disease patients with critical illness may also experience cardiac, hepatic, renal, central nervous system, or thrombotic disease.

PATIENTS WITH A HIGHER RISK OF PROGRESSING TO SEVERE COVID19 .(19).

- age $\geq$ 65 yrs
- pre-existing cardiovascular disease
- chronic lung disease
- diabetes mellitus
- obesity
- chronic kidney disease
- oncological conditions
- pregnancy
- transplant recipient
- on immunosuppressive therapy
- chronic smoker.

IMMUNITY FOLLOWING INFECTION :

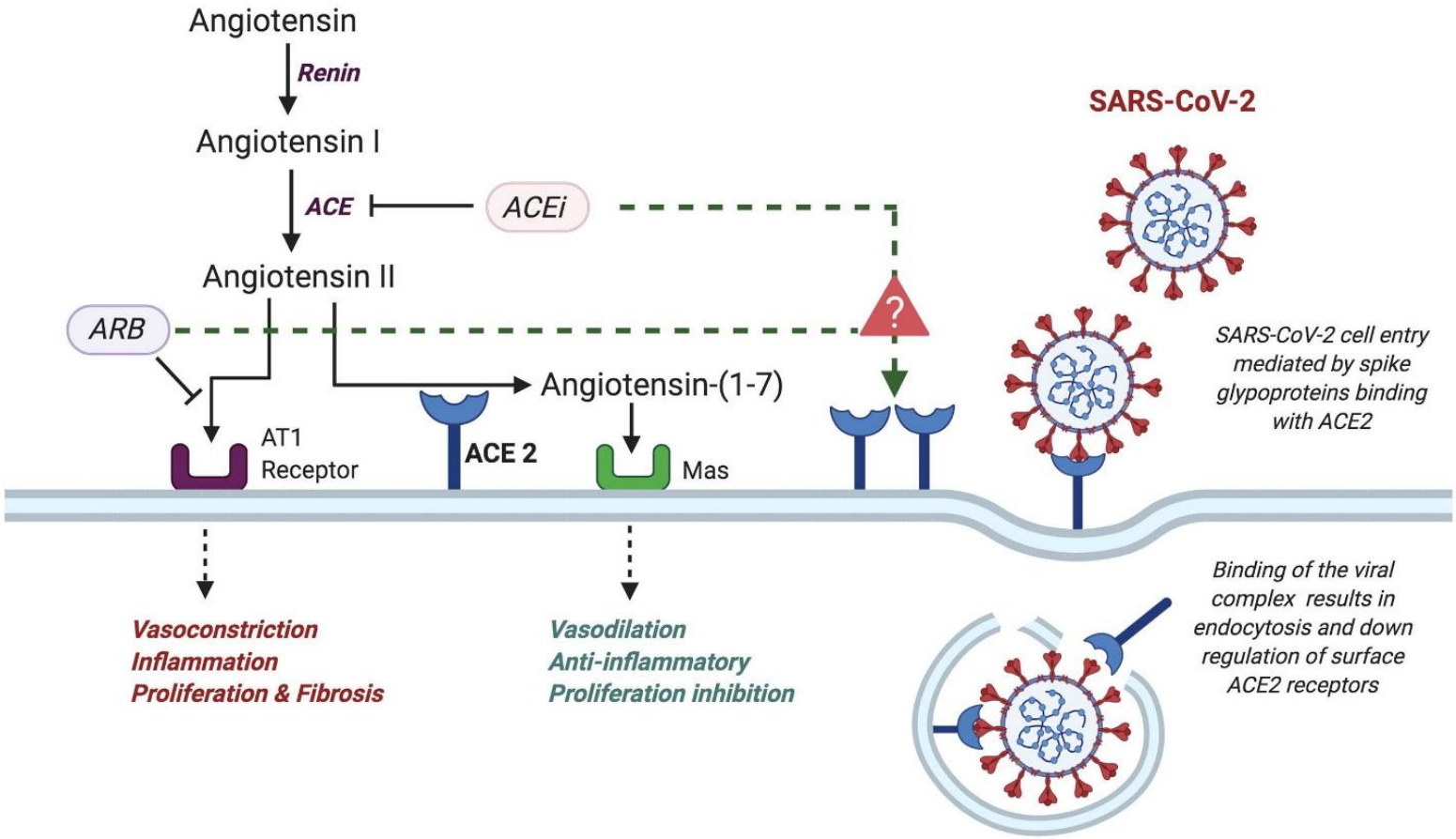
Most of the patients recovered from covid-19 had detectable serum antibodies to the receptor-binding domain of the viral spike protein. The magnitude of the antibody response may be associated with the severity of the disease.

Antibody response usually declines over several months after infection. Mostly the neutralizing activity is retained for six to eight months after infection.

Lumley et al reported that in a study of 12,541 health care workers who had undergone anti-spike antibody testing, those who had the presence of anti-spike or anti-nucleocapsid IgG antibodies were associated with a significantly reduced risk of covid reinfection in the next 6 months. (20)

COVID AND HYPERTENSION :

Gao C et al studied 2877 hospitalized patients in China, out of that population 29.5 % had hypertension. They also explained that hypertension increases the morbidity and mortality of patients' rate by twofold. In addition to that regarding discontinuation of ACE 2 inhibitors, there is no proven benefit by stopping ACE 2 inhibitors which will be detrimental to the patient. Benefit overweighs against discontinuation of drugs. (21)


Angiotensin
Renin
Angiotensin I
ACE
ACEi
Angiotensin II
ARB
?
Angiotensin-(1-7)
AT1
Receptor
ACE 2
Mas
Vasoconstriction
Inflammation
Proliferation & Fibrosis
Vasodilation
Anti-inflammatory
Proliferation inhibition
SARS-CoV-2
SARS-CoV-2 cell entry mediated by spike glypoproteins binding with ACE2
Binding of the viral complex results in endocytosis and down regulation of surface ACE2 receptors

COVID AND DIABETES :

Diabetes is known for increasing the risk of infections through the alteration of innate and acquired immunity. Uncontrolled diabetes worsens the outcome of infection and infection can worsen the glycemic status which goes on like a cycle. It's the same in covid-19 infection too.

Meta-analysis has shown the prevalence of diabetes among covid patients ranges from 9.7 to 35.5%. Kumar et al in their study of 16003 patients observed a two-fold rise in mortality and severity of covid infection in diabetic patients than non-diabetic covid patients. (22)

In another study by Fadini et al observed that diabetes worsens the covid infection and leads to increased ICU admissions and mortality. (23)

PATHOPHYSIOLOGY OF DIABETES AND SEVERE COVID :(24)

Pathophysiology is mostly related to the following mechanisms.

1. Viral load
2. Dysregulated immune response and cytokine storm
3. Alveolar dysfunction
4. Endothelial dysfunction
5. Coagulopathy

VIRAL LOAD :

Rimesh pal and Anil Bhansali explained that patients with diabetes mellitus may have increased ACE 2 receptor expression which is needed for viral entry and subsequently facilitate the infection. (25)

DYSREGULATED IMMUNE RESPONSE AND CYTOKINE STORM :

Patients with diabetes usually have low-grade inflammation and this in addition to covid-19 infection facilitates the recruitment of macrophages, monocytes, and T cells promotes further inflammation, and lead to ARDS.

ALVEOLAR AND ENDOTHELIAL DYSFUNCTION :

Diabetes through infecting ACE 2 receptor and leads to endothelial dysfunction and increasing permeability of pulmonary vasculature and reduces the gas exchange.

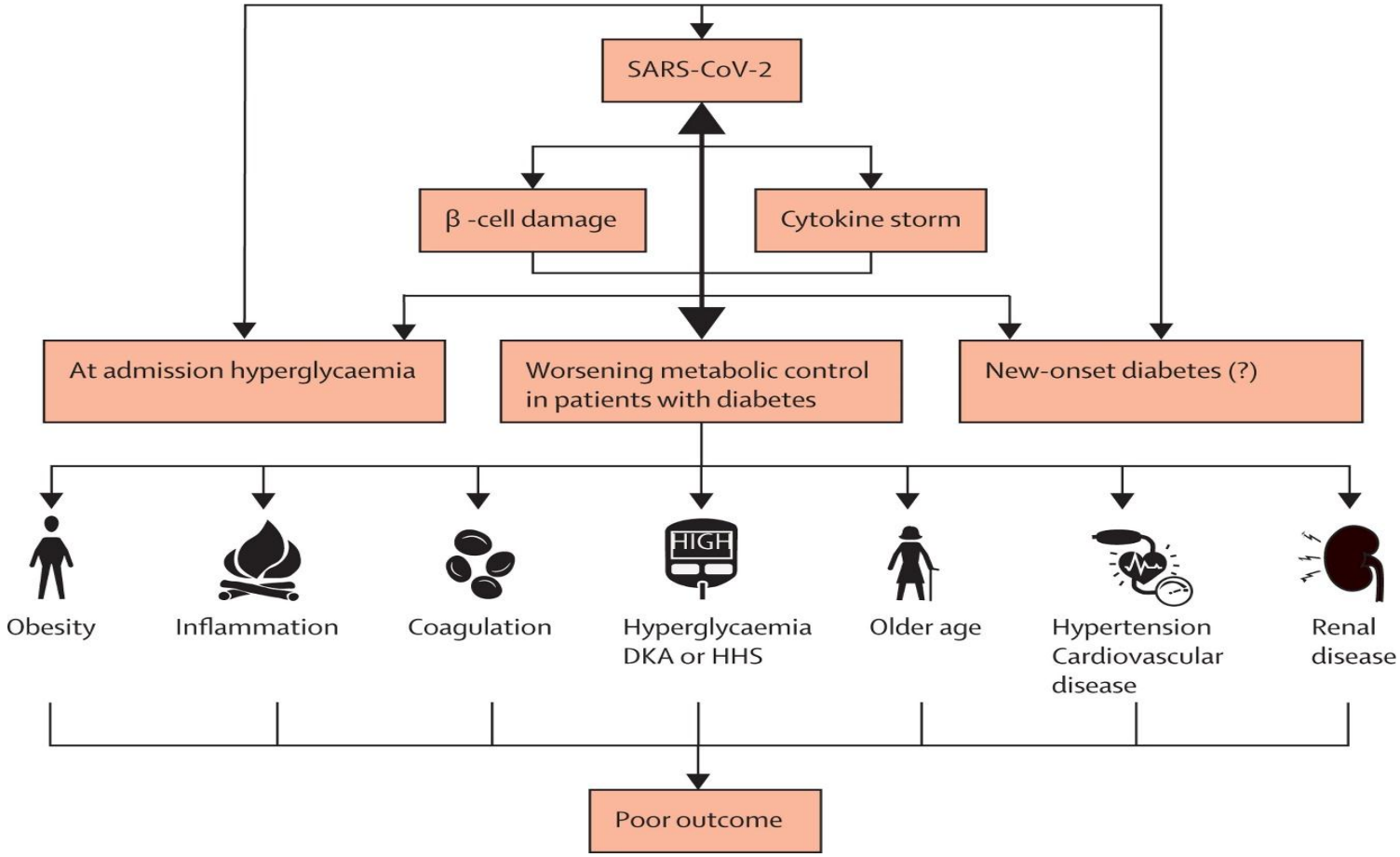
COAGULOPATHY :

Diabetes in addition to a hyperinflammatory state increases coagulability and stasis and can lead to thromboembolic events such as myocardial infarction .stroke, deep vein thrombosis, and pulmonary embolism.

POSTCOVID-19 HYPERGLYCEMIA : (26)

Following are the factors responsible for hyperglycemia in a previously non-diabetic patient.

- Stress increases the release of glucocorticoids and catecholamine into circulation and alters glycemic control.
- Pancreatic islet cell injury due to viral invasion through ACE 2 receptor
- May be due to the effect of steroids used in covid management

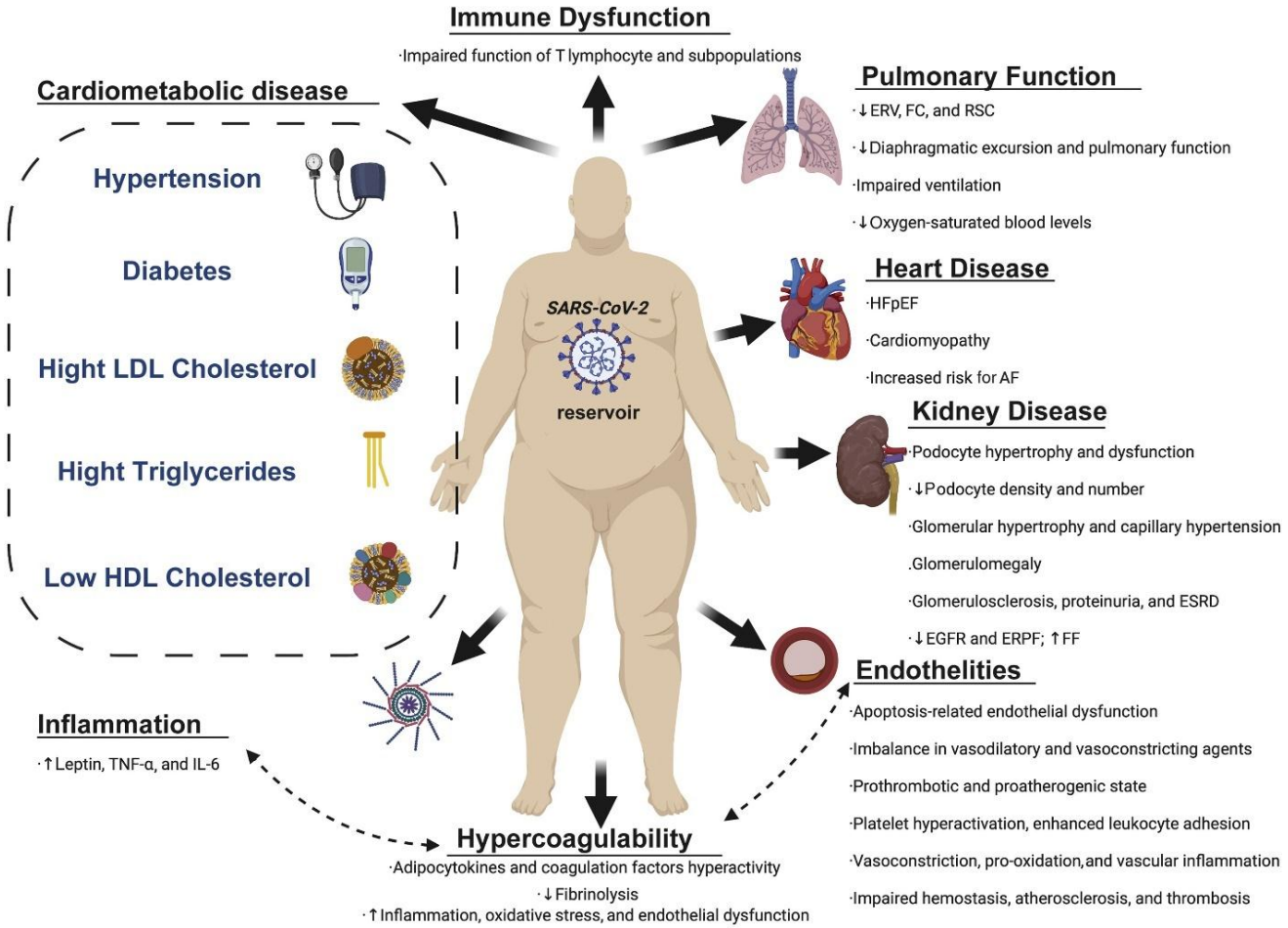

SARS-CoV-2
β -cell damage
Cytokine storm
At admission hyperglycaemia
Worsening metabolic control in patients with diabetes
New-onset diabetes (?)
HIGH
Obesity
Inflammation
Coagulation
Hyperglycaemia DKA or HHS
Older age
Hypertension Cardiovascular disease
Renal disease
Poor outcome

OBESITY AND COVID :

Obesity is defined as a body mass index > 25 kg/m2. Obesity is a state of chronic inflammation. Altered levels of inflammatory levels were noted in overweight and obese individuals. The initiating mechanism for the development of obesity is chronic caloric excess, over and beyond the organism's level of energy expenditure.

This leads to adipocyte hypertrophy and these distorted adipocytes are in constant mechanical and biochemical stress which leads to adipocyte apoptosis and inflammatory mediators such as TNF 1 alpha, IL 1β, and IL-6.

Popkin et al showed obese covid patients had a 113 % higher rate of hospitalization, 74% higher rate of ICU admission, 48 % higher rate of mortality. (27)


Immune Dysfunction
·Impaired function of T lymphocyte and subpopulations
Cardiometabolic disease
Hypertension
Diabetes
Hight LDL Cholesterol
Hight Triglycerides
Low HDL Cholesterol
Pulmonary Function
·↓ERV, FC, and RSC
·↓Diaphragmatic excursion and pulmonary function
·Impaired ventilation
·↓Oxygen-saturated blood levels
Heart Disease
·HFpEF
·Cardiomyopathy
·Increased risk for AF
SARS-CoV-2
reservoir
Kidney Disease
·Podocyte hypertrophy and dysfunction
·↓Podocyte density and number
·Glomerular hypertrophy and capillary hypertension
.Glomerulomegaly
·Glomerulosclerosis, proteinuria, and ESRD
·↓EGFR and ERPF; ↑FF
Endothelities
·Apoptosis-related endothelial dysfunction
·Imbalance in vasodilatory and vasoconstricting agents
·Prothrombotic and proatherogenic state
·Platelet hyperactivation, enhanced leukocyte adhesion
·Vasoconstriction, pro-oxidation,and vascular inflammation
·Impaired hemostasis, atherosclerosis, and thrombosis
Inflammation
·↑Leptin, TNF-α, and IL-6
Hypercoagulability
·Adipocytokines and coagulation factors hyperactivity
·↓Fibrinolysis
·↑Inflammation, oxidative stress, and endothelial dysfunction

HEMATOLOGICAL MANIFESTATIONS OF COVID-19 :

The lungs are the main target of covid-19. However, the infection has a significant impact on the hematopoietic system and hemostasis. This was initially described by Guan et al (1).

EFFECT ON NEUTROPHILS :

Neutrophilia is one of the commonly encountered lab parameters in covid-19. The median peak absolute count is above 11000 cells/cu.mm impacts the possibility of ICU admission. Neutrophil lymphocyte ratio (NLR) correlates well with pneumonia progression.

EFFECT ON LYMPHOCYTES :

Lymphocytopenia was observed in 83.2 % of covid patients around 7 -14 days after the incubation period. Lymphocyte repletion was also taken as a marker of recovery. The reason for lymphocytopenia is the expression of ACE2 receptors on lymphocytes which causes the virus to directly infect these cells and cause their lysis.

EFFECT ON PLATELETS :

A meta-analysis by Lippi showed thrombocytopenia is significantly associated with the severity of covid-19. (28) Thrombocytopenia is present in 36.2% of covid positive patients (1). Platelet to lymphocyte ratio may also give a reflection of the ensuing cytokine storm.

COAGULATION ABNORMALITIES IN COVID-19 :

In addition to thrombocytopenia as observed by Guan et al, the elevation of D dimer and fibrin degradation products are seen in 46.4 % of patients. (3) The prothrombin time (PT) and activated partial thromboplastin time (aPTT) showed only mild prolongation. Tang N described that nonsurvivors showed significantly raised D dimer and fibrin degradation products than survivors of covid (29).

VENOUS THROMBOEMBOLISM IN COVID-19 :

One study by Cui S reported that the incidence of venous thromboembolism is 25% in covid-19 patients(30). Critically ill patients who do not have any predisposing factors manifested with various thrombotic events such as microvascular thrombosis, deep vein thrombosis, pulmonary thromboembolism**,** and acute arterial thrombosis.

Thrombotic complications include stroke, acute limb ischemia, and acute coronary Syndromes.

PROPOSED MECHANISMS FOR VTE IN COVID-19 : (31)

1. immune dysregulation and endothelial dysfunction
2. prolonged immobilisation
3. dehydration
4. co-existing comorbidities
5. genetic predisposition such as factor v Leiden mutation.
6. hyperinflammatory state leading to increased blood viscosity.

CYTOKINE STORM AND COVID-19 :

Cytokine storm is a systemic inflammatory response to infections and drugs which leads to excessive activation of immune cells and generation of pro-inflammatory cytokines such as IL-1, IL-6, IFN, CXCL 10, etc. covid-19 infection produces immune dysregulation and lead to cytokine storm and cause increased morbidity and mortality.

Patients with cytokine storm have early acute respiratory distress syndrome and coagulation abnormalities. They have hyperferritinemia, high LDH, high IL-6, and elevated CRP. (32)

POSTCOVID-19 SYNDROME : (33)

Most viral diseases are self-limiting. Covid-19 disease not only produces significant morbidity and mortality during illness but also produces late complications. A unique feature of covid-19 is the persistence of symptoms even after months of illness. The patients who suffer from this type of persistent illness is termed as having the postcovid-19 syndrome. The exact pathophysiology for this cause is not known but effects of direct viral injury during illness and also systemic inflammatory response triggered by a virus is blamed.

FACTORS CONTRIBUTE TO POSTCOVID-19 SYNDROME :

- persistent viremia
- reinfection
- inflammatory reactions
- posttraumatic stress disorder

SYMPTOMATOLOGY OF POSTCOVID-19 SYNDROME :

- post-covid myalgias, arthralgias
- post-covid fatigue
- anosmia/ageusia
- chronic cough, pulmonary fibrosis
- bronchiectasis and reduction in pulmonary function
- GI upset, asymptomatic elevation of pancreatic enzymes, and transaminitis
- Thromboembolic conditions such as stroke and myocardial ischemia
- Guillain barre syndrome
- Seizures, encephalitis, delirium
- Metabolic disruption such as poor control of diabetes
- Psychological distress
- Secondary infections such as post-covid sepsis and post-covid mucormycosis.

Post covid fatigue is the most commonly encountered symptom in patients encountered from covid-19 irrespective of age. They have decreased capacity to perform even day-to-day activities.

Persistent cough or new onset of dry cough is the symptom next to fatigue. it was seen in patients of all severities. Some patients also complain of weight loss after discharge probably due to severe catabolic stress.

Thromboembolic complications such as stroke, myocardial ischemia and pulmonary thromboembolism were also observed in patients who are discharged after covid19 recovery. Even sudden cardiac death was also reported. This is attributed to myocardial infarction or arrhythmias due to the inflammatory process which leads to endothelial dysfunction and causes thrombotic complications.

Inflammatory mediators take several weeks to revert to normal. Psychological distress is not only due to illness itself but also due to isolation, loss of family members, loss of job, and post covid complications.

In one study done in the USA, the author reported 32.6% of patients to have cardiopulmonary symptoms such as cough or breathlessness, 18% of patients have a new-onset cough or worsening of pre-existing cough, 13% of patients had a persistent loss of taste and smell, and 58% patients having difficulty in doing even day to day activities. (34)

In another study which was done among 150 noncritical patients who were followed for 2 months, at D30, 68% of patients had at least one symptom; and at D60, 66% had anosmia/ageusia. Dyspnoea concerned 36.7% of patients at D30 and 30% at D60. Half of the patients at D30 and 40% at D60 reported asthenia. Persistent symptoms at D60 were significantly associated with age 40 to 60 years old, hospital admission and abnormal auscultation at symptom onset. (35)

The sequelae of covid19 were so alarming still we do not know what will be the future long-term complications and its burden on covid survivors and medical society.

LABORATORY FINDINGS :

The most common laboratory findings in covid-19 are severe lymphopenia, elevated aminotransferases, CPK, troponin T, and elevated inflammatory markers like CRP, serum LDH, ferritin, IL-6, and D -dimer. They are associated with a worse prognosis and mortality.

MOLECULAR TESTS (RT PCR) :

Specimen :

Samples were collected from the upper respiratory tract via nasopharyngeal swabs and oropharyngeal swabs and lower respiratory tract via expectorated sputum and bronchoalveolar lavage .collected samples are then stored in 4 C before sending to the laboratory for amplification. B wire et al reported that positive detection rate varies between various specimens. (36)

Bronchoalveolar lavage fluid	91.8%
sputum	68.1%
Nasopharyngeal swab	45.5%
Oropharyngeal swab	7.6%
Rectal swab	87.8%
Stool specimen	32.8%
Blood	1.0%
Urine	0.0%

SPECIMEN COLLECTION PROCEDURE : (37)

- All swab specimens should be collected with the help of Dacron and polyester flocked swabs.
- After collection swab specimens should be placed in a viral transport medium immediately.
- The container is sealed tightly and transported in an icebox or vaccine container with hard frozen gel packs.

NASOPHARYNGEAL SWAB COLLECTION :

- Insert a dry swab into the nostril and gently proceed to the back to the nasopharynx.
- Leave in place for a few seconds and slowly remove the swab while rotating it.
- Carefully put the swab in the viral transport medium and break the swab at the breakage point so the swab end is inside immersed in the viral transport medium.

OROPHARYNGEAL SWAB COLLECTION :

- Use a sterile tongue depressant to depress the tongue.
- Insert swab into the posterior pharynx and tonsillar areas.
- Rub swab over both tonsillar pillars and posterior pharynx.
- Avoid touching the tongue, teeth, and gums.

PROCESSING :

The process involves the synthesis of double-stranded DNA from viral RNA by either reverse transcription PCR or real-time RT PCR. The sensitivity of RT PCR is not very high which is around 60% but the specificity is very high. (38) False-negative rates may range from 5 to 40 %. Hence negative results must be correlated clinically. The test yield of RT PCR is maximum from day 1 -3 of symptom onset.

COVID RE-INFECTION :

A person can be labeled covid positive until 90 days of RT PCR positivity but after 90 days if the RT PCR becomes positive, he should be considered as re-infection.(39).

SEROLOGICAL TESTS :

The reliability of serological tests depends on the duration of the illness. IgM becomes positive after 5 days of symptom onset and IgG after 14 days of symptom onset. These serological tests are very useful in the setting when a patient is tested negative for covid RT PCR but clinical suspicion is very high.

IMAGING :

CHEST X-RAY :

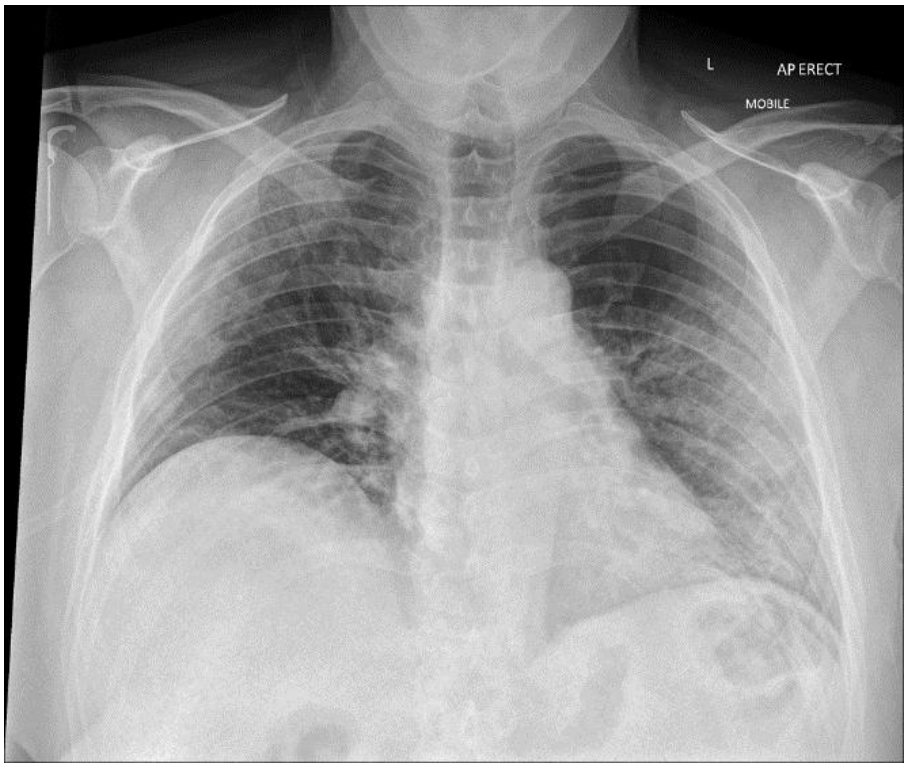
Due to widespread pandemic, a lot of diagnostic methods were tried to adopt to diagnose early which helps not only in isolating and preventing further spread of the disease but also in providing appropriate care to the patients infected with covid-19.

Apart from molecular and serological tests imaging played an important role in diagnosis. As it is not possible for every covid-19 patient to undergo CT imaging because of overburdened health care infrastructure, chest x-ray played a crucial role in picking up covid affected patients.

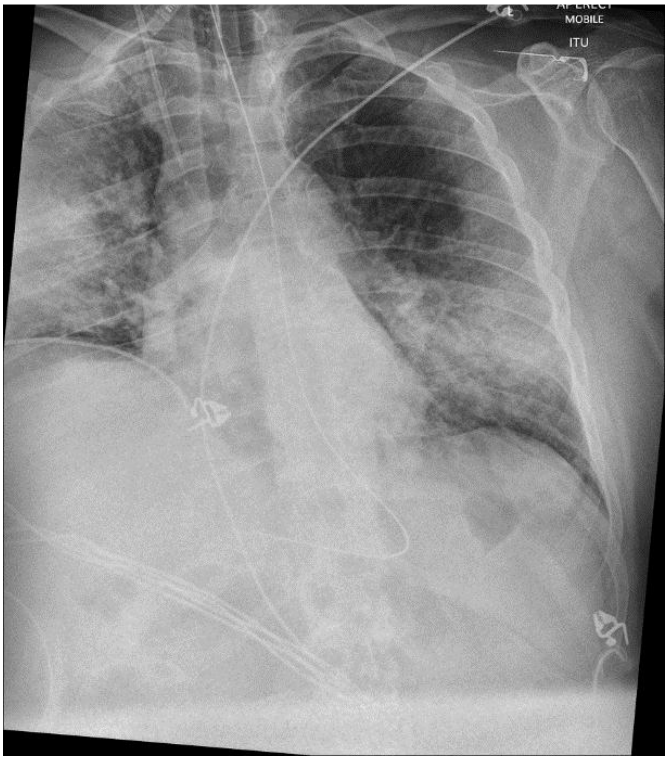
The time between initial symptoms and chest x-ray is a significant factor that affects the reliability of findings. During the first 3 days of symptom onset, a chest x-ray showed no reliable findings. Chest x-ray showed reliable findings only after 10-12 days of symptom onset. (40)

Ho yeun et al studied 64 patients with covid-19. Of these, 58 patients had positive initial RT-PCR (91%), abnormal baseline CXR (69%), and positive initial RT-PCR with abnormal baseline CXR (59) respectively. Six patients (9%) showed CXR abnormalities before eventually testing positive on RT-PCR. Consolidation was the most common finding (47%), followed by GGO (33%). CXR abnormalities had a peripheral (41%) and lower zone distribution (50%) with bilateral involvement (50%). Pleural effusion was uncommon (3%). (41)

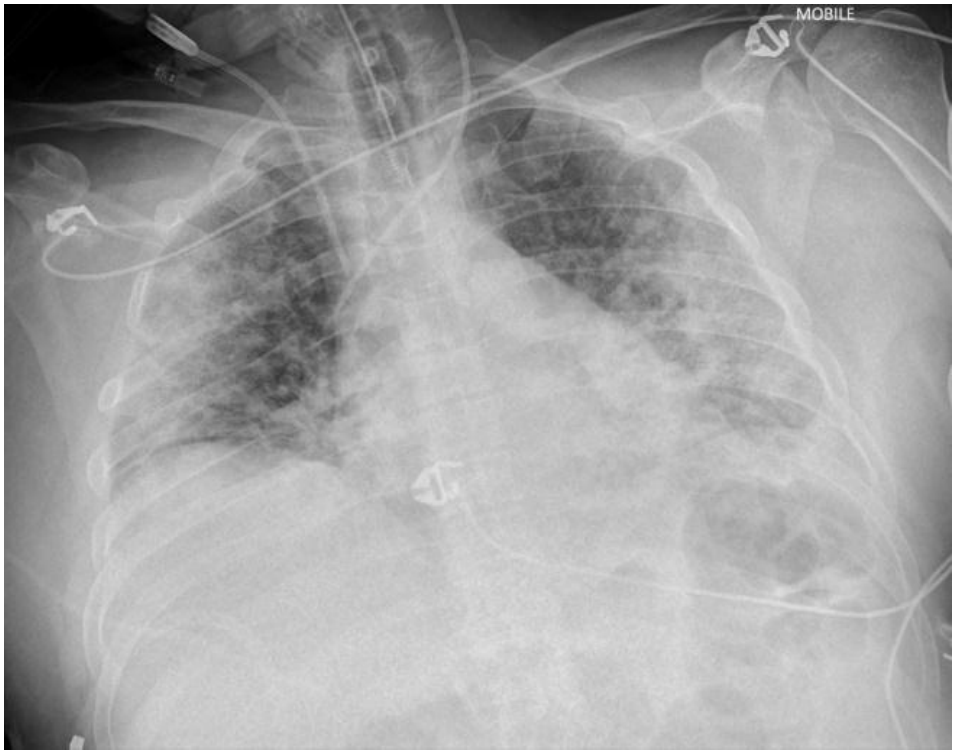
The following images are serial images of a patient with covid-19.(42)



a. bilateral mid-zone airspace opacification in a Minor peripheral distribution



b. Bilateral peripheral airspace opacification which has progressed since the prior radiograph



c. Further progression in the bilateral airspace opacification with a more peripheral distribution than on the prior radiograph

CT CHEST :

Still, the covid RT PCR is considered the gold standard in diagnosing patients with covid-19, many studies suggested CT chest as the initial diagnosing tool. It is particularly useful in the situation where the covid RT PCR is negative still there is a strong suspicion of covid.

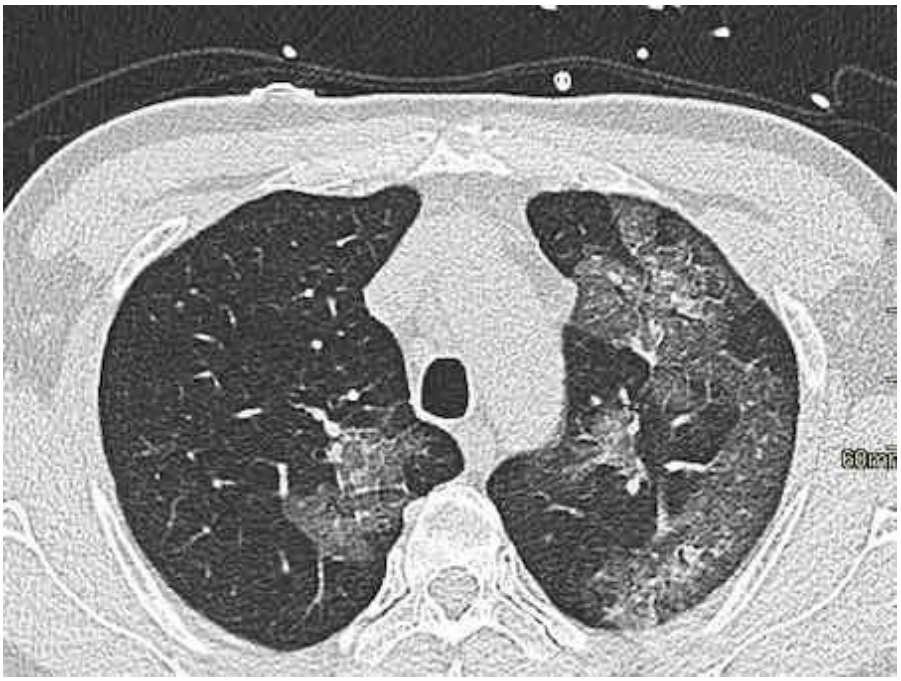
Recently serological tests are very useful in the above-said condition, still, they are limited by detecting ongoing active infection and also by relatively low negative predictive value and high false negatives.

KEY FINDINGS OF COVID-19 IN CT IMAGING :

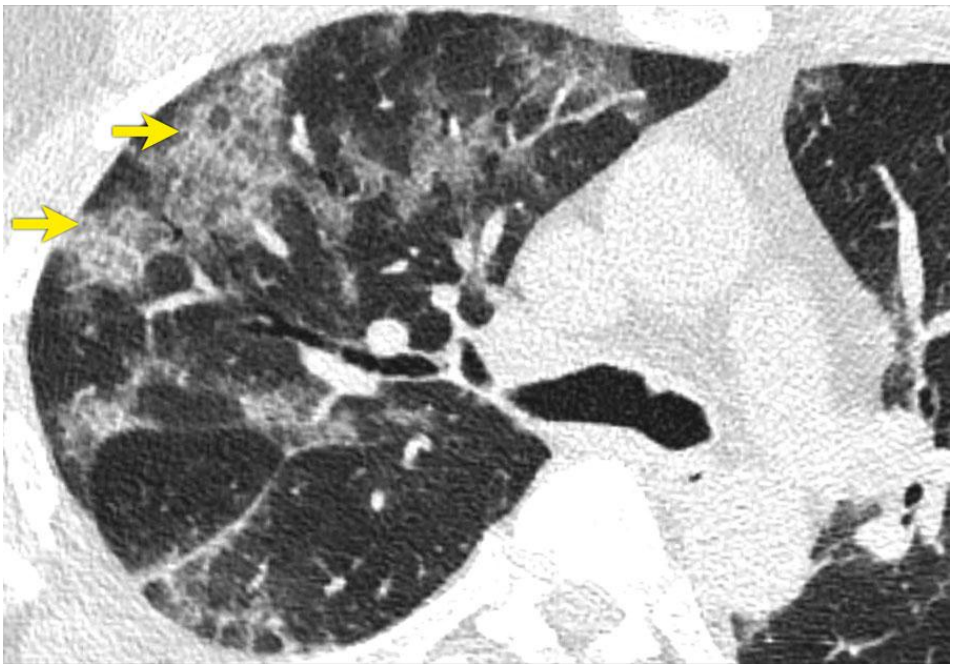
Distribution	Bilateral, multilobar, subpleural, peripheral, and basilar predominant
Pattern	Rounded morphology, ground-glass opacities (GGO), and multilobar consolidations
Uncommon findings	Mediastinal lymphadenopathy, pleural effusions, cavitations, and pulmonary nodules
Progression	Lobar consolidations, pleural effusions, subpleural blebs, and bullae may develop in severe illness
Organization	Early fibrosis and traction bronchiectasis may develop in severe ARDS in two to four weeks

Fang et al., in their study on 51 patients demonstrated that the difference in detection rate for initial CT chest was 98% compared to 71% for RT-PCR test. 72% of admitted patients had typical findings of peripheral, subpleural ground-glass opacities (GGO), often in the lower lobes, 28% of patients had atypical CT manifestations(43). Pulmonary vascular prominence in the areas of ground-glass opacities has been found in 45% to 90% of cases.

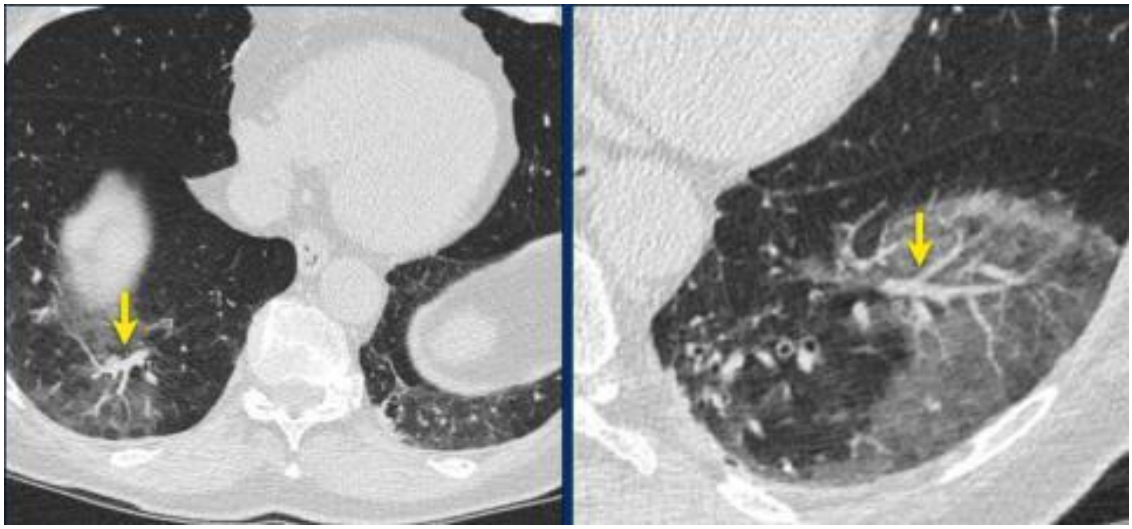
CT IMAGES OF COVID-19 PATIENTS : (44)



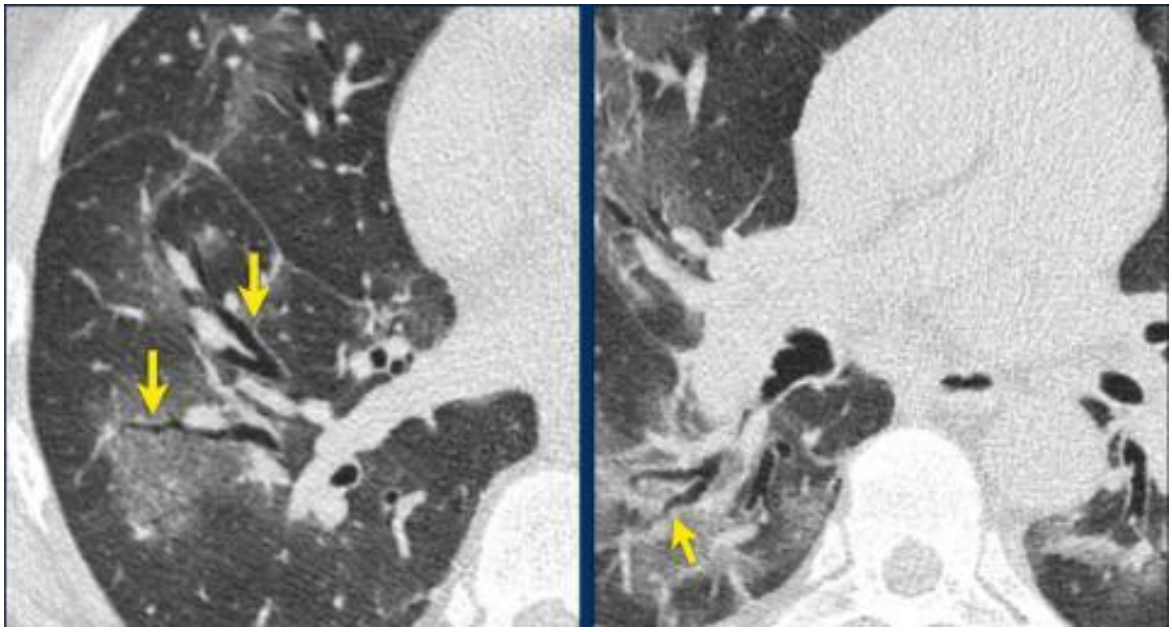
Ground glass opacities which are usually bilateral, multifocal, and peripheral



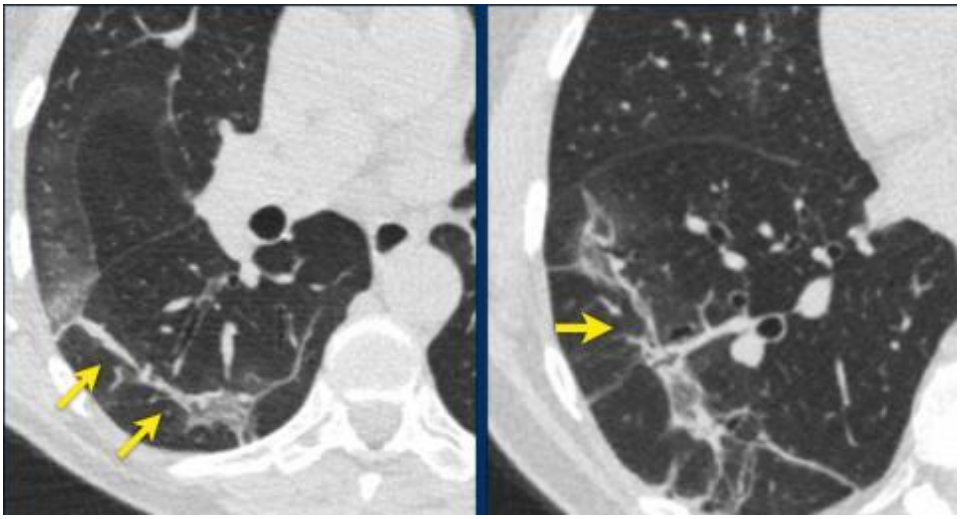
Crazy paving pattern



Vascular dilatation in the area of ground-glass opacities



Traction bronchiectasis in the areas of ground-glass opacities



Subpleural bands and architectural distortion

Covid-19 imaging patterns on CT chest : (45)

COVID-19 Pneumonia Imaging Classification	Rationale	CT Findings
Typical appearance	Commonly reported imaging features of greater specificity for COVID-19 pneumonia	Peripheral, bilateral, GGO with or without consolidation or visible intralobular lines ("crazy-paving") Multifocal GGO of rounded morphology with or without consolidation or visible intralobular lines ("crazy-paving") Reverse halo sign or other findings of organizing pneumonia (seen later in the disease)
Indeterminate appearance	Nonspecific imaging features of COVID-19 pneumonia	Absence of typical features AND presence of: Multifocal, diffuse, perihilar, or unilateral GGO with or without consolidation lacking a specific distribution and are nonrounded or nonperipheral Few, very small GGOs with a nonrounded and nonperipheral distribution
Atypical appearance	Uncommonly *or* not reported features of COVID-19 pneumonia	Absence of typical or indeterminate features AND presence of: Isolated lobar or segmental consolidation without GGOs Discrete small nodules (centrilobular, "tree-in-bud") Lung cavitation Smooth interlobular septal thickening with pleural effusion
Negative for pneumonia	No features of pneumonia	No CT features to suggest pneumonia

CT CHANGES OVER TIME : (44)

Early-stage	0 – 4 days	GGOs, partial crazy paving, lower number of involved lobes
Progressive stage	5 – 8 days	Extension of GGOs, increased crazy paving pattern
Peak stage	10 – 13 days	consolidation
Absorption stage	≥ 14 days	Gradual resolution

CO-RADS GRADING : (46)

CO-RADS grading is based on level of suspicion for covid-19 infection

CO-RADS 1	No	Normal or noninfectious etiology
CO-RADS 2	low	Abnormalities consistent with infections other than covid-19
CO-RADS 3	indeterminate	Unclear whether covid-19 is present
CO-RADS 4	high	Highly suspicious of covid
CO-RADS 5	Very high	Typical covid-19
CO-RADS 6	RT PCR positive	

CT SEVERITY SCORE : (44)

Calculated by scoring the percentages of each of the five lobes that is involved.

1. < 5% involvement
2. 5% to 25% involvement
3. 26% to 49% involvement
4. 50% to 75% involvement
5. > 75% involvement

The total score is the sum of the individual lobar scores and ranges from 0 to 25.

CLINICAL SCORES FOR COVID-19 :

Patients admitted with covid-19 had rapidly progressive hypoxemia due to an inflammatory cascade that occurs in the pulmonary alveolar epithelium which leads to acute respiratory distress syndrome. Several scores such as Pneumonia Severity Index (PSI), CURB-65, CRB 65, A- DROP, SMART-COP have been developed to detect patients at high risk.

In addition to that National Early Warning Score 2 (NEWS2) along with quick sequential organ failure assessment score (qSOFA) were proposed for prognostic prediction of severe covid-19. To predict early hospital

respiratory failure, Haimovich et al developed a simple bedside scoring system named as quick covid-19 severity index (qCSI). (5)

QUICK COVID-19 SEVERITY INDEX :

The previous two waves of covid showed that appropriate resource allocation is essential as hospital systems are not designed for handling this type of epidemic (6). Particularly in the second wave of covid which showed a sudden outburst of covid cases which stretched the health systems stretched beyond their capacities. In that situations, rational decisions will produce a huge impact on patients admitted with covid-19.

Haimovich et al noted a significant rate of patients admitted to the emergency department with covid-19 deteriorated within 24 hrs of admission. This observation made them design a simple bedside scoring system which helped them to predict patients who were going for early clinical decompensation and also helped them to triage and put them in early ICU care which significantly alters the prognosis of the patient. Another study by Rodriguez et al also reported that qCSI score showed a good performance in predicting ICU admissions.

Critical respiratory illness at 24 hr is defined by oxygen requirement ≥ 10 L/min, high flow nasal oxygen, noninvasive ventilation, invasive ventilation, or death.

VARIABLES IN qCSI SCORE :

- Respiratory rate at the time of admission ,breaths/min
- Pulse oximetry (lowest value recorded during first four hours of patient encounter)
- O2 flow rate, L/min.

VARIABLES		**POINTS**
Respiratory rate, breaths/min	≤ 22	0
	23 - 28	1
	> 28	2
Pulse oximetry	> 92 %	0
	89 – 92%	2
	≤ 88%	5
O2 flow rate, L/min	≤ 2	0
	3 – 4	4
	5 - 6	5

INTERPRETATION :

qcsi score	**Risk level**	**Risk of critical illness at 24 hrs**
≤ 3	Low	4%
4 – 6	Low-intermediate	30%
7 – 9	High-intermediate	44%
10 – 12	High	57%

Management of covid-19 :

The treatment is mainly symptomatic and supportive in most cases. Vaccination being available in hand plays a major role in controlling the pandemic even though there are variations in the virus which made it difficult.

TREATMENT OPTIONS FOR MILD CASES : (18)

- Patients who are covid swab positive and having upper respiratory tract symptoms without any shortness of breath or hypoxia falls into this category.
- They are a suitable group for people for home isolation and care.
- They have been educated about physical distancing, indoor mask use, and strict hand hygiene.
- Symptomatic management can be advised such as hydration, antipyretics, antitussives, and multivitamins.
- They should be educated regarding monitoring of temperature and oxygen saturation by applying a spo2 probe to fingers.
- They should be advised to keep in touch with a nearby health care provider.

THERAPIES BASED ON LOW CERTAINTY OF EVIDENCE :

- Tab ivermectin 200 mcg/kg once a day for 3 days. (it should be avoided in pregnant and lactating women).
- Tab Hydroxychloroquine 400 mg BD for 1 day f/b 400 mg OD for 4 days unless contraindicated.
- Inhalational budesonide is given via metered-dose inhaler/dry powder inhaler at a dose of 800 mcg BD for 5 days if symptoms such as fever or cough are persistent beyond 5 days of disease onset.

TREATMENT FOR MODERATE DISEASE : (18)

Patients with any one of the following fall into this category. 1. respiratory rate ≥24 /min

2.spo2 90 - ≤93% on room air.

Oxygen support :

- Target spo2 should be maintained at 92 – 96% (88-92% in patients with COPD).
- Preferred devices for oxygenation: non-rebreathing face mask
- Awake prone position should be encouraged in all patients requiring supplemental oxygen therapy (sequential position changes every 2 hours).

ANTI-INFLAMMATORY OR IMMUNOMODULATORY THERAPY:

- Inj methylprednisolone 0.5 to 1.0mg /kg in 2 divided should be given for a duration of 5 days or inj dexamethasone 8 mg iv od should be given.
- Once the patient becomes stables iv drugs can be changed to oral drugs.

ANTICOAGULATION :

- Conventional unfractionated heparin 5000 IU BD or low molecular weight heparin 0.5mg/kg per day SC should be given if there is no contraindication or high risk of bleeding.

MONITORING :

- Blood pressure, respiratory rate, pulse rate, and spo2 should be monitored regularly.
- Serial chest x-ray or CT chest should be done if there is a worsening of oxygen saturation.
- Lab parameters such as CRP and D dimer should be repeated 48 to 72 hrly ; and CBC, RFT, and LFT should be monitored every 24 to 48 hrs

TREATMENT OF SEVERE DISEASE : (18)

Severe covid pneumonia is defined as patients with any one of the following criteria.

1.respiratory rate >30/min

2.spo2< 90% on room air.

Patients with severe disease should be admitted to the intensive care unit.

RESPIRATORY SUPPORT:

- High flow nasal oxygen should be used if the patient has increased oxygen requirement.
- If the patient not tolerating HFNO, non-invasive ventilation should be tried.
- Still, there is increased oxygen requirement and increased work of breathing, the patient should be intubated and connected to mechanical ventilation with ARDS protocol (low tidal volume and high PEEP).

ANTI-INFLAMMATORY OR IMMUNOMODULATORY THERAPY:

- Inj methylprednisolone 1 to 2mg/kg IV in 2 divided doses should be given for 5 days or an equivalent dose of dexamethasone can be given.

ANTICOAGULATION :

- Conventional unfractionated heparin 5000 IU BD or low molecular weight heparin 0.5mg/kg per day SC should be given if there is no contraindication or high risk of bleeding.

SUPPORTIVE MEASURES :

- Adequate hydration should be maintained.
- If coexisting sepsis or septic shock is present,it should be treated with sepsis protocol and local antibiogram.

MONITORING :

- Serial chest x-ray or CT chest should be done if there is a worsening of oxygen saturation.
- Lab parameters such as CRP and D dimer should be repeated 24 to 48 hours; and CBC, RFT, and LFT should be monitored daily.

DRUGS THAT CAN BE BASED ON LIMITED EVIDENCE AND ONLY IN SPECIAL SITUATIONS :

REMDESIVIR :

- Should be considered in moderate to severe disease.
- There shouldn't be any renal or hepatic dysfunction (eGFR <30,ml/min/m2 ; AST/ALT > 5 times upper limit of normal)(relative contraindication).
- For those patients who are within 10 days of symptom onset.
- Recommended dose: 200 mg IV on day 1 followed by 100 mg OD for the next 4 days.

TOCILIZUMAB :

Tocilizumab may be considered when all of the below criteria are met.

- The patient should have severe disease.
- There should be significantly raised inflammatory markers such as CRP and IL-6.
- Patient not responding despite use of steroids. And there shouldn't be any active bacterial or fungal infection.
- Recommended single dose: 4 to 6 mg/kg in 100 ml NS over 1 hour.

DISCHARGE CRITERIA : (47)

MILD CASES :

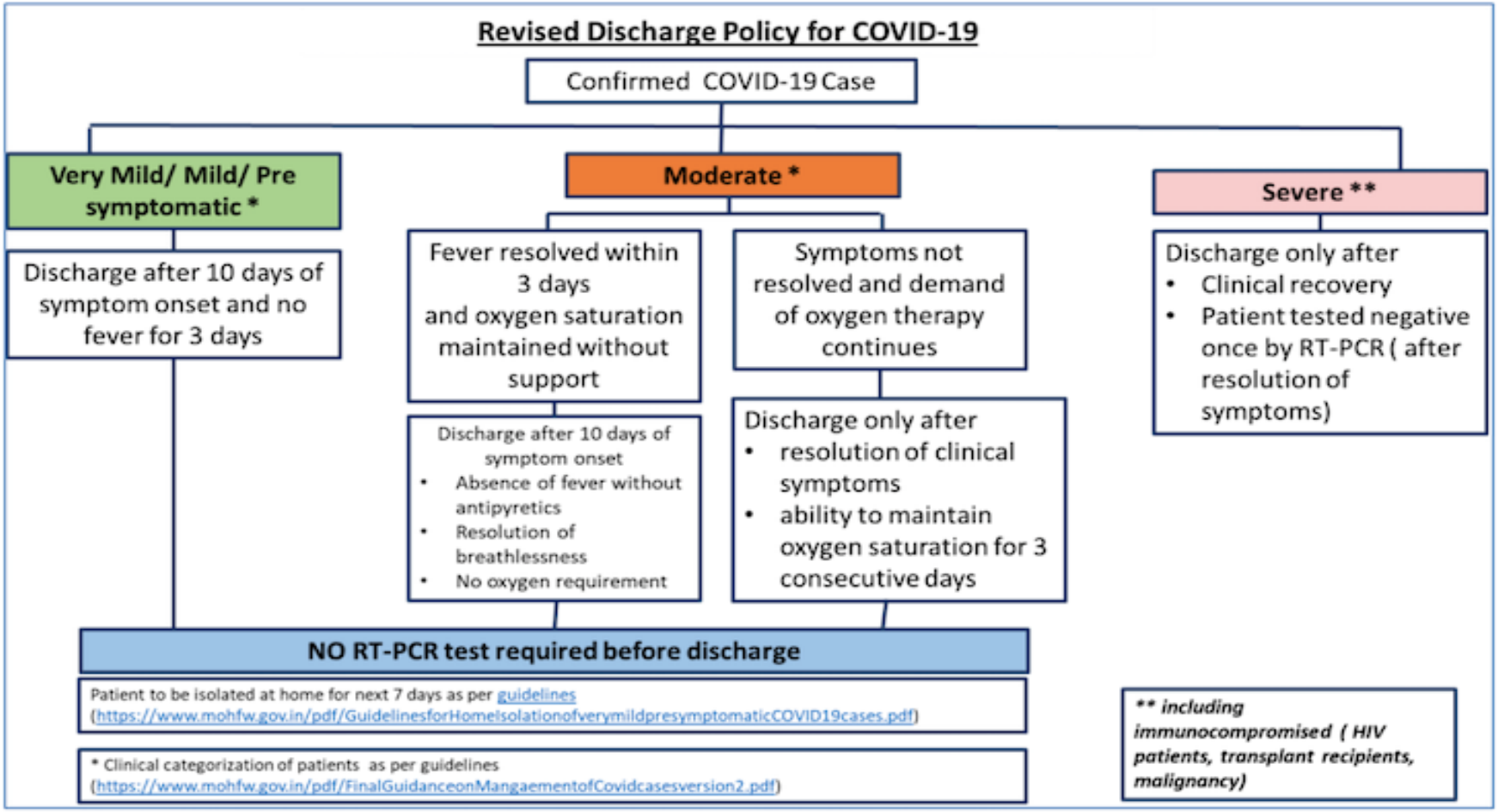
- Mostly mild cases will be admitted in the covid care center and regular monitoring of temperature snd spo2 will be done.
- The patient can be discharged if the following conditions are met .
    - 1.No fever for 3 days and
    - After 10 days of symptom onset.
- No need for testing before discharge.
- The patient will be advised to isolate himself at home and monitor their health for the next 7 days.
- if any deterioration occurs, the patient has to be referred to a higher centre.

MODERATE CASES :

- Moderate cases will be discharged only after 10 days of symptom onset and the following criteria.
- There should not be any fever without antipyretics.
- There should not be any breathlessness and o2 requirement.
- Here also no need for a repeat swab before discharge.
- At the time of discharge, the patient will be advised isolation at home and monitor their health for 7 days

SEVERE CASES :

- Discharge criteria based on Clinical recovery and negative RT-PCR (after resolution of symptoms)


Revised Discharge Policy for COVID-19
Confirmed COVID-19 Case
Very Mild/ Mild/ Pre symptomatic *
Moderate *
Severe **
Discharge after 10 days of symptom onset and no fever for 3 days
Fever resolved within 3 days and oxygen saturation maintained without support
Symptoms not resolved and demand of oxygen therapy continues
Discharge only after
Clinical recovery
Patient tested negative once by RT-PCR (after resolution of symptoms)
Discharge after 10 days of symptom onset
Absence of fever without antipyretics
Resolution of breathlessness
No oxygen requirement
Discharge only after
resolution of clinical symptoms
ability to maintain oxygen saturation for 3 consecutive days
NO RT-PCR test required before discharge
Patient to be isolated at home for next 7 days as per guidelines (https://www.mohfw.gov.in/pdf/GuidelinesforHomeIsolationofverymildpresymptomaticCOVID19cases.pdf)
* Clinical categorization of patients as per guidelines (https://www.mohfw.gov.in/pdf/FinalGuidanceonMangaementofCovidcasesversion2.pdf)
** including immunocompromised (HIV patients, transplant recipients, malignancy)

PREVENTION OF COVID-19 : (48)

Prevention is always better than cure. The best way to prevent covid infection is to avoid exposure to the virus. The mode of transmission of the virus is droplet and contact transmission. Following are the measures which help to prevent infection.

PHYSICAL DISTANCING :

- Try to stay away from crowded areas.
- Ensure a physical distancing of at least 6 feet.

USE OF MASK :

- Wash your hands properly before putting on the mask.
- Make sure the mask covers the mouth and nose and tie it as such there is no gap between the face and the mask.
- Avoid touching the mask while wearing it.
- Do not touch the front of the mask while removing and also replace the mask when it becomes damp.
- Don't re-use single-use masks and discard them after each use.

HAND HYGIENE :

- WHO suggests frequent hand washing with soap for at least 40 – 60 seconds using the appropriate technique and drying with a single use towel.
- Rub hands for at least 20- 30 seconds using an alcohol-based hand rub product.

RESPIRATORY HYGIENE :

- Cover the nose and the mouth with a tissue or using inside of your elbow when sneezing or coughing.
- Perform hand hygiene afterward and also stay away from ill people.

PROMPT SELF ISOLATION AND TESTING :

If symptoms of the covid present, one should seek medical advice and get isolated at home. In the meantime, he/she should get tested with covid RT PCR.

VACCINATION :

As there is no effective drugs against covid-19, vaccination is the only way to control this pandemic and reduce mortality and morbidity. WHO gave validation for vaccines on an emergency basis. The first mass vaccination program started in December 2020. As of December 2021, in India, 60% population had at least 1 dose of vaccination and 40 % had fully vaccinated. (49)

VACCINES PREDOMINANTLY GIVEN IN INDIA :

INDICATOR	**COVISHIELD**	**COVAXIN**
Type of vaccine	Recombinant covid19 vaccine based on viral vector technology	The whole virion inactivated coronavirus vaccine
Route	Intramuscular	Intramuscular
Dose	0.5 ml each dose	0.5 ml each dose
Course	2 doses	2 doses
schedule	3 months apart	28 days apart
Vaccination during pregnancy	recommended	Recommended
Vaccination to lactating mothers	recommended	Recommended
Adverse event following immunization (AEFI)	Injection site pain and tenderness, fatigue, myalgia, fever, chills, very rare events of demyelination	Injection site pain and tenderness, fatigue, myalgia, fever, chills,

CONTRAINDICATION OF VACCINES :

- Anaphylactic or allergic reaction to a previous dose of the covid19 vaccine.
- Any anaphylactic reaction to vaccines or injectable drugs or food items
- Persons having active symptoms of covid.
- Acutely unwell and hospitalized patient.

MATERIALS AND METHODS

This prospective observational study was conducted in Rajiv Gandhi Government General Hospital over a period of 6 months from May 2021 to October 2021. Approval was obtained from the Institute Ethics committee, Madras Medical College.

The study population consisted of 200 covid-19 positive patients who got admitted in Rajiv Gandhi Government General Hospital covid wards during the study period. These patients were included in the study after getting informed consent either from the patient or from the legal guardian.

Study Design

- Prospective observational study.

Inclusion Criteria

All hospitalized patients of both gender who meets the criteria

- Age above 18 yrs
- Covid-19 RT PCR confirmed cases
- Patients requiring oxygen 6L or less than 6L at the time of admission

Exclusion criteria :

- age <18 yrs

- patients requiring oxygen more than 6L, high flow oxygen, noninvasive or invasive ventilation at the time of admission.

- Not willing to participate in the study

In this study, during admission of covid RT PCR positive patients, respiratory rate, pulse oximetry saturation, and oxygen flow rate in L/min via face mask were entered and quick covid-19 severity index score was calculated using these variables. The patients were then classified into four risk strata based on the following scores :0 to 3 low risk,4 to 6 low to intermediate risk,7 to 9 high intermediate risk and 10 or more than 10 high risk. Then patients were monitored for the next 24 hrs to see early clinical decompensation that is oxygen requirement increased to 10 L or more ,high flow oxygen, non invasive or invasive ventilation or death.

In addition to that basic information such as complete blood count, serum biochemical test such LFT, RFT, inflammatory markers, and CT chest grading were collected from electronic records. The collected data were entered in a Microsoft Excel spreadsheet and analyzed statistically using EpiInfo software.

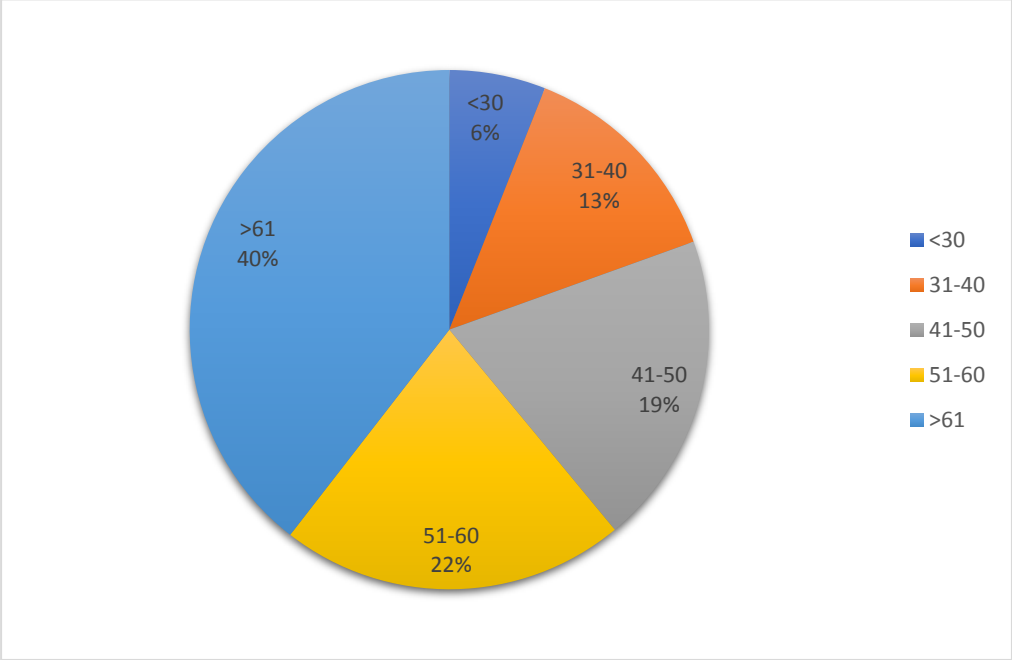
Statistical analysis was carried out to establish the performance of the quick Covid Severity Index in predicting the early clinical decompensation (within 24 hours). The analysis was also done to find out to see if there is any correlation between qCSI score and CT grading.

RESULTS

AGE DISTRIBUTION

AGE GROUP	Frequency	Percent
<30	12	6.0
31-40	27	13.5
41-50	39	19.5
51-60	43	21.5
>61	79	39.5
Total	200	100.0

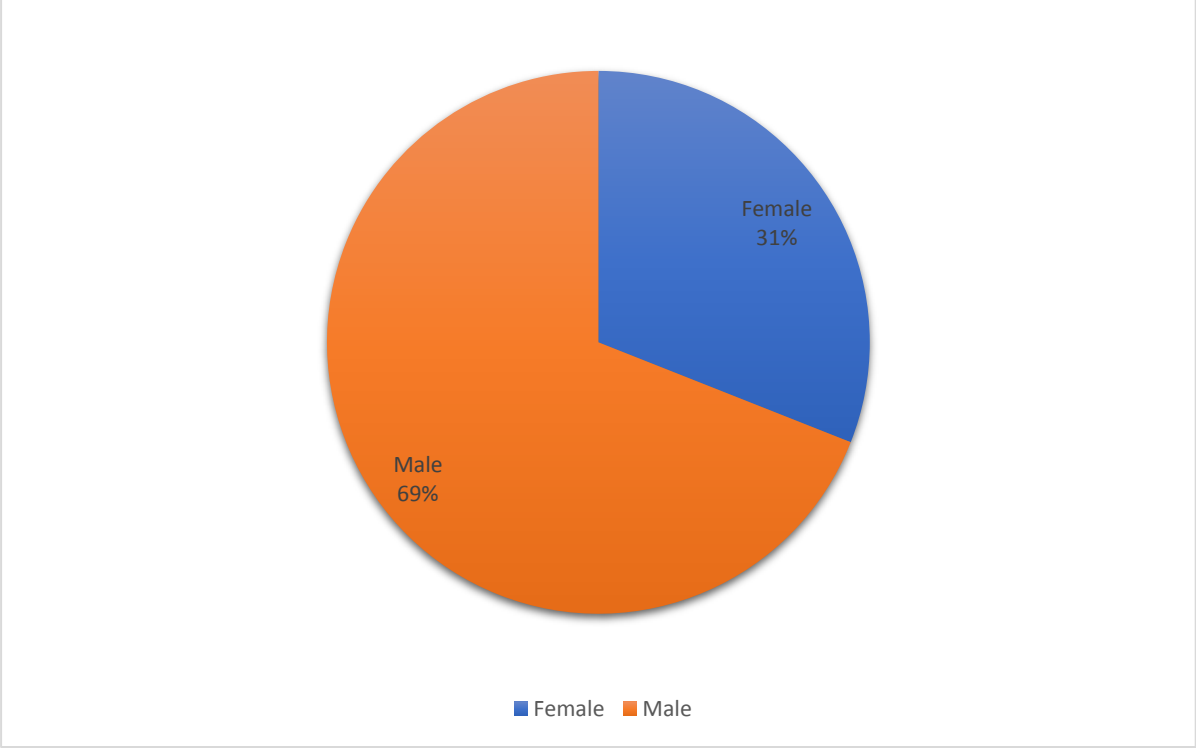
CHART NO. 1



SEXWISE DISTRIBUTION

SEX	Frequency	Percent
Female	62	31.0
Male	138	69.0
Total	200	100.0

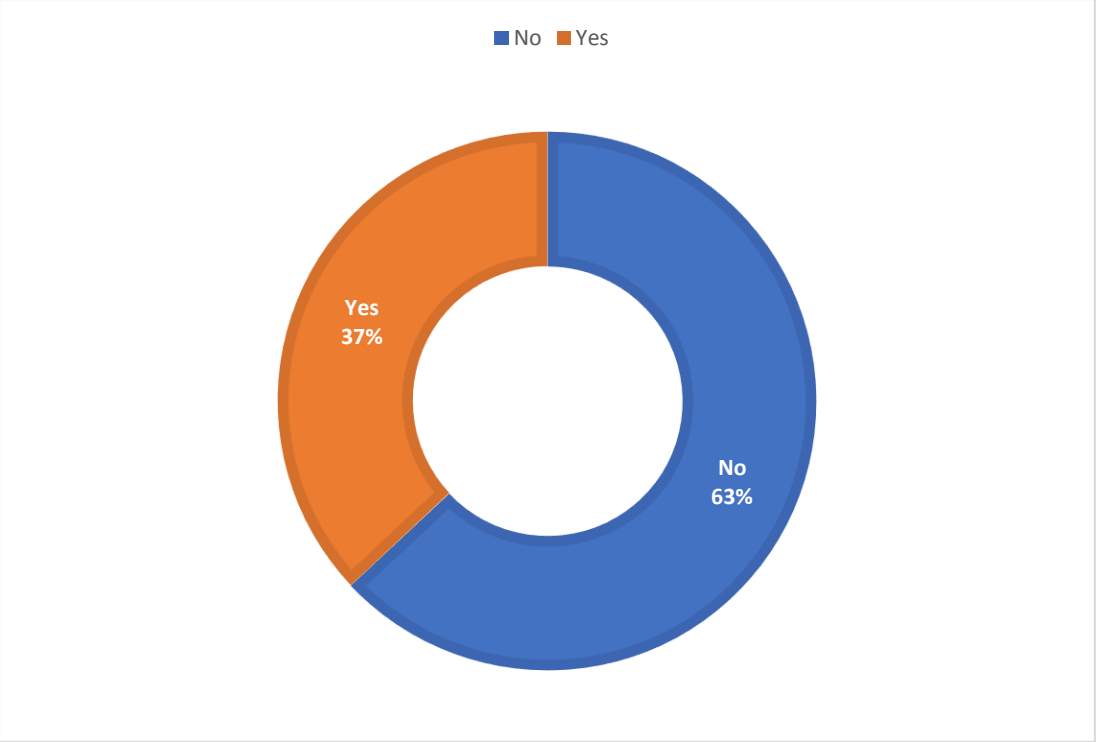
CHART NO. 2



PREVALENCE OF TYPE 2 DIABETES MELLITUS

T2DM	Frequency	Percent
No	126	63.0
Yes	74	37.0
Total	200	100.0

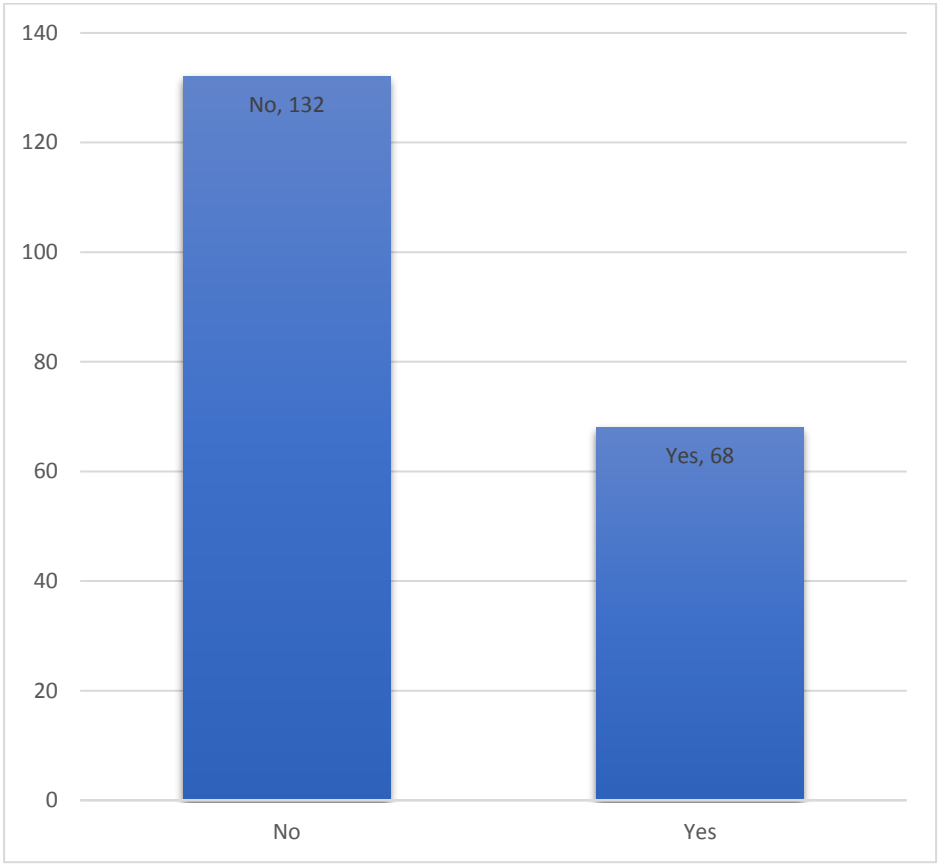
CHART NO.3



PREVALENCE OF SYSTEMIC HYPERTENSION

SHT	Frequency	Percent
No	132	66.0
Yes	68	34.0
Total	200	100.0

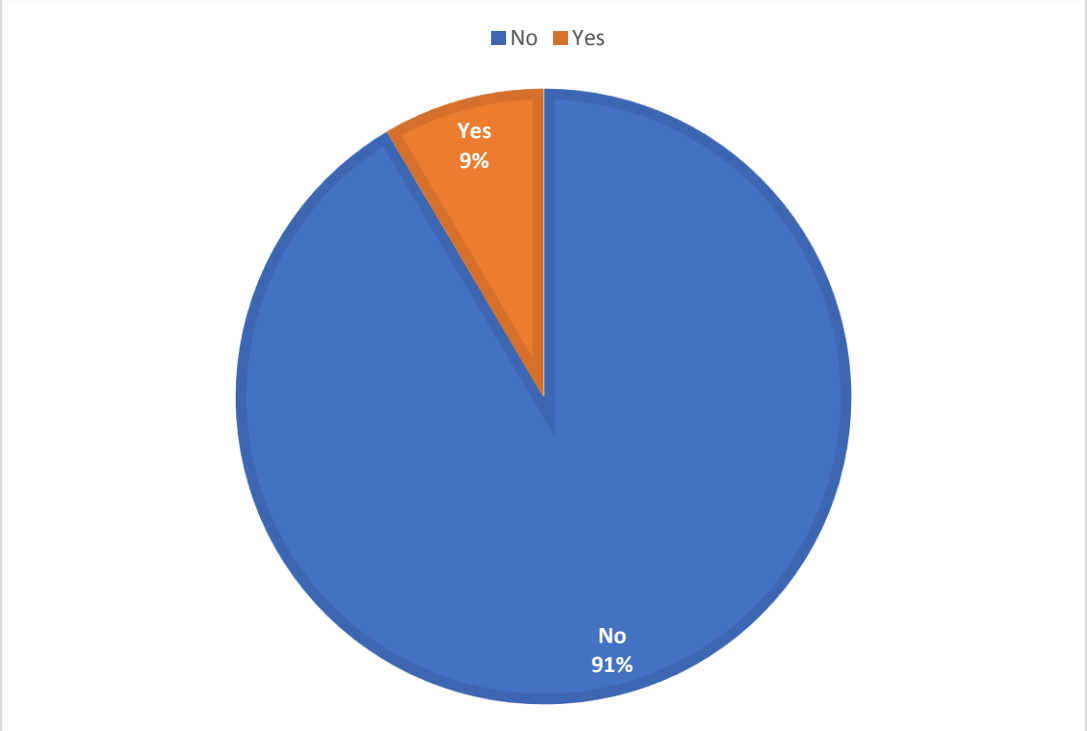
CHART NO.4



PREVALENCE OF CORONARY ARTERY DISEASE

CAD	Frequency	Percent
No	183	91.5
Yes	17	8.5
Total	200	100.0

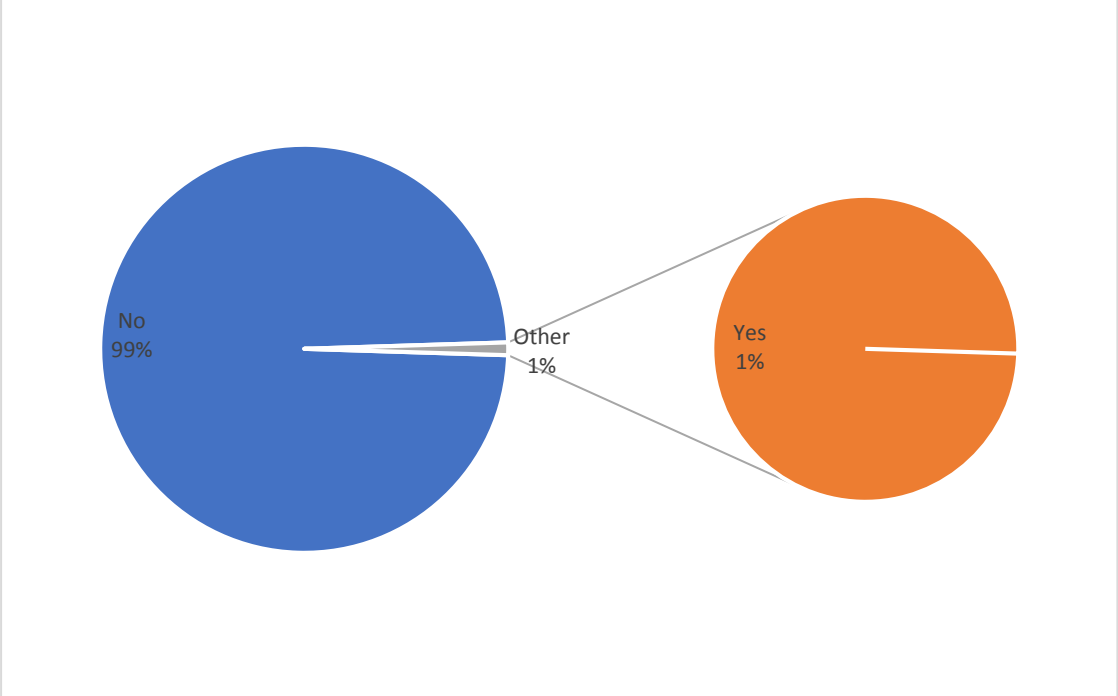
CHART NO. 5



PREVALENCE OF CHRONIC KIDNEY DISEASE

CKD	Frequency	Percent
No	198	99.0
Yes	2	1.0
Total	200	100.0

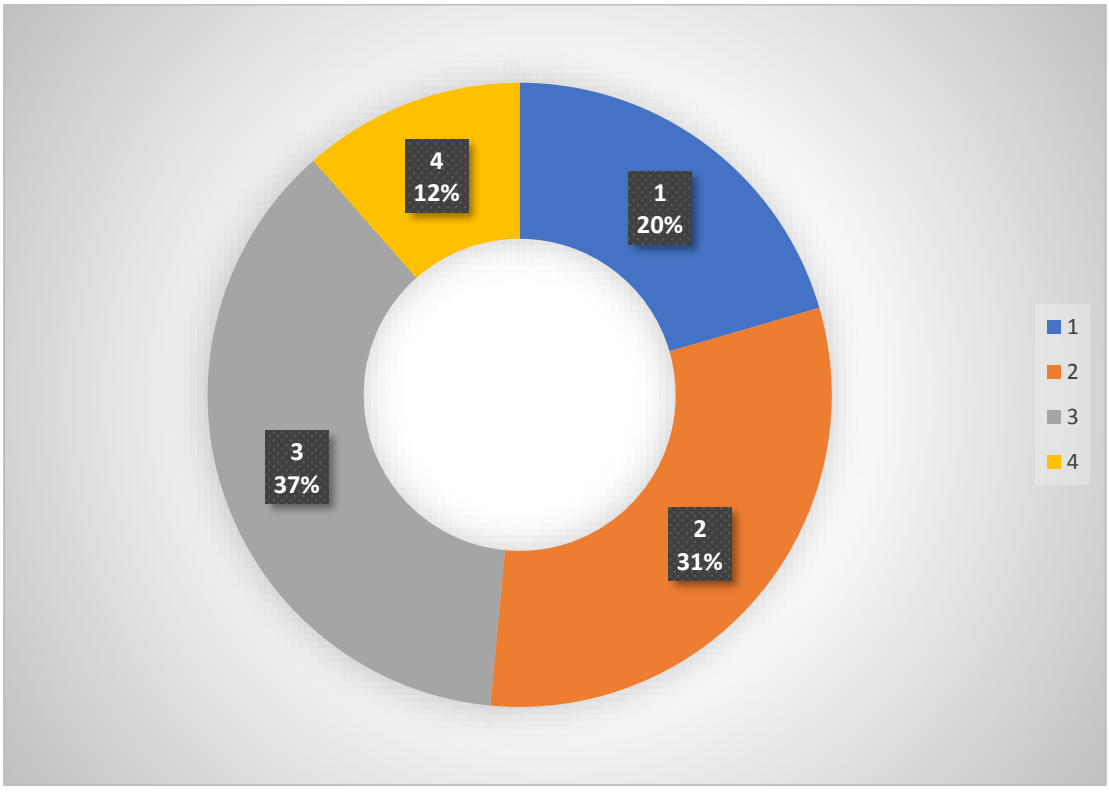
CHART NO. 6



DISTRIBUTION OF CT CHEST GRADING

CT CHEST GRADING (GRADE)	Frequency	Percent
1	41	20.5
2	62	31.0
3	74	37.0
4	23	11.5
Total	200	100.0

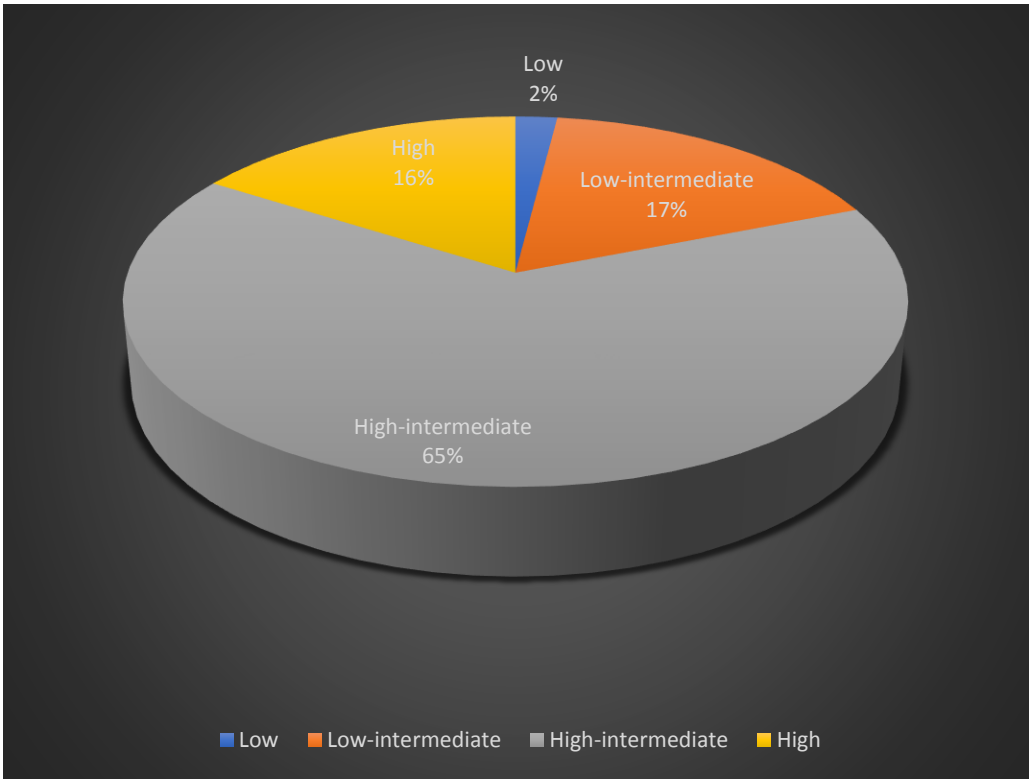
CHART NO. 7



DISTRIBUTION OF qCSI SCORE

QCSI SCORE (POINTS)	Frequency	Percent
Low	4	2.0
Low-intermediate	34	17.0
High-intermediate	130	65.0
High	32	16.0
Total	200	100.0

CHART NO.8

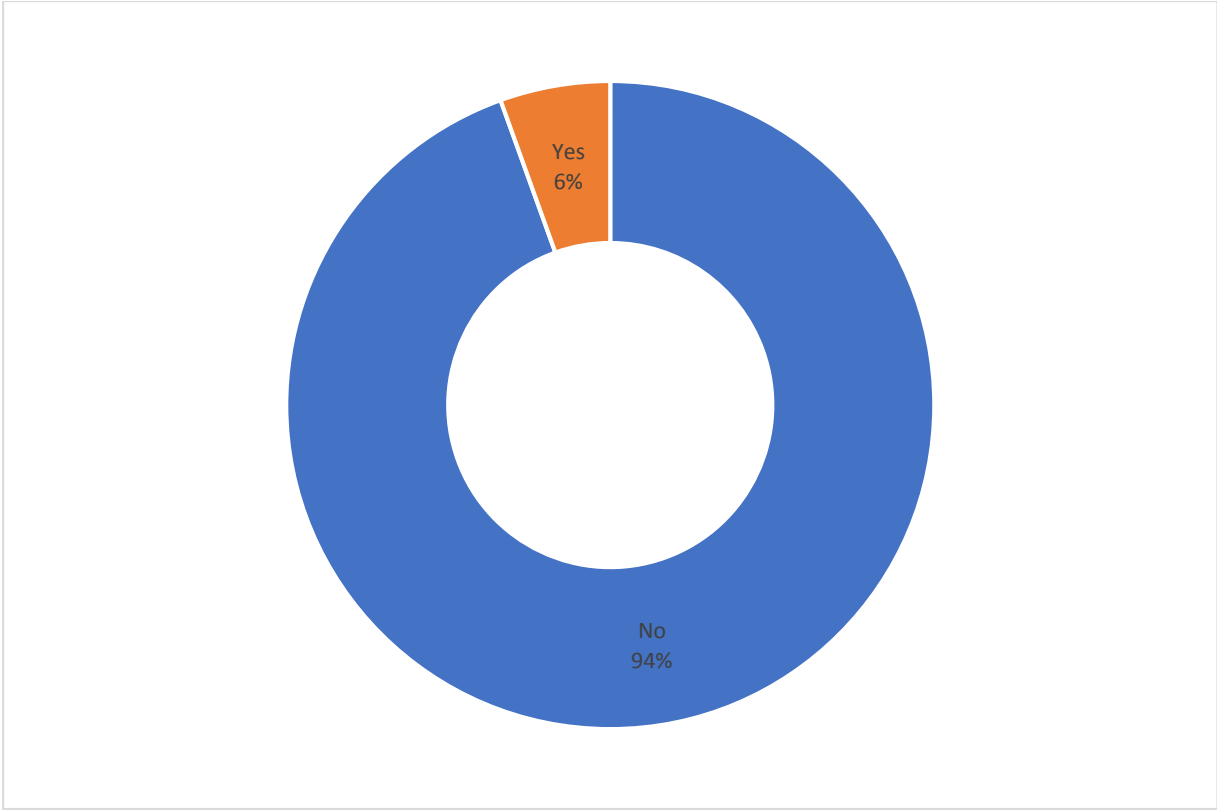


DISTRIBUTION OF SYMPTOMS

FREQUENCY OF HEADACHE

HEADACHE	Frequency	Percent
No	189	94.5
Yes	11	5.5
Total	200	100.0

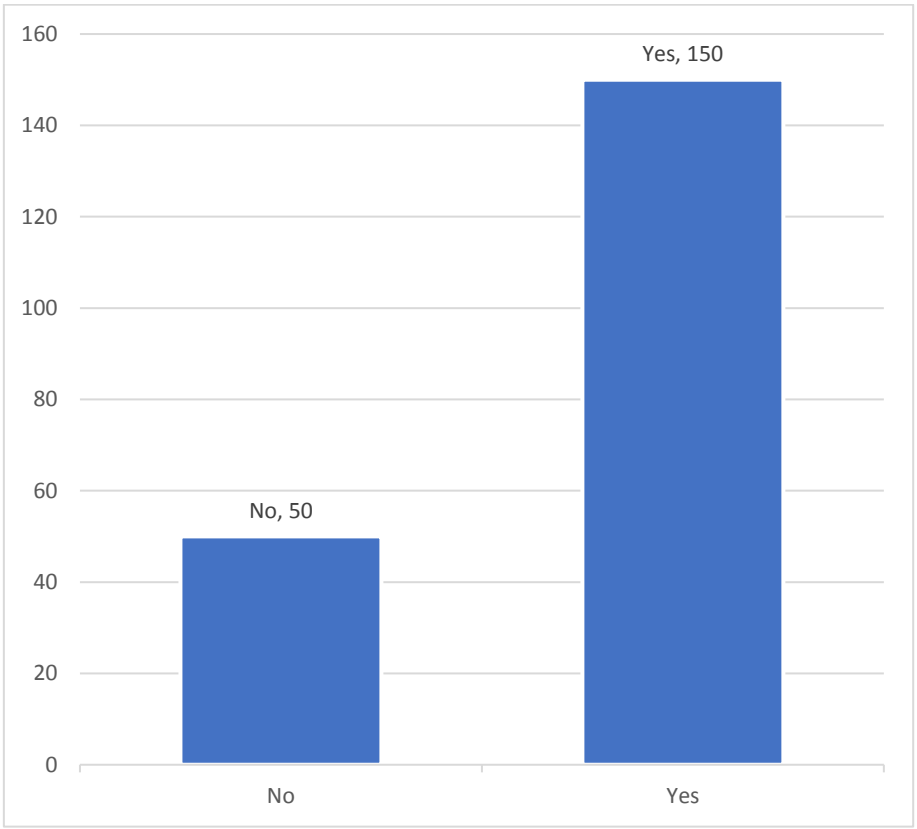
CHART NO. 9



FREQUENCY OF FEVER

FEVER	Frequency	Percent
No	50	25.0
Yes	150	75.0
Total	200	100.0

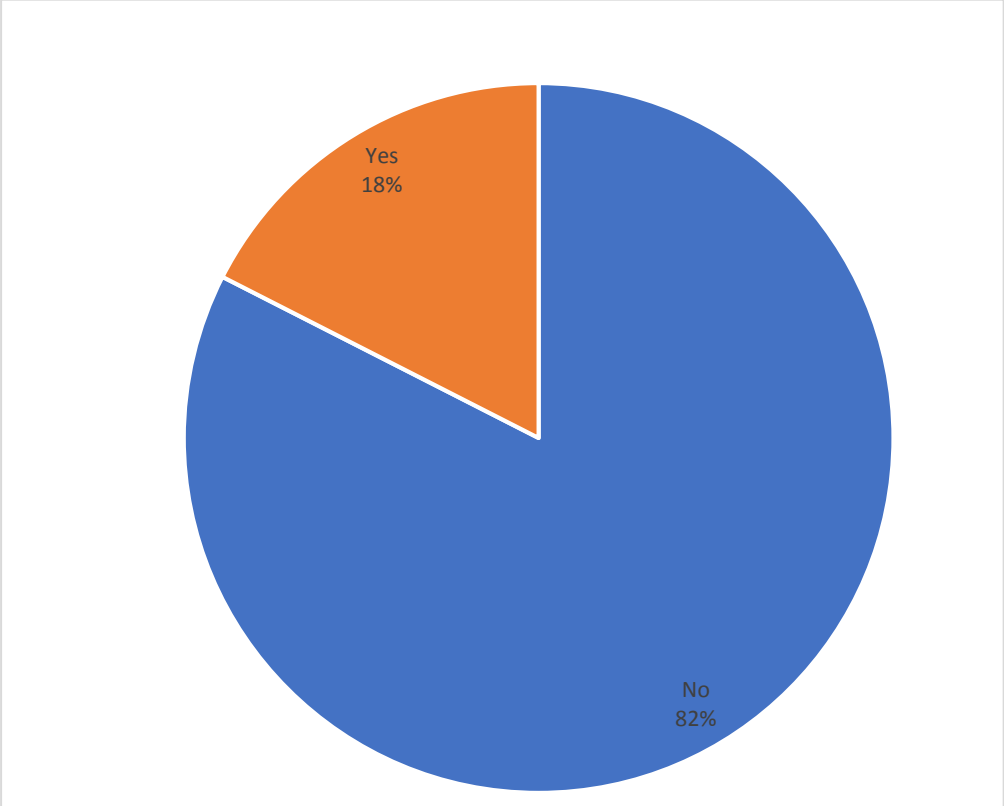
CHART NO.10



FREQUENCY OF MYALGIA

MYALGIA	Frequency	Percent
No	165	82.5
Yes	35	17.5
Total	200	100.0

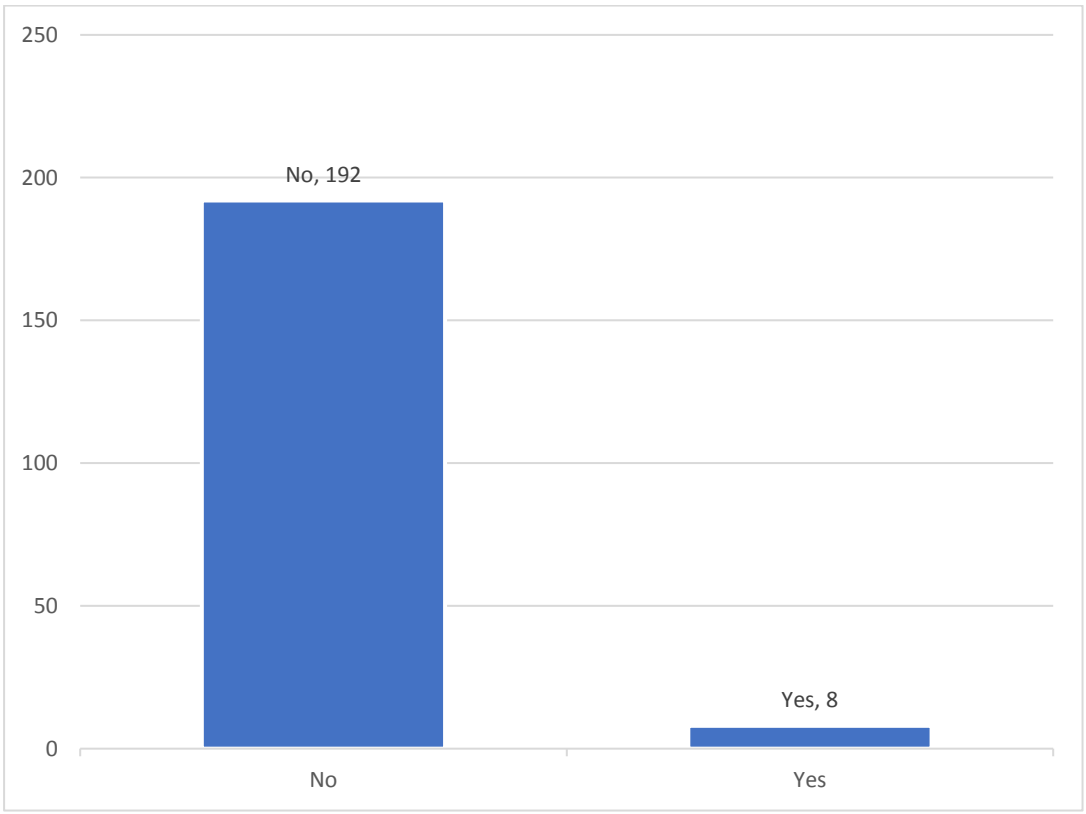
CHART NO.11



FREQUENCY OF FATIGUE

FATIGUE	Frequency	Percent
No	192	96.0
Yes	8	4.0
Total	200	100.0

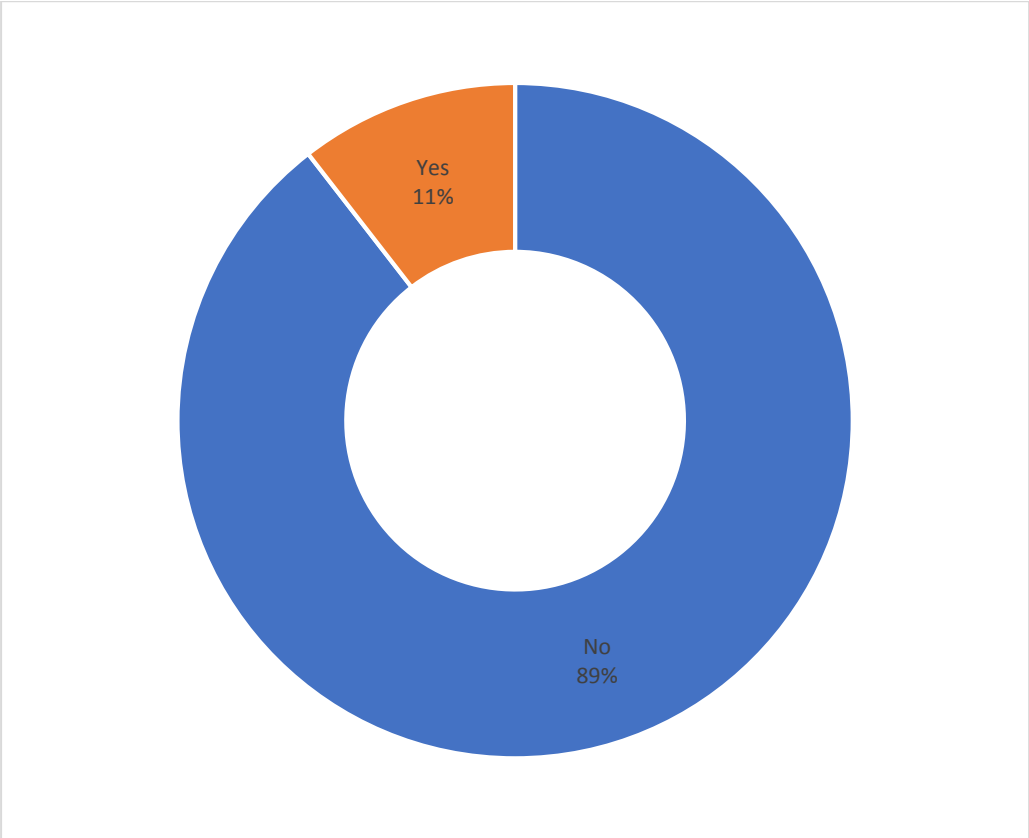
CHART NO.12



FREQUENCY OF SORE THROAT

SORE THROAT	Frequency	Percent
No	179	89.5
Yes	21	10.5
Total	200	100.0

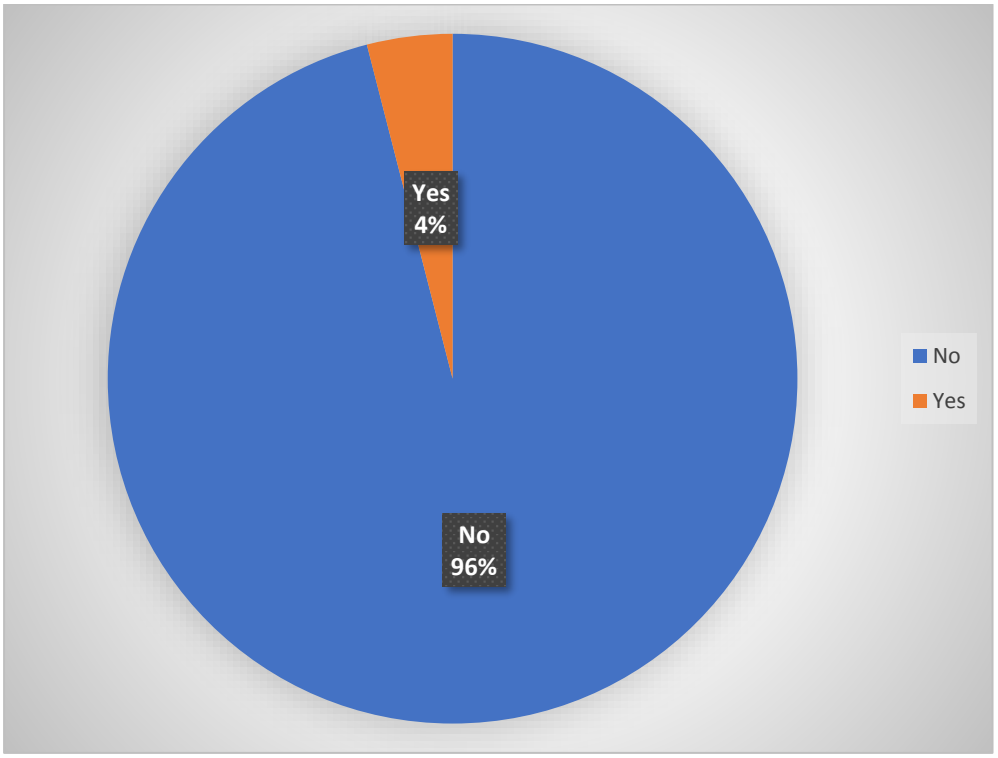
CHART NO. 13



FREQUENCY OF RUNNING NOSE

RUNNING NOSE	Frequency	Percent
No	192	96.0
Yes	8	4.0
Total	200	100.0

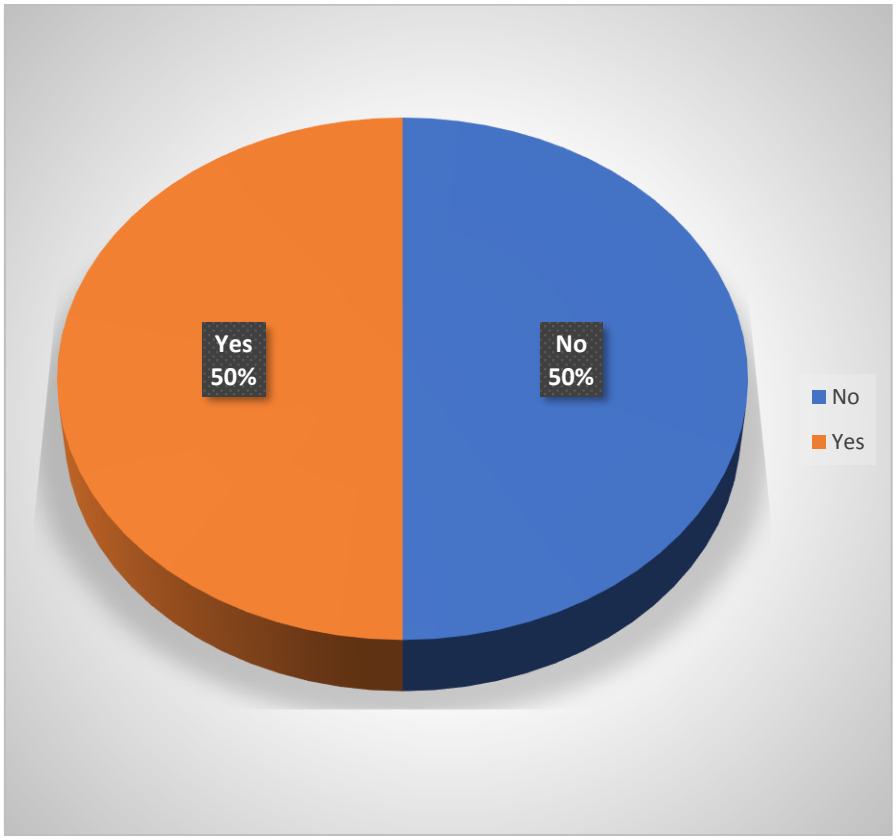
CHART NO. 14



FREQUENCY OF COUGH

COUGH	Frequency	Percent
No	100	50.0
Yes	100	50.0
Total	200	100.0

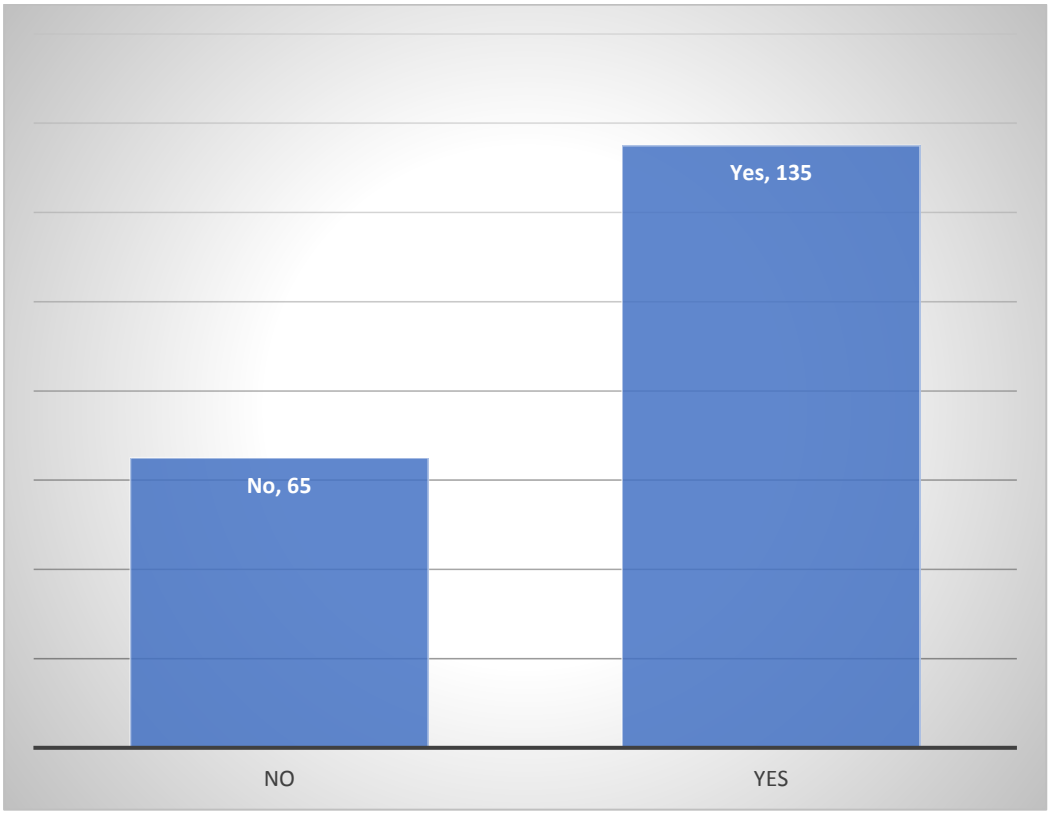
CHART NO.15



FREQUENCY OF BREATHLESSNESS

BREATHLESSNESS	Frequency	Percent
No	65	32.5
Yes	135	67.5
Total	200	100.0

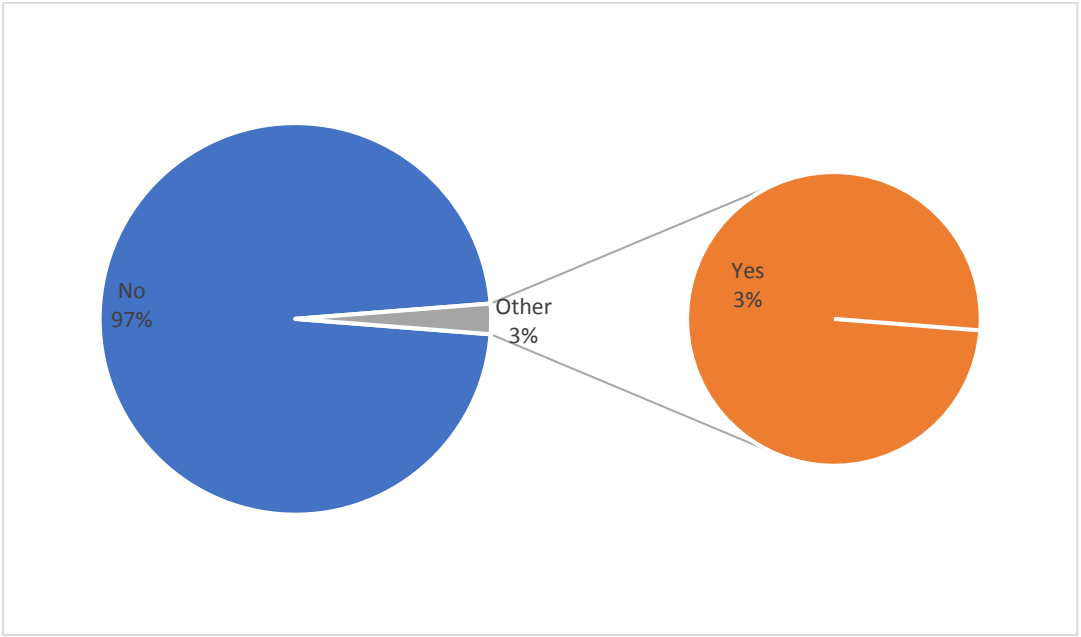
CHART NO.16



FREQUENCY OF LOOSE STOOLS

LOOSE STOOLS	Frequency	Percent
No	195	97.5
Yes	5	2.5
Total	200	100.0

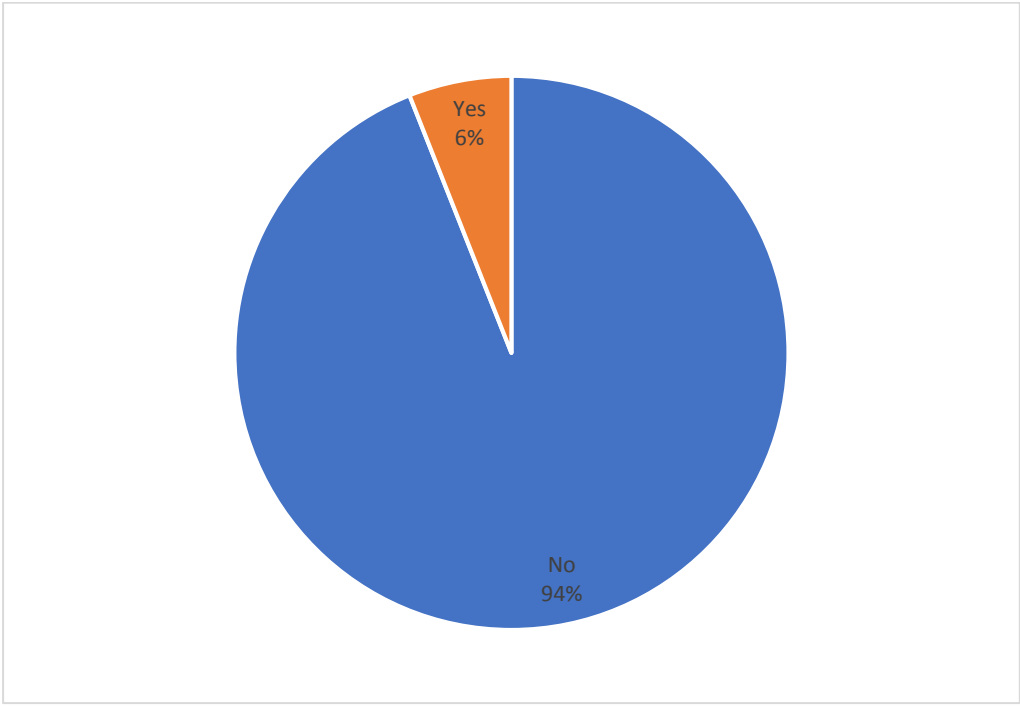
CHART NO.17



FREQUENCY OF LOSS OS SMELL/TASTE

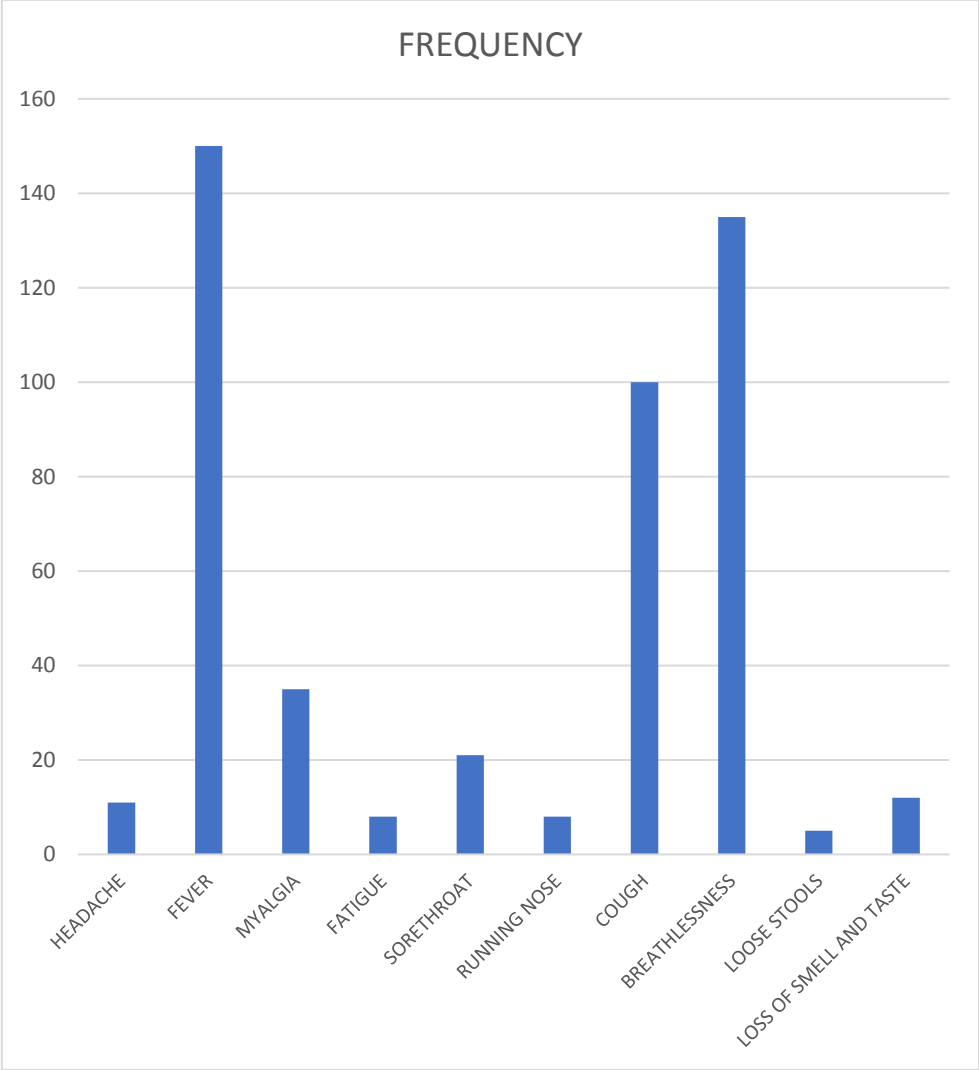
LOSS OF SMELL/TASTE	Frequency	Percent
No	188	94.0
Yes	12	6.0
Total	200	100.0

CHART NO.18



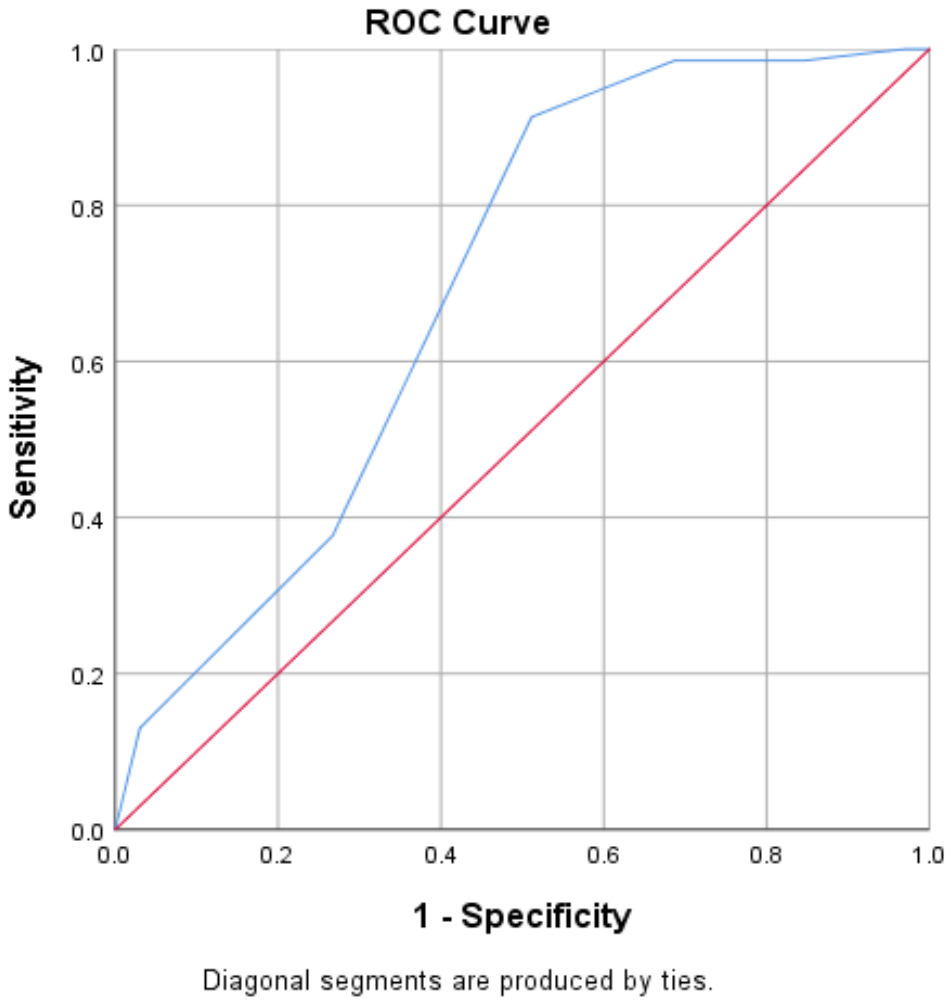
OVERVIEW OF SYMPTOMATOLOGY

CHART NO.19



qCSI SCORE SENSITIVITY AND SPECIFICITY

CHART NO. 20



qCSI SCORE SENSITIVITY AND SPECIFICITY

O2 FLOW RATE (L/MIN) * QCSI SCORE (POINTS) Crosstabulation					
			QCSI SCORE (POINTS)		Total
			>9.5	<9.5	
O2 FLOW RATE (L/MIN)	>10	Count	63	6	69
		% within O2 FLOW RATE (L/MIN)	91.3%	8.7%	100.0%
	<10	Count	67	64	131
		% within O2 FLOW RATE (L/MIN)	51.1%	48.9%	100.0%
Total		Count	130	70	200
		% within O2 FLOW RATE (L/MIN)	65.0%	35.0%	100.0%

AFTER 24 HRS	Cut-off value	AUC	P-value	Sens	Spec	PPV	NPV
O2 FLOW RATE (L/min)	9.5	0.696	<0.0001	48.46%	91.43%	91.30%	48.85%

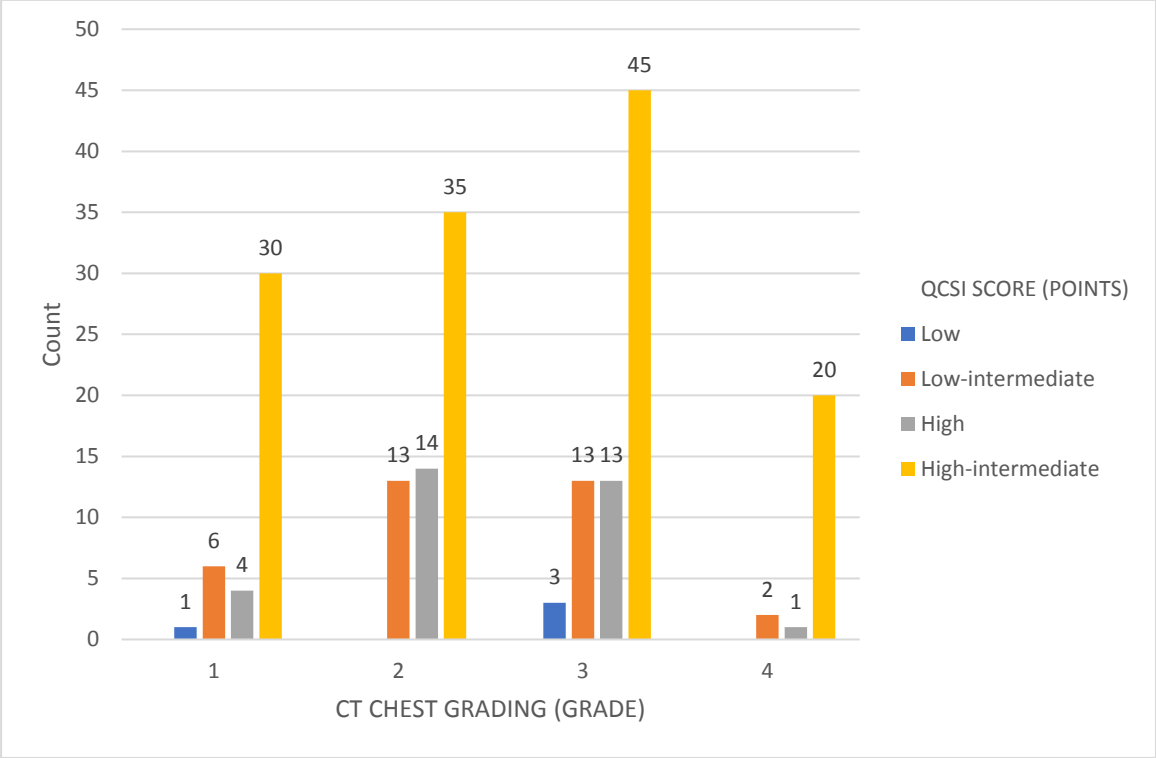
CORRELATION OF CT CHEST GRADING WITH QCSI SCORE

CT CHEST GRADING (GRADE) * QCSI SCORE (POINTS) Crosstabulation

			QCSI SCORE (POINTS)				Total	P-value
			Low	Low-intermediate	High	High-intermediate		
CT CHEST GRADING (GRADE)	1	Count	1	6	4	30	41	0.176
		% within CT CHEST GRADING (GRADE)	2.4%	14.6%	9.8%	73.2%	100.0%	
	2	Count	0	13	14	35	62	
		% within CT CHEST GRADING (GRADE)	0.0%	21.0%	22.6%	56.5%	100.0%	
	3	Count	3	13	13	45	74	
		% within CT CHEST GRADING (GRADE)	4.1%	17.6%	17.6%	60.8%	100.0%	
	4	Count	0	2	1	20	23	
		% within CT CHEST GRADING (GRADE)	0.0%	8.7%	4.3%	87.0%	100.0%	
Total		Count	4	34	32	130	200	
		% within CT CHEST GRADING (GRADE)	2.0%	17.0%	16.0%	65.0%	100.0%	

CORRELATION OF CT CHEST GRADING WITH QCSI SCORE

CHART NO.21



Correlations				
			QCSI SCORE (POINTS)	
Kendall's tau_b	CT CHEST GRADING (GRADE)	Correlation Coefficient	0.021	
		P-value	0.720	

DISCUSSION

In our study which included 200 patients, 69 % were males, and the remaining 31 % were females. This is similar to that of studies 1,2,5 and 6. In one study done by Huang et al, nearly 73% of patients were male (2). In another study by Guan et al which includes 1099 patients,58.1% were males. (1). The median age was 56 years in our study. In Guan et al, the median age was 47 years.

The majority of the patients were in the > 61 age group which constitutes 39.5 % of the total population. This is in contrast with studies 1 and 2. Both studies showed that the 15 – 49 age group is more involved.

The major comorbidities encountered in this study were T2DM and SHT which constitute 37 % and 34% respectively. A meta-analysis by Kumar et al showed the prevalence of covid was 11% (22). Another study also reported that the prevalence is around 10% in covid-19 patients. (23). One study revealed that 29.5 % of people who were admitted for covid-19 had a history of hypertension. (21). In our population, the number of patients who had hypertension and diabetes is quite high compared with other studies.

The majority of the patients had a fever as admitting symptom which constitutes 75% followed by breathlessness(67.5%), cough (50%), myalgia (17.5%), and remaining others. The most common symptom was cough (67.8%) followed by fever (43%) in a study done by Guan et al.(1) They reported percentage of people who were having breathlessness is only 18.7% which is not

consistent with our finding that 67.5 % of people presented to the hospital with complaints of breathlessness. Breathlessness is the second most common symptom in our group.

They also reported that loose stools as an uncommon symptom. This is similar to our findings that loose stools in present in 2.5% of people.

Performance of quick covid-19 severity in predicting early clinical decompensation in the form of oxygen requirement increased to 10 L or more, high flow oxygen, non-invasive or invasive ventilation or death has sensitivity 48.46 %; specificity 91.43%; positive predictive value(PPV) 91.30% .negative predictive value (NPV)48.85 % with a significant p-value of < 0.0001. A similar study using quick covid severity index done by Rodriguez Nava et al showed a sensitivity of 23.5-42.9%; specificity of 90.5-97.1%; PPV of 58.9-83.2%; NPV of 72.7-78 %. (6)

None of the patients in this study group deteriorated severe enough to put them in invasive or noninvasive ventilation and also no death in this study group during 24 hours of observation.

On CT chest grading,37 % of patients had grade 3 pneumonia followed by 31 % had grade 2,20.5 % had grade 1 and 11.5 % had grade 4. On correlating CT chest grading and quick covid severity index, there was no significant correlation between them.

SUMMARY

- In our study which included 200 patients, 69 % were males, and the remaining 31 % were females. The median age was 56 years.
- The majority of the patients were in the > 61 age group which constitutes 39.5 % of the total population.
- The major comorbidities encountered in this study were T2DM and SHT which constitute 37 % and 34% respectively.
- The majority of the patients had fever as admitting symptom which constitutes 75% followed by breathlessness(67.5%), cough (50%), myalgia (17.5%), and remaining others.
- Performance of quick covid-19 severity in predicting early clinical decompensation in the form of oxygen requirement increased to 10 L or more, high flow oxygen, noninvasive or invasive ventilation or death has sensitivity 48.46 %; specificity 91.43%; positive predictive value 91.30% .negative predictive value 48.85 % with a significant p-value of < 0.0001.
- None of the patients in this study group deteriorated severe enough to put them in invasive or noninvasive ventilation and also no death in this study group during 24 hours of observation.
- On CT chest grading,37 % of patients had grade 3 pneumonia followed by 31 % had grade 2,20.5 % had grade 1 and 11.5 % had grade 4.

CONCLUSION

The quick covid-19 severity index is a very useful clinical tool that can predict early clinical decompensation of covid-19 patients with high specificity and positive predictive value, even though the score has low sensitivity and low negative predictive value. The finding had statistical significance. However, the score did not correlate with the CT severity score.

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PROFORMA FOR QUICK COVID-19 SEVERITY INDEX

INSTITUTE OF INTERNAL MEDICINE

RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL,

CHENNAI – 3

Name: **Age / Sex:** **Town:**

District:

IP No.: **D.O.A.**

Address with Mobile No.:

Symptoms:

1.headache

2.fever

3.myalgia

4.fatigue

5.sore throat

6.running nose

7.cough

8.shortness of breath

9.loose stools

10.altered sensorium

11.loss of smell/taste

12.anorexia/nausea/vomiting

Covid swab details (positive or negative)

CT chest (grade or severity)

Co-morbids: DM/SHT /CKD/ IHD / COPD / Old PT / DCLD / Con. Tissue Disease / Hypothyroid / Others

Investigations	**Day 1**	**Day**	**Day**	**Day**	**Day**
TC					
Differential count					
Hb					
Platelets					
Blood Sugar					
Bl. Urea / Creat.					
TB / DB					
OT / PT					
Na+ / K+					
PT/INR/aptt					
CRP					
LDH					
FERRITIN					
D DIMER					

VARIABLES	**AT ADMISSION**	**AFTER 24 hours**
Respiratory rate		
Spo2		
Oxygen flow rate		

INFORMATION SHEET

We are conducting a study on on **"Utility of quick covid-19 severity index in predicting early clinical decompensation in hospitalised patients with covid-19"** , among patients attending Rajiv Gandhi Government General Hospital, Chennai and for that your specimen may be valuable to us.

We are selecting certain cases and if you are found eligible, we may be using your blood samples to do certain tests.

The privacy of the patients in the research will be maintained throughout the study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.

Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time; your decision will not result in any loss of benefits to which you are otherwise entitled.

The results of the special study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.

Signature of Investigator Signature of Participant

ஆராய்ச்சி தகவல் தாள்

ஆராய்ச்சி தலைப்பு

UTILITY OF QUICK COVID 19 SEVERITY INDEX IN PREDICTING EARLY CLINICAL DECOMPENSATION IN HOSPITALISED PATIENTS WITH COVID 19

ஆய்வாளர் :

பங்கேற்பாளர் பெயர் :

சென்னை ராஜீவ் காந்தி அரசு பொது மருத்துவமனைக்கு வரும் நோயாளிகளிடம் ஆராய்ச்சி நடைபெறுகிறது. அதற்கு தாங்கள் ஒத்துழைக்குமாறு கேட்டுக் கொள்கிறோம்.

நீங்களும் இந்த ஆராய்ச்சியில் பங்கேற்க நாங்கள் விரும்புகிறோம். இதில் உங்களுடைய தகவல்களை ஆராய்வோம். இதனால் தங்களது ஆய்வறிக்கையோ, அன்றாட செயல்பாடுகளோ பாதிக்கப்படாது என்று தெரிவத்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியின் முடிவுகளை அல்லது கருத்துக்களை வெளியிடும் போதோ அல்லது ஆராய்ச்சியின் போதோ தங்களது பெயரையோ அல்லது அடையாளங்களையோ வெளியிடமாட்டோம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியில் பங்கேற்பது தங்களுடைய விருப்பத்தின் பேரில்தான் இருக்கிறது. மேலும் நீங்கள் எந்த நேரமும் இந்த ஆராய்ச்சியில் இருந்து பின் வாங்கலாம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

இந்த ஆராய்ச்சியின் முடிவுகளையும் நோயின் தன்மை பற்றியும் ஆராய்ச்சியின் போது அல்லது ஆராய்ச்சி முடிவின்போது தங்களுக்கு அறிவிப்போம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

ஆராய்ச்சியாளர் கையொப்பம் பங்கேற்பாளர் கையொப்பம்

தேதி:

PATIENT CONSENT FORM

Study Detail	:	**"Utility of quick covid-19 severity index in predicting early clinical decompensation in hospitalised patients with covid-19"**
Study Centre	:	Rajiv Gandhi Government General Hospital, Chennai.
Patient's Name	:	
Patient's Age	:	
Identification Number	:	

Patient may check (√) these boxes

- I confirm that I have understood the purpose of procedure for the above study. I have the opportunity to ask question and all my questions and doubts have been answered to my complete satisfaction.
- I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving reason, without my legal rights being affected.
- I understand that sponsor of the clinical study, others working on the sponsor's behalf, the ethical committee and the regulatory authorities will not need my permission to look at my health records, both in respect of current study and any further research that may be conducted in relation to it, even if I withdraw from the study I agree to this access. However, I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from this study.
- I agree to take part in the above study and to comply with the instructions given during the study and faithfully cooperate with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or well being or any unexpected or unusual symptoms.
- I hereby consent to participate in this study.
- I hereby give permission to undergo detailed clinical examination and blood investigations as required.

Signature of investigator Signature/Thumb impression of participant

Patient name and address

ஆராய்ச்சி ஒப்புதல் படிவம்

ஆராயச்சியின் தலைப்பு

UTILITY OF QUICK COVID 19 SEVERITY INDEX IN PREDICTING EARLY CLINICAL DECOMPENSATION IN HOSPITALISED PATIENTS WITH COVID 19

ஆய்வு நிலையம் : சென்னை மருத்துவக் கல்லூரி
சென்னை – 3.

பங்கு பெறுவரின் பெயர் : உறவுமுறை:

பங்குபெறுபவரின் எண் :

மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டது.

நான் இவ்வாய்வில் தன்னிச்சையாகதான் பங்கேற்கிறேன். எந்த காரணத்தினாலோ எந்த கட்டத்திலும் எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன்.

இந்த ஆய்வு சம்பந்தமாகவோ, இதை சார்ந்த மேலும் ஆய்வு மேற்கொள்ளும் போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன்.

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும், பரிசோதனை முடிவுகளையும் மற்றும் சிகிச்சை தொடர்பான தகவல்களையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக்கொள்ளவும் அதை பிரசுரிக்கவும் என் முழு மனதுடன் சம்மதிக்கின்றேன்.

இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக்கொள்கிறேன். எனக்கு கொடுக்கப்பட்ட அறிவுரைகளின்படி நடந்து கொள்வதுடன் இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்று உறுதியளிகிறேன். என் உடல் நலம் பாதிக்கப்பட்டாலோ அல்லது எதிர்பாராத வழக்கத்திற்கு மாறான நோய்க்குறி தென்பட்டாலோ உடனே அதை மருத்துவ அணியிடம் தெரிவிப்பேன் என உறுதி அளிக்கிறேன்.

பங்கேற்பவரின் கையொப்பம் ……..…….. இடம்……..…. தேதி……

கட்டைவிரல் ரேகை

பங்கேற்பவரின் பெயர் மற்றும் விலாசம் ……

ஆய்வாளரின் கையொப்பம் …….. இடம்…….. தேதி…….

ஆய்வாளரின் பெயர் ……

Curiginal

Document Information

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Sources included in the report

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SA	**Tamil Nadu Dr. M.G.R. Medical University / Assessment of risk factors and laboratory parameters among critically ill covid 19 patients and to determine their association with disease severity.docx** Document Assessment of risk factors and laboratory parameters among critically ill covid 19 patients and to determine their association with disease severity.docx (D123509101) Submitted by: sumitravellaiammal@gmail.com Receiver: sumitravellaiammal.mgrmu@analysis.urkund.com	2
W	URL: https://www.frontiersin.org/articles/700449 Fetched: 2021-08-21T07:51:08.4300000	1
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INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI 600 003

EC Reg.No.ECR/270/Inst./TN/2013/RR-16
Telephone No.044 25305301
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CERTIFICATE OF APPROVAL

To
DR.S.PALANISAMY,
Post Graduate, MD (General Medicine),
Institute of Internal Medicine,
Madras Medical College,
Chennai -600 003.

Dear DR. S.PALANISAMY,

The Institutional Ethics Committee has considered your request and approved your study titled **"UTILITY OF QUICK COVID 19 SEVERITY INDEX IN PREDICTING EARLY CLINICAL DECOMPENSATION IN HOSPITALISED PATIENTS WITH COVID 19"- NO.30052021.** The following members of Ethics Committee were present in the meeting held on **19.05.2021** conducted at Madras Medical College, Chennai 3.

1. Prof.P.V.Jayashankar :Chairperson
2. Prof.N.Gopalakrishnan,MD.,DM., FRCP, Director, Inst.of Nephrology,MMC,Ch. : Member Secretary
3. Prof. K.M.Sudha, Prof. Inst. of Pharmacology,MMC,Ch-3 : Member
4. Prof. Alagarsamy Jamila ,MD, Vice Principal, Stanley Medical College, Chennai : Member
5. Prof.Rema Chandramohan,Prof.of Paediatrics,ICH,Chennai : Member
6. Prof.S.Lakshmi, Prof. of Paediatrics ICH Chennai :Member
7. Tmt.Arnold Saulina, MA.,MSW., :Social Scientist
8. Thiru S.Govindasamy, BA.,BL,High Court,Chennai : Lawyer
9. Thiru K.Ranjith, Ch- 91 : Lay Person

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

Member Secretary - Ethics Committee

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE
CHENNAI-600 003.

name	age	sex	residence	ct chest grading (grade)	T2DM	SHT	CKD	CAD	OTHERS	NLR	CRP (mg/l)	at admission Respiratory rate (/min)	SPO2 (%)	O2 FLOW RATE (L/min)	AFTER 24 HRS Respiratory rate(/min)	O2 FLOW RATE (L/min)	SPO2 (%)	qCSI score (points)	risk level	headache	fever	myalgia	fatigue	sorethroat	running nose	cough	breathlessness	loose stools	loss of smell/taste
Sivagnanam	74	male	ganapathy nagar	1	no	yes	no	no	no	5.6	74.1	18	89	2	20	4	95	2	low	no	yes	yes	no	yes	no	yes	no	no	yes
munnabai	52	female	saidapet	2	no	yes	no	no	no	6	12.4	16	88	2	20	10	92	5	low-	no	yes	yes	no	yes	no	no	yes	no	no
lalithambal	50	female	madipakkam	1	yes	yes	no	no	no	6	27.5	20	88	4	20	10	94	9	high-	no	no	yes	no	no	no	no	yes	no	no
ramesh	49	male	perambur	3	no	no	no	no	no	10	28.1	20	87	6	18	6	94	10	high	no	yes	no	no	no	no	yes	no	no	no
gunasekaran	68	male	kolathur	2	no	no	no	yes	no	10	28.1	20	88	2	24	12	92	5	low-	no	no	yes	no	no	no	no	yes	no	no
arputham	74	female	kolathur	1	yes	no	no	no	no	4	12.4	18	88	4	18	4	95	9	high-	no	yes	yes	no	no	no	no	no	no	no
ann grace	35	female	shenoy nagar	2	no	no	no	no	no	4	76	18	88	4	18	10	94	9	high-	no	yes	no	no	no	no	yes	no	no	no
ramadoss	68	male	nandhanam	3	yes	yes	no	no	no	22	67.2	24	86	6	24	15	92	11	high	no	no	no	no	no	no	no	no	no	no
vijayalakshmi	67	female	vetrinagar	3	no	no	no	no	no	3	98.8	22	85	6	24	15	93	11	high	no	yes	no	no	no	no	yes	yes	no	no
kanagambal	50	female	saidapet	2	no	no	no	no	no	22	74.5	22	85	6	22	12	94	10	high	no	yes	no	no	no	no	yes	yes	no	no
ananthnathan	86	male	madipakkam	2	yes	yes	no	no	no	9	113	18	87	6	22	12	92	10	high	no	yes	yes	no	no	no	no	no	no	no
jayakrishna	44	male	saidapet	3	no	yes	no	no	no	5	40.1	18	89	4	16	4	96	6	low-	no	yes	yes	no	no	no	no	no	no	no
devan	59	male	nungambakkam	4	yes	yes	no	no	no	10	117	22	78	6	22	15	92	10	high	no	yes	no	no	no	no	no	yes	no	no
mahadevan	60	male	vennampathi	2	no	no	no	no	no	7	112	23	82	6	24	12	92	11	high	no	yes	no	no	yes	yes	yes	yes	no	yes
venkatesh	69	male	ayyapakkam	3	no	no	no	no	no	3	59.1	20	86	4	22	15	92	9	high-	no	yes	yes	no	no	no	yes	no	no	no
raju	80	male	thirupathur	2	yes	yes	no	yes	no	11	76.6	26	82	6	24	10	92	11	high	no	yes	no	no	no	no	yes	no	no	no
selvi	50	female	maduravoyal	3	no	no	no	no	no	7	35.4	18	87	5	18	10	92	10	high	no	yes	no	no	no	no	no	no	no	yes
selvi	52	female	nungambakkam	4	yes	yes	no	no	no	12	45.7	20	85	6	22	15	92	10	high	no	yes	yes	no	no	no	no	yes	no	no
vignesh	27	male	t.nagar	3	no	no	no	no	no	4	16.3	22	83	6	22	15	93	10	high	no	yes	no	no	yes	no	yes	no	no	no
mahendra	40	male	jothiyammal	2	yes	no	no	no	no	2	27.4	18	89	4	18	4	96	6	low-	no	no	no	no	no	no	no	yes	no	no
sanjay kumar	34	male	velachery	1	no	no	no	no	no	4	38.2	18	83	6	20	12	92	10	high	no	yes	no	no	no	no	yes	yes	no	no
manoranjitham	58	female	GKM colony	3	no	no	no	no	no	3	13.4	16	88	2	16	4	96	5	low-	no	no	no	no	no	no	no	yes	no	no
padmanabhan	72	male	maduravoyal	2	yes	yes	no	no	yes	11	84.1	18	87	4	18	6	96	9	high-	no	no	yes	no	no	no	yes	no	no	no
vennila	72	female	kk nagar	2	no	yes	no	yes	no	2	7	18	89	2	18	6	97	5	low-	no	no	no	no	no	no	yes	no	no	no
rani	58	female	kk nagar	3	no	no	no	no	no	3	5.6	20	86	4	20	6	93	9	high-	yes	no	no	no	no	no	no	yes	no	no
sujatha	45	female	thiru.v.ka nagar	4	no	no	no	no	no	12	136	20	84	6	22	12	92	10	high	no	yes	no	no	no	no	no	yes	no	no
narasimman	80	male	thiruvallur	3	no	no	no	no	no	7	88.5	18	89	3	18	4	96	6	low-	no	yes	no	no	no	no	no	no	no	no
srinivasan	32	male	alapakkam	3	no	no	no	no	no	8	106	24	81	6	20	15	92	11	high	no	no	no	no	no	no	yes	yes	no	no
dinesh	33	male	velachery	1	no	no	no	no	no	3	124	20	85	6	20	10	92	11	high	no	no	no	no	no	no	yes	yes	no	no
deepanraj	42	male	madipakkam	3	no	no	no	no	no	3	6.3	20	86	4	20	4	96	10	high	no	yes	no	no	no	no	no	yes	no	no
george	59	male	arumbakkam	1	no	yes	no	no	no	6	76.7	22	88	5	20	10	92	10	high	no	yes	no	no	no	no	no	yes	no	no
gajendrababu	80	male	madipakkam	2	no	yes	no	no	no	6	3.2	20	88	2	18	6	94	5	low-	no	yes	no	no	no	no	no	yes	no	no
mohan	68	male	ayyapakkam	4	yes	no	no	no	yes	4	96.4	24	82	5	20	10	94	11	high	no	yes	no	no	no	no	no	no	no	no
sankaranarayanan	75	male	chromepet	1	yes	no	no	no	no	2	24	16	89	4	16	2	95	6	low-	no	yes	no	no	no	no	no	yes	no	no
gerald	38	male	avadi	1	no	yes	no	no	no	2	12.8	18	89	4	18	4	95	6	low-	no	yes	yes	no	no	no	no	no	no	no
boopalan	53	male	avadi	2	no	no	no	no	no	3	70	24	88	4	20	12	93	10	high	no	no	no	no	no	no	yes	no	no	no
venugopal	64	male	mangadu	1	no	yes	no	no	no	23	26.8	18	87	3	18	5	95	10	high	yes	yes	no	no	no	no	no	yes	no	no
mahadevan	58	male	kamarajar nagar	1	no	no	no	no	no	4	158	20	87	6	18	4	94	10	high	no	yes	no	no	no	no	no	yes	no	no
saroja	80	female	perambur	4	yes	yes	no	no	no	6	146	20	84	6	20	10	93	10	high	no	no	no	no	no	no	yes	no	no	no
rajkumar	42	male	thiruvallur	2	no	no	no	no	no	6	34.7	24	86	5	22	4	96	11	high	no	no	no	no	no	no	no	yes	no	no
suganthi	26	female	muduchur	1	yes	no	no	no	no	4	101	20	84	6	18	15	92	10	high	no	no	yes	no	no	no	yes	yes	no	no
prabhu	35	male	velachery	3	no	no	no	no	no	7	287	20	80	6	24	15	92	10	high	no	yes	no	no	no	no	yes	yes	no	no
jothi	65	female	george town	2	yes	yes	no	no	no	15	121	18	82	6	20	15	92	10	high	no	yes	no	no	no	no	yes	yes	no	no
veerapathran	44	male	chengalpattu	2	yes	no	no	no	no	3	70	24	83	6	24	15	92	11	high	no	yes	no	no	no	no	no	yes	no	no
viswanathan	35	male	iyyapanthangal	3	no	no	no	no	no	4	22.2	20	85	6	22	12	93	10	high	no	yes	no	no	no	no	yes	yes	no	yes
gopalakrishnan	75	male	kk nagar	1	yes	yes	no	no	no	6	76	26	85	6	24	15	92	11	high	no	yes	no	yes	yes	yes	yes	no	no	no
sumithavalli	45	female	mgr nagar	2	no	no	no	no	no	7	84	20	86	5	20	12	92	10	high	no	yes	yes	no	no	no	no	yes	no	no
saradha	58	female	cit nagar	2	no	no	no	no	no	3	69	20	87	6	20	10	94	10	high	no	yes	no	no	no	no	yes	yes	no	no
saranya	50	female	perambur	1	no	no	no	no	no	12	53.4	18	88	5	20	5	96	10	high	no	yes	no	no	no	no	yes	yes	no	no
mala	32	female	thiruninravur	1	no	no	no	no	no	4	23.7	24	84	6	20	15	92	11	high	no	no	no	no	no	no	no	yes	no	no
padmarani	65	female	vadapalani	1	yes	yes	no	no	no	3	13	20	87	5	18	4	94	10	high	no	yes	no	no	no	no	yes	no	no	no
usha	40	female	iyanpakkam	3	no	no	no	no	no	8	29.5	20	87	6	18	6	96	10	high	no	yes	no	no	no	no	yes	no	no	no
nagammal	65	female	tondiarpet	3	yes	no	no	no	no	3	97.4	25	83	6	26	10	94	11	high	no	yes	no	no	no	no	yes	yes	no	no
dhanraj	64	male	thiru.v.ka nagar	2	no	no	no	no	no	2	4.9	18	88	3	18	8	96	9	high-	no	yes	no	no	no	no	no	no	no	no

name	age	sex	residence	ct chest grading (grade)	T2DM	SHT	CKD	CAD	OTHERS	NLR	CRP (mg/l)	at admission Respiratory rate (/min)	SPO2 (%)	O2 FLOW RATE (L/min)	AFTER 24 HRS Respiratory rate(/min)	O2 FLOW RATE (L/min)	SPO2 (%)	qCSI score (points)	risk level	headache	fever	myalgia	fatigue	sorethroat	running nose	cough	breathlessness	loose stools	loss of smell/taste
usha	48	female	arakonam	3	no	no	no	no	no	3	34.5	24	84	6	24	10	93	11	high	no	yes	no	no	no	no	no	yes	no	no
rani	34	female	redhills	2	no	no	no	no	no	3	116	18	86	4	22	12	92	10	high	no	yes	no	no	no	no	no	yes	no	no
shanmugam	74	male	GKM colony	1	no	no	no	no	no	14	84.4	27	84	6	20	15	92	11	high	no	no	no	no	no	no	no	yes	no	no
shanmugam	72	male	koratur	3	no	no	no	no	no	9	54	24	83	6	24	12	92	11	high	no	yes	no	no	no	no	yes	no	no	no
ahmed meeran	71	male	adambakkam	3	yes	no	no	no	no	2	4.5	20	89	2	20	6	95	2	low	no	yes	no	no	no	yes	no	no	no	no
vela	54	female	puraisavakkam	4	yes	no	no	no	no	4	49.4	20	83	4	20	8	96	9	high-	no	no	no	no	no	no	yes	yes	no	no
somasundaram	70	male	iyyapanthangal	3	yes	yes	no	no	no	14	10	29	79	6	22	15	92	12	high	no	no	no	no	yes	no	yes	yes	no	no
panneerselvam	63	male	anna nagar	3	no	no	no	no	no	5	12	20	87	3	20	6	95	9	high-	no	yes	no	no	no	no	no	yes	yes	no
banu	62	female	nesapakkam	3	yes	no	no	no	yes	6	63.7	24	87	6	18	6	96	11	high	no	yes	no	no	no	no	no	yes	no	no
mohan	33	male	shenoy nagar	3	no	no	no	no	no	9	63.7	30	80	6	20	10	93	12	high	no	yes	no	no	no	no	no	yes	no	no
senthura pandiyan	26	male	anna nagar	2	no	no	no	no	no	22	112	29	78	6	20	12	94	12	high	no	yes	no	no	no	no	yes	yes	no	no
mohan	70	male	pattabiram	3	yes	yes	no	no	no	4	167	25	82	4	20	8	94	10	high	no	yes	no	no	no	no	no	yes	no	no
lakshmi	46	female	mandaveli	3	yes	no	no	no	no	6	13.2	24	84	6	20	15	92	11	high	no	yes	no	no	no	no	no	yes	no	no
suresh	56	male	porur	2	no	no	no	no	no	9	15.7	20	83	4	24	12	92	9	high-	no	yes	no	no	no	no	yes	yes	no	no
saravanan	49	male	thiruvallur	3	no	no	no	no	no	9	30.1	22	84	6	24	10	92	9	high-	no	yes	no	no	no	no	yes	yes	no	no
sulthan basha	25	male	nellore	3	no	no	no	no	no	3	3.1	28	84	6	26	6	92	11	high	no	yes	no	no	no	no	no	yes	no	no
kuppan	71	male	west mambalam	4	yes	yes	no	no	no	11	100	24	85	6	22	10	94	11	high	no	no	no	no	no	no	yes	yes	no	no
santhanam	62	male	avadi	4	yes	no	no	yes	no	15	55.7	22	84	5	20	6	95	10	high	no	yes	no	no	no	no	yes	no	no	no
narayanan	84	male	thendral nagar	2	yes	no	no	yes	no	10	74.1	20	88	3	22	4	92	9	high-	no	yes	yes	no	no	no	no	no	no	no
noah	49	male	puzhal	4	yes	no	no	no	no	11	113	30	80	6	22	15	92	12	high	no	no	yes	no	no	no	yes	yes	no	no
karthikeyan	29	male	mugappair	2	no	no	no	no	no	4	88.4	24	89	3	24	8	92	7	high-	no	yes	no	no	yes	no	yes	yes	no	no
ravi	51	male	koratur	3	no	no	no	no	no	5	41.8	26	89	3	26	10	92	7	high-	no	yes	no	no	no	no	yes	yes	no	no
lalith kumar	54	male	GKM colony	3	yes	yes	yes	no	no	30	58.9	22	87	4	20	2	94	9	high-	no	no	yes	yes	no	no	no	no	no	no
pannerselvam	73	male	alwarpet	2	no	yes	no	yes	no	10	87	20	88	2	20	4	93	5	low-	no	no	no	no	no	no	yes	yes	no	no
pencilliah	65	male	puzhal	2	no	yes	no	yes	no	18	302	30	78	6	24	15	92	12	high	no	yes	no	no	no	no	yes	no	no	no
srinivasan	75	male	therku mada	1	yes	no	no	no	yes	2	12	20	88	2	20	8	92	5	low-	no	no	no	no	no	no	no	yes	no	no
shanthi	85	female	ekatuthangal	3	yes	yes	no	no	no	4	70	24	86	5	22	4	94	11	high	yes	yes	no	no	no	no	yes	yes	no	no
tamilarasi	27	male	otteri	4	no	no	no	no	no	4	33.5	20	86	4	28	10	92	10	high	yes	yes	no	no	no	no	yes	yes	no	no
krishnaveni	66	female	thirusoolam	1	yes	yes	no	no	no	3	9.1	28	85	6	24	6	94	11	high	no	yes	no	no	no	no	yes	no	no	no
loganathan	54	male	t.nagar	3	yes	no	no	no	no	23	53.6	24	86	2	20	4	94	6	low-	no	yes	no	no	no	no	yes	yes	no	no
srinivasan	43	male	chengalpattu	4	no	no	no	no	no	13	46	18	89	2	22	4	95	5	low-	no	yes	no	no	no	no	yes	no	no	no
ramachandran	67	male	periyamedu	1	yes	yes	no	no	no	10	59.6	30	82	6	24	15	93	12	high	no	yes	no	no	no	no	no	yes	no	no
hemalatha	56	female	manikandan nagar	2	yes	no	no	no	no	2	6.5	20	87	4	20	5	95	9	high-	no	yes	no	no	no	no	no	yes	no	no
chitramani	51	male	t.nagar	2	yes	yes	no	no	no	7	34	20	85	6	22	10	92	10	high	no	no	no	no	no	no	yes	yes	no	no
ganesan	55	male	ekatuthangal	3	no	yes	no	no	no	7	130	22	84	5	24	15	92	10	high	no	no	no	no	no	no	yes	yes	no	no
pattammal	65	female	thirunindravur	2	no	no	no	no	no	2	56	24	84	4	20	12	92	10	high	no	yes	no	no	no	no	yes	no	yes	no
kumar	47	male	koratur	1	yes	no	no	no	no	29	95.3	28	80	6	22	10	92	11	high	no	yes	no	no	no	no	no	no	no	yes
mohammed	67	male	avadi	3	no	yes	no	no	no	13	17.7	26	81	6	24	10	93	11	high	no	yes	no	no	yes	no	yes	yes	no	no
nagan	80	male	thiruvallur	3	no	no	no	no	no	11	125	32	82	6	24	10	93	12	high	no	yes	no	no	yes	no	yes	yes	no	no
krishnamoorthy	46	male	velmurugan nagar	3	no	yes	no	no	no	7	56	26	85	6	24	10	92	11	high	no	yes	no	no	yes	no	no	yes	no	no
govindaraj	68	male	alwarpet	2	yes	no	no	yes	no	4	72.2	24	84	4	28	10	93	10	high	no	yes	no	no	no	no	yes	yes	no	no
senthilkumar	52	male	choolaimedu	3	no	no	no	no	no	7	108	18	89	2	18	6	94	2	low	no	yes	no	no	no	no	no	yes	no	no
moulana	73	male	peerkaranai	1	no	yes	no	no	no	2	87.9	18	88	4	22	10	93	9	high-	no	yes	no	no	yes	yes	no	yes	no	no
aurangazeeb	60	male	pudhupet	3	no	no	no	no	no	4	69.2	20	89	4	22	4	94	6	low-	no	no	no	no	no	no	no	yes	no	no
gopinathan	39	male	anna nagar	1	yes	no	no	no	no	7	72	24	84	6	22	10	92	11	high	yes	yes	yes	yes	no	no	no	yes	no	no
bhavani	43	female	pattabiram	2	no	no	no	no	no	3	2.3	20	85	6	20	15	92	10	high	no	yes	yes	yes	no	no	yes	yes	yes	yes
rekha	32	female	thiruninravur	1	no	no	no	no	no	4	23.7	24	84	6	20	15	92	11	high	no	no	no	no	no	no	no	yes	no	no
vani	65	female	vadapalani	1	yes	yes	no	no	no	3	13	20	87	5	18	4	94	10	high	no	yes	no	no	no	no	yes	no	no	no
kumari	40	female	iyanpakkam	3	no	no	no	no	no	8	29.5	20	87	6	18	6	96	10	high	no	yes	no	no	no	no	yes	no	no	no
punithavalli	65	female	tondiarpet	3	yes	no	no	no	no	3	97.4	25	83	6	26	10	94	11	high	no	yes	no	no	no	no	yes	yes	no	no
hussain	64	male	thiru.v.ka nagar	2	no	no	no	no	no	2	4.9	18	88	3	18	8	96	9	high-	no	yes	no	no	no	no	no	no	no	no
senbagavalli	48	female	arakonam	3	no	no	no	no	no	3	34.5	24	84	6	24	10	93	11	high	no	yes	no	no	no	no	no	yes	no	no
abitha	34	female	redhills	2	no	no	no	no	no	3	116	18	86	4	22	12	92	10	high	no	yes	no	no	no	no	no	yes	no	no
pandurangan	74	male	GKM colony	1	no	no	no	no	no	14	84.4	27	84	6	20	15	92	11	high	no	no	no	no	no	no	no	yes	no	no

name	age	sex	residence	ct chest grading (grade)	T2DM	SHT	CKD	CAD	OTHERS	NLR	CRP (mg/l)	at admission Respiratory rate (/min)	SPO2 (%)	O2 FLOW RATE (L/min)	AFTER 24 HRS Respiratory rate(/min)	O2 FLOW RATE (L/min)	SPO2 (%)	qCSI score (points)	risk level	headache	fever	myalgia	fatigue	sorethroat	running nose	cough	breathlessness	loose stools	loss of smell/taste
muthukrishnan	72	male	koratur	3	no	no	no	no	no	9	54	24	83	6	24	12	92	11	high	no	yes	no	no	no	no	yes	no	no	no
selvam	71	male	adambakkam	3	yes	no	no	no	no	2	4.5	20	89	2	20	6	95	2	low	no	yes	no	no	no	yes	no	no	no	no
egambaram	34	male	velachery	1	no	no	no	no	no	4	38.2	18	83	6	20	12	92	10	high	no	yes	no	no	no	no	yes	yes	no	no
devi	58	female	GKM colony	3	no	no	no	no	no	3	13.4	16	88	2	16	4	96	5	low-	no	no	no	no	no	no	no	yes	no	no
muthukrishnan	72	male	maduravoyal	2	yes	yes	no	no	yes	11	84.1	18	87	4	18	6	96	9	high-	no	no	yes	no	no	no	yes	no	no	no
padma	72	female	kk nagar	2	no	yes	no	yes	no	2	7	18	89	2	18	6	97	5	low-	no	no	no	no	no	no	yes	no	no	no
chandra	58	female	kk nagar	3	no	no	no	no	no	3	5.6	20	86	4	20	6	93	9	high-	yes	no	no	no	no	no	no	yes	no	no
thenmozhi	45	female	thiru.v.ka nagar	4	no	no	no	no	no	12	136	20	84	6	22	12	92	10	high	no	yes	no	no	no	no	no	yes	no	no
narayanan	80	male	thiruvallur	3	no	no	no	no	no	7	88.5	18	89	3	18	4	96	6	low-	no	yes	no	no	no	no	no	no	no	no
elangovan	32	male	alapakkam	3	no	no	no	no	no	8	106	24	81	6	20	15	92	11	high	no	no	no	no	no	no	yes	yes	no	no
vinayagam	33	male	velachery	1	no	no	no	no	no	3	124	20	85	6	20	10	92	11	high	no	no	no	no	no	no	yes	yes	no	no
kannan	42	male	madipakkam	3	no	no	no	no	no	3	6.3	20	86	4	20	4	96	10	high	no	yes	no	no	no	no	no	yes	no	no
alamelu	54	female	puraisavakkam	4	yes	no	no	no	no	4	49.4	20	83	4	20	8	96	9	high-	no	no	no	no	no	no	yes	yes	no	no
somasundaram	70	male	iyyapanthangal	3	yes	yes	no	no	no	14	10	29	79	6	22	15	92	12	high	no	no	no	no	yes	no	yes	yes	no	no
panneerselvam	63	male	anna nagar	3	no	no	no	no	no	5	12	20	87	3	20	6	95	9	high-	no	yes	no	no	no	no	no	yes	yes	no
banu	62	female	nesapakkam	3	yes	no	no	no	yes	6	63.7	24	87	6	18	6	96	11	high	no	yes	no	no	no	no	no	yes	no	no
prakash	33	male	shenoy nagar	3	no	no	no	no	no	9	63.7	30	80	6	20	10	93	12	high	no	yes	no	no	no	no	no	yes	no	no
selvaraj	26	male	anna nagar	2	no	no	no	no	no	22	112	29	78	6	20	12	94	12	high	no	yes	no	no	no	no	yes	yes	no	no
sundaresan	70	male	pattabiram	3	yes	yes	no	no	no	4	167	25	82	4	20	8	94	10	high	no	yes	no	no	no	no	no	yes	no	no
anusha	46	female	mandaveli	3	yes	no	no	no	no	6	13.2	24	84	6	20	15	92	11	high	no	yes	no	no	no	no	no	yes	no	no
srinivasan	56	male	porur	2	no	no	no	no	no	9	15.7	20	83	4	24	12	92	9	high-	no	yes	no	no	no	no	yes	yes	no	no
dhayalan	49	male	thiruvallur	3	no	no	no	no	no	9	30.1	22	84	6	24	10	92	9	high-	no	yes	no	no	no	no	yes	yes	no	no
gururajan	59	male	arumbakkam	1	no	yes	no	no	no	6	76.7	22	88	5	20	10	92	10	high	no	yes	no	no	no	no	no	yes	no	no
umapathy	80	male	madipakkam	2	no	yes	no	no	no	6	3.2	20	88	2	18	6	94	5	low-	no	yes	no	no	no	no	no	yes	no	no
annadurai	68	male	ayyapakkam	4	yes	no	no	no	yes	4	96.4	24	82	5	20	10	94	11	high	no	yes	no	no	no	no	no	no	no	no
chandrakumar	75	male	chromepet	1	yes	no	no	no	no	2	24	16	89	4	16	2	95	6	low-	no	yes	no	no	no	no	no	yes	no	no
vasantha kumar	38	male	avadi	1	no	yes	no	no	no	2	12.8	18	89	4	18	4	95	6	low-	no	yes	yes	no	no	no	no	no	no	no
sathish kumar	53	male	avadi	2	no	no	no	no	no	3	70	24	88	4	20	12	93	10	high	no	no	no	no	no	no	yes	no	no	no
venu	64	male	mangadu	1	no	yes	no	no	no	23	26.8	18	87	3	18	5	95	10	high	yes	yes	no	no	no	no	no	yes	no	no
gopi	58	male	kamarajar nagar	1	no	no	no	no	no	4	158	20	87	6	18	4	94	10	high	no	yes	no	no	no	no	no	yes	no	no
eswari	80	female	perambur	4	yes	yes	no	no	no	6	146	20	84	6	20	10	93	10	high	no	no	no	no	no	no	yes	no	no	no
chinnathambi	42	male	thiruvallur	2	no	no	no	no	no	6	34.7	24	86	5	22	4	96	11	high	no	no	no	no	no	no	no	yes	no	no
praveen kumar	25	male	nellore	3	no	no	no	no	no	3	3.1	28	84	6	26	6	92	11	high	no	yes	no	no	no	no	no	yes	no	no
suresh	71	male	west mambalam	4	yes	yes	no	no	no	11	100	24	85	6	22	10	94	11	high	no	no	no	no	no	no	yes	yes	no	no
venkatesan	62	male	avadi	4	yes	no	no	yes	no	15	55.7	22	84	5	20	6	95	10	high	no	yes	no	no	no	no	yes	no	no	no
vijayaragavan	84	male	thendral nagar	2	yes	no	no	yes	no	10	74.1	20	88	3	22	4	92	9	high-	no	yes	yes	no	no	no	no	no	no	no
sham rao	49	male	puzhal	4	yes	no	no	no	no	11	113	30	80	6	22	15	92	12	high	no	no	yes	no	no	no	yes	yes	no	no
murali	29	male	mugappair	2	no	no	no	no	no	4	88.4	24	89	3	24	8	92	7	high-	no	yes	no	no	yes	no	yes	yes	no	no
thulasi	51	male	koratur	3	no	no	no	no	no	5	41.8	26	89	3	26	10	92	7	high-	no	yes	no	no	no	no	yes	yes	no	no
kaviyarasan	54	male	GKM colony	3	yes	yes	yes	no	no	30	58.9	22	87	4	20	2	94	9	high-	no	no	yes	yes	no	no	no	no	no	no
babu	73	male	alwarpet	2	no	yes	no	yes	no	10	87	20	88	2	20	4	93	5	low-	no	no	no	no	no	no	yes	yes	no	no
rajendran	65	male	puzhal	2	no	yes	no	yes	no	18	302	30	78	6	24	15	92	12	high	no	yes	no	no	no	no	yes	no	no	no
suguna	26	female	muduchur	1	yes	no	no	no	no	4	101	20	84	6	18	15	92	10	high	no	no	yes	no	no	no	yes	yes	no	no
divyanathan	35	male	velachery	3	no	no	no	no	no	7	287	20	80	6	24	15	92	10	high	no	yes	no	no	no	no	yes	yes	no	no
valliyammal	65	female	george town	2	yes	yes	no	no	no	15	121	18	82	6	20	15	92	10	high	no	yes	no	no	no	no	yes	yes	no	no
yusuf	44	male	chengalpattu	2	yes	no	no	no	no	3	70	24	83	6	24	15	92	11	high	no	yes	no	no	no	no	no	yes	no	no
rahmadullah	35	male	iyyapanthangal	3	no	no	no	no	no	4	22.2	20	85	6	22	12	93	10	high	no	yes	no	no	no	no	yes	yes	no	yes
gopalakrishnan	75	male	kk nagar	1	yes	yes	no	no	no	6	76	26	85	6	24	15	92	11	high	no	yes	no	yes	yes	yes	yes	no	no	no
sasikala	45	female	mgr nagar	2	no	no	no	no	no	7	84	20	86	5	20	12	92	10	high	no	yes	yes	no	no	no	no	yes	no	no
divyasri	58	female	cit nagar	2	no	no	no	no	no	3	69	20	87	6	20	10	94	10	high	no	yes	no	no	no	no	yes	yes	no	no
janaki	50	female	perambur	1	no	no	no	no	no	12	53.4	18	88	5	20	5	96	10	high	no	yes	no	no	no	no	yes	yes	no	no
subramani	75	male	therku mada	1	yes	no	no	no	yes	2	12	20	88	2	20	8	92	5	low-	no	no	no	no	no	no	no	yes	no	no
kusammal	85	female	ekatuthangal	3	yes	yes	no	no	no	4	70	24	86	5	22	4	94	11	high	yes	yes	no	no	no	no	yes	yes	no	no
muthulakshmi	27	male	otteri	4	no	no	no	no	no	4	33.5	20	86	4	28	10	92	10	high	yes	yes	no	no	no	no	yes	yes	no	no

name	age	sex	residence	ct chest grading (grade)	T2DM	SHT	CKD	CAD	OTHERS	NLR	CRP (mg/l)	at admission Respiratory rate (/min)	SPO2 (%)	O2 FLOW RATE (L/min)	AFTER 24 HRS Respiratory rate(/min)	O2 FLOW RATE (L/min)	SPO2 (%)	qCSI score (points)	risk level	headache	fever	myalgia	fatigue	sorethroat	running nose	cough	breathlessness	loose stools	loss of smell/taste
krishnaveni	66	female	thirusoolam	1	yes	yes	no	no	no	3	9.1	28	85	6	24	6	94	11	high	no	yes	no	no	no	no	yes	no	no	no
pitchandi	54	male	t.nagar	3	yes	no	no	no	no	23	53.6	24	86	2	20	4	94	6	low-	no	yes	no	no	no	no	yes	yes	no	no
gopinath	43	male	chengalpattu	4	no	no	no	no	no	13	46	18	89	2	22	4	95	5	low-	no	yes	no	no	no	no	yes	no	no	no
arumugam	67	male	periyamedu	1	yes	yes	no	no	no	10	59.6	30	82	6	24	15	93	12	high	no	yes	no	no	no	no	no	yes	no	no
navaneetham	56	female	manikandan nagar	2	yes	no	no	no	no	2	6.5	20	87	4	20	5	95	9	high-	no	yes	no	no	no	no	no	yes	no	no
palainivel	51	male	t.nagar	2	yes	yes	no	no	no	7	34	20	85	6	22	10	92	10	high	no	no	no	no	no	no	yes	yes	no	no
dhamodharan	55	male	ekatuthangal	3	no	yes	no	no	no	7	130	22	84	5	24	15	92	10	high	no	no	no	no	no	no	yes	yes	no	no
ravi gnanakumar	74	male	ganapathy nagar	1	no	yes	no	no	no	5.6	74.1	18	89	2	20	4	95	2	low	no	yes	yes	no	yes	no	yes	no	no	yes
aasiya	52	female	saidapet	2	no	yes	no	no	no	6	12.4	16	88	2	20	10	92	5	low-	no	yes	yes	no	yes	no	no	yes	no	no
srimathi	50	female	madipakkam	1	yes	yes	no	no	no	6	27.5	20	88	4	20	10	94	9	high-	no	no	yes	no	no	no	no	yes	no	no
sriram	49	male	perambur	3	no	no	no	no	no	10	28.1	20	87	6	18	6	94	10	high	no	yes	no	no	no	no	yes	no	no	no
rajmohan	68	male	kolathur	2	no	no	no	yes	no	10	28.1	20	88	2	24	12	92	5	low-	no	no	yes	no	no	no	no	yes	no	no
indrani	74	female	kolathur	1	yes	no	no	no	no	4	12.4	18	88	4	18	4	95	9	high-	no	yes	yes	no	no	no	no	no	no	no
fathima	35	female	shenoy nagar	2	no	no	no	no	no	4	76	18	88	4	18	10	94	9	high-	no	yes	no	no	no	no	yes	no	no	no
dhan singh	68	male	nandhanam	3	yes	yes	no	no	no	22	67.2	24	86	6	24	15	92	11	high	no	no	no	no	no	no	no	no	no	no
susila devi	67	female	vetrinagar	3	no	no	no	no	no	3	98.8	22	85	6	24	15	93	11	high	no	yes	no	no	no	no	yes	yes	no	no
muniyammal	50	female	saidapet	2	no	no	no	no	no	22	74.5	22	85	6	22	12	94	10	high	no	yes	no	no	no	no	yes	yes	no	no
jamuna bhai	65	female	thirunindravur	2	no	no	no	no	no	2	56	24	84	4	20	12	92	10	high	no	yes	no	no	no	no	yes	no	yes	no
bhakthavachalam	47	male	koratur	1	yes	no	no	no	no	29	95.3	28	80	6	22	10	92	11	high	no	yes	no	no	no	no	no	no	no	yes
jothi ramalingam	67	male	avadi	3	no	yes	no	no	no	13	17.7	26	81	6	24	10	93	11	high	no	yes	no	no	yes	no	yes	yes	no	no
nagaraj	80	male	thiruvallur	3	no	no	no	no	no	11	125	32	82	6	24	10	93	12	high	no	yes	no	no	yes	no	yes	yes	no	no
perumal	46	male	velmurugan nagar	3	no	yes	no	no	no	7	56	26	85	6	24	10	92	11	high	no	yes	no	no	yes	no	no	yes	no	no
syed ibrahim	68	male	alwarpet	2	yes	no	no	yes	no	4	72.2	24	84	4	28	10	93	10	high	no	yes	no	no	no	no	yes	yes	no	no
aadhimoolam	52	male	choolaimedu	3	no	no	no	no	no	7	108	18	89	2	18	6	94	2	low	no	yes	no	no	no	no	no	yes	no	no
saif ali	73	male	peerkaranai	1	no	yes	no	no	no	2	87.9	18	88	4	22	10	93	9	high-	no	yes	no	no	yes	yes	no	yes	no	no
syed karim	60	male	pudhupet	3	no	no	no	no	no	4	69.2	20	89	4	22	4	94	6	low-	no	no	no	no	no	no	no	yes	no	no
alagesan	39	male	anna nagar	1	yes	no	no	no	no	7	72	24	84	6	22	10	92	11	high	yes	yes	yes	yes	no	no	no	yes	no	no
edison	86	male	madipakkam	2	yes	yes	no	no	no	9	113	18	87	6	22	12	92	10	high	no	yes	yes	no	no	no	no	no	no	no
sekar	44	male	saidapet	3	no	yes	no	no	no	5	40.1	18	89	4	16	4	96	6	low-	no	yes	yes	no	no	no	no	no	no	no
kathirvel	59	male	nungambakkam	4	yes	yes	no	no	no	10	117	22	78	6	22	15	92	10	high	no	yes	no	no	no	no	no	yes	no	no
chamdrasekar	60	male	vennampathi	2	no	no	no	no	no	7	112	23	82	6	24	12	92	11	high	no	yes	no	no	yes	yes	yes	yes	no	yes
kameshwara rao	69	male	ayyapakkam	3	no	no	no	no	no	3	59.1	20	86	4	22	15	92	9	high-	no	yes	yes	no	no	no	yes	no	no	no
lawrence	80	male	thirupathur	2	yes	yes	no	yes	no	11	76.6	26	82	6	24	10	92	11	high	no	yes	no	no	no	no	yes	no	no	no
manjula	50	female	maduravoyal	3	no	no	no	no	no	7	35.4	18	87	5	18	10	92	10	high	no	yes	no	no	no	no	no	no	no	yes
tamil selvi	52	female	nungambakkam	4	yes	yes	no	no	no	12	45.7	20	85	6	22	15	92	10	high	no	yes	yes	no	no	no	no	yes	no	no
ramdayal	27	male	t.nagar	3	no	no	no	no	no	4	16.3	22	83	6	22	15	93	10	high	no	yes	no	no	yes	no	yes	no	no	no
ravi	40	male	jothiyammal	2	yes	no	no	no	no	2	27.4	18	89	4	18	4	96	6	low-	no	no	no	no	no	no	no	yes	no	no
bragadheeswaran	34	male	velachery	1	no	no	no	no	no	4	38.2	18	83	6	20	12	92	10	high	no	yes	no	no	no	no	yes	yes	no	no