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# "Covid-19 and Cardio-Vascular Complications"

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**ABSTRACT**:
Currently, the world is facing a pandemic caused by Severe Acute Respiratory Syndrome Coronavirus. The first signs of the new virus began to show up in December 2019 in China. In COVID-19 'CO' stand's for Corona; 'VI' stand's for Virus, 'D' stand's for Disease & 19 as it was discovered in 2019. Hence the name got derived COVID-19.
Researchers in the United States have shown that extracts of an aromatic herb called Artemisia annua inhibit the replication of severe acute respiratory coronavirus (SARS-CoV-2) – the agent responsible for the current Coronavirus Disease 2019 (COVID-19) pandemic. This Disease was referred to as 2019 Novel Coronavirus.
**Keyword's:** Corona Virus, COVID-19, Cardiac Arrest, Cardiovascular Heart Failure (CHF), Acute Heart Failure, Myocardial Injury.

## I. INTRODUCTION:

The coronaviruses are single-stranded RNA viruses, with great capacity for fast mutations and recombination, causing respiratory or intestinal infections in humans and animals. Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.

The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it's important that you also practice respiratory etiquette (for example, by coughing into a flexed elbow; using mask; handkerchief.

The people among those who develop symptoms, most (about 80%) recover from the disease without needing hospital treatment. About 15% become seriously ill and require oxygen and 5% become critically ill and need intensive care. Complications leading to death may include Respiratory failure, Acute Respiratory Distress Syndrome (ARDS), Cardiovascular Compilation's, Sepsis and Septic shock, Thromboembolism, Multi organ failure, including injury of the heart, liver or kidney's People aged 60 years and over, and those with underlying medical problems like high blood pressure, heart and lung problems, diabetes, obesity or cancer, are at higher risk of developing serious illness.

**Content**:

A high prevalence of cardiovascular risk factors including age, male sex, hypertension, diabetes, Tobacco use has been reported in patients with Coronavirus disease 2019 (COVID-19) who experienced adverse outcome. The aim of this study was to investigate the relationship between cardiovascular risk factors and in-hospital mortality in patients with COVID-19. Cardiac injury, defined as Increased Serum Troponin levels, emerged as an independent predictor of mortality in COVID-19, particularly when associated to underlying Cardiovascular Disease. Moreover, traditional cardiovascular risk factors including Age, Hypertension, Diabetes and Smoking; were Frequently reported in critically ill cases and seemed to Affect in-hospital outcome. These conditions are highly prevalent in high-income Asian and Western Countries and represent a matter of concern, especially Considering population growth and ageing.

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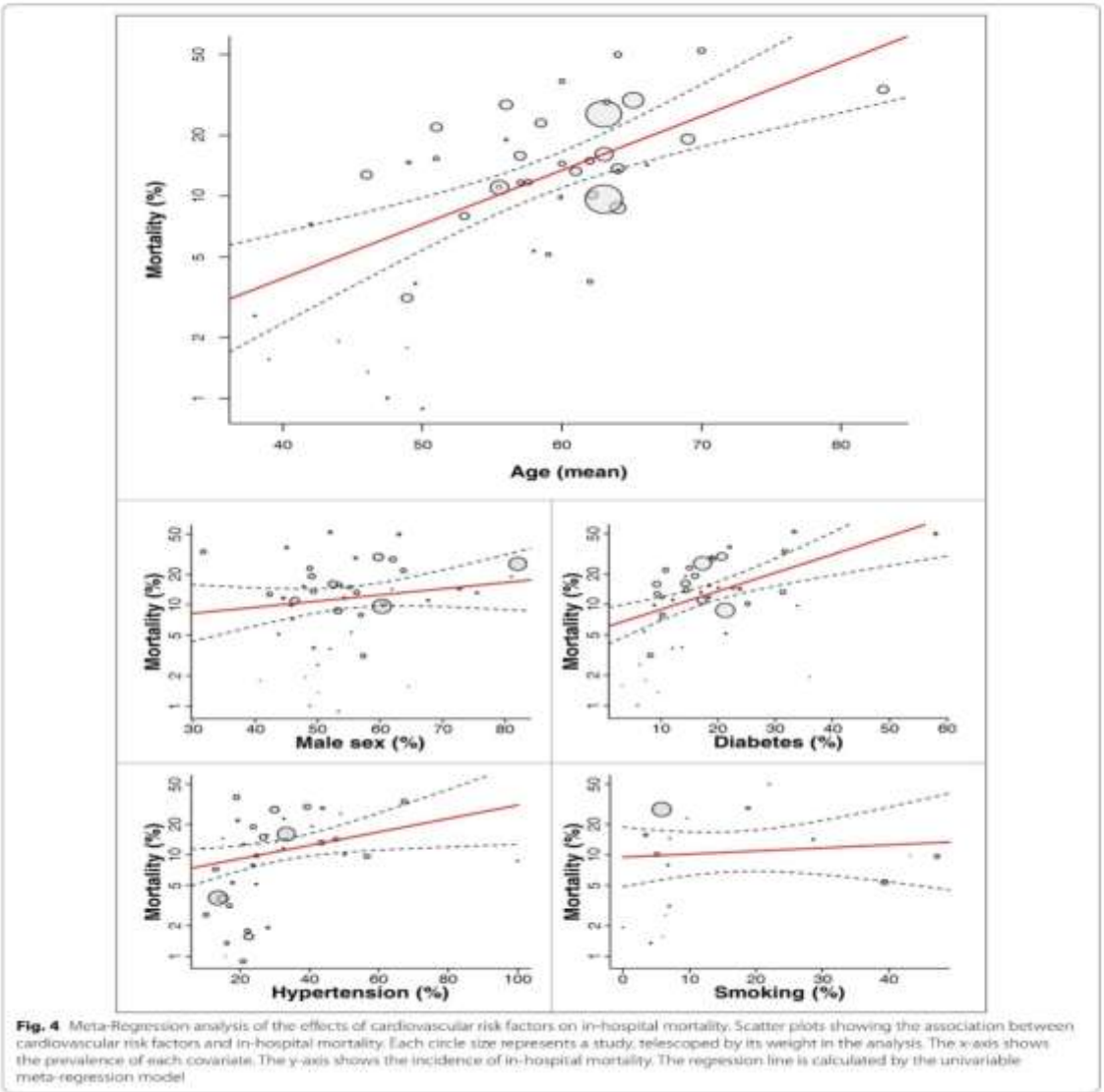


**Fig. 4** Meta-Regression analysis of the effects of cardiovascular risk factors on in-hospital mortality. Scatter plots showing the association between cardiovascular risk factors and in-hospital mortality. Each circle size represents a study, telescoped by its weight in the analysis. The x-axis shows the prevalence of each covariate. The y-axis shows the incidence of in-hospital mortality. The regression line is calculated by the univariable meta-regression model

The current data based on up-to-date evidence suggests that the most common cardiovascular complications of COVID-19 are HF, myocardial injury and cardiac arrhythmias. Though the mechanisms for cardiovascular manifestations of COVID-19 are still yet To be elucidated, the following multiple pathways have been pro-Posed:

i. Direct cardiotoxicity;
ii. Systemic inflammation;
iii. My cordial demand-supply mismatch;
iv. Plaque rupture and Coronary thrombosis;
v. Adverse effects of therapies during Hospital-Isolation;
vi. Sepsis leading to DIC;
vii. Increased systemic Throm-Bogenesis; and
viii. Electrolyte imbalances.

Myocardial injury Is reported to mainly result from direct viral involvement of Diomyocytes and the effects of systemic inflammation. Though venous thromboembolism incidence was based on a single report, Patients with COVID-19 are at increased risk of hypercoagulable states due to prolonged immobilisation, systemic inflammation and Risk. In addition to pre-existing comorbidities including CVD being Associated with worse outcomes in

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patients with COVID-19; Cardiovascular complications such as myocardial injury has also been Shown to be associated with increased risk of severe COVID-19 and fatal outcomes. Myocardial injury is commonly defined as Substantial elevation of high-sensitivity cardiac troponin levels and It has been reported that elevated troponin levels are associated with greater risk of severe disease and mortality. Monitoring of Markers of cardiac damage such as troponin, N-terminal pro B-type Natriuretic peptide and creatine kinase during hospitalisation for COVID-19 could help in the identification of patients with possible Cardiac manifestations, to enable early and more aggressive intervention. Aggregate analysis of the literature suggests that the most frequent cardiovascular complications among patients hospitalised with COVID-19 are HF, myocardial injury, cardiac arrhythmias and ACS. Early identification and monitoring of cardiac complications Could help in the prediction of more favourable outcomes.

The Causes of these cardiovascular manifestations warrant further investigation as more data becomes available. Although many Cardiovascular risk factors have been associated with Adverse outcome, confounding and residual confounding Could lead to apparent associations that might not represent genuine effects or can bias the magnitudes of effects.

Myocardial oxygen supply/demand mismatch; As a result of increased cardio metabolic demand associated with the systemic infection and ongoing hypoxia caused by severe pneumonia or acute respiratory distress syndrome can lead to increased demand in the face of inadequate supply leading to myocardial damage. In the presence of chronic cardiac diseases or cardiac involvement will have a higher mortality rate in comparison to patients without cardiovascular disease. Anaemia, lymphopenia, hypoxemia, abnormal kidney and liver function, elevated creatine kinase and D-dimer, thrombocytopenia, and increased lactate dehydrogenase can be present. Inflammatory markers like serum ferritin and C-reactive protein were elevated. Troponin and brain natriuretic peptide may be elevated in patients with COVID-19 with cardiac involvement and should be obtained in patients with such a suspicion.

All of these points have since been confirmed in American and European case reports:

- Patients with underlying conditions are at higher risk for complications or mortality from COVID-19 and up to 50 percent of hospitalized patients have a chronic medical illness.
- 40 percent of COVID-19 patients have Cardiovascular or Cerebrovascular disease.
- 16.7 percent of patients developed Arrhythmia.
- 7.2 percent developed acute Cardiac injury.
- 8.7 percent of patients developed Shock; 3.6% developed Acute Kidney Injury.
- Rates of complication were universally higher for ICU patients.
- Some COVID-19 patients develop Myocarditis.
- Fatality rates for comorbid patients are higher than the average population.[2]

- Cancer: 5.6%
- Hypertension: 6%
- Chronic respiratory disease: 6.3%
- Diabetes: 7.3%
- Cardiovascular disease: 10.5%

In patients presenting with what appears to be a typical cardiac syndrome, COVID-19 infection should be in the differential during the current pandemic, even in the absence of fever or cough.

**Preventive Measures**:

Basic Preventive Measure From COVID-19 every person must follow are; Clean your hands often. Use soap and water, or an alcohol-based hand rub. Maintain a safe distance from anyone who is coughing or sneezing. Wear a mask when physical distancing is not possible. Don't touch your eyes, nose or mouth. Cover your nose and mouth with your bent elbow or a tissue when you cough or sneeze. Stay home if you feel unwell. If you have a fever, cough and difficulty breathing, seek medical attention.

Patients who do not have any urgent requirements should avoid routine, non- urgent outpatient visits at hospitals or clinics in these challenging times. Heart rate and rhythm and blood pressure may be assessed by patients, if appropriate equipment is available or given to them. Urgent blood checks should be communicated to patients.

Health care professionals and patients should be diligently trained on the appropriate use of wearing personal protective equipment (PPE) during clinic visits to minimize transmission risk. Between each patient visit, rooms and materials should also be properly cleaned to avoid spreading infection to other staff and patients. Regular Blood Pressure (BP) should be checked; Patient should not have Hypertension. There should be Normal Breathing. Regular Heart Function should be

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checked through Electrocardiography (ECG) method.

## II. CONCLUSION:

COVID-19 outbreak has challenged almost all sectors due to the spread of the disease at an alarming rate across the globe. Notably, COVID-19 is an RNA virus that poses a threat to public Health. Currently, the disease has caused thousands of infections and deaths. Ideally, the rapid spread of the ailment calls for strong Investigation and isolation protocols to avert additional spread. Fundamentally, no confirmed medicine or vaccine has been Created to improve the health of patients with the condition. Therefore, individuals need to take measures such as isolation, Proper ventilation, hand hygiene and use of personal protective Equipment, mainly surgical masks, eye protection, gloves, and Gowns to safeguard themselves from the disease. COVID-19 is associated with a number of cardiovascular complications, including myocardial injury and myocarditis, AMI, heart failure, dysrhythmias, and VTE. Some of the medications utilized to treat COVID-19 also have potential cardiac complications. It is important for the emergency clinicians to be aware of these complications when treating the COVID-19 patient.

**Declaration**:

(I) Ethic's Approval & Consent to Participate
(II) Consent for Publication
(III) Availability of Data & Material's
(IV) Competing Interest
(V) Funding

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