

## Study on the Various Diseases Association with Covid-19

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### ABSTRACT

In December 2019, the source of the second severe acute respiratory syndrome coronavirus (SARS-CoV-2) was Wuhan City, Hubei Province, China. The disease caused by the SARS-CoV-2 coronavirus was officially named COVID-19 on February 11, 2020, by the World Health Organization (WHO). COVID-19 typically affects the lungs and causes a variety of symptoms, including fever, dry cough, and fatigue. The general public is at high risk of contracting SARS-CoV-2 because of how easily it can spread. Quick action has been taken by the Chinese government and scientific community to determine the source of the outbreak, communicate the viral gene sequence, and manage the pandemic. To find observational studies on COVID-19 risk estimations, this meta-analysis used PubMed, SciELO, and Web of Science data. Different data formats were utilized in the development of COVID-19 data search and collecting methods, including Emtree, meth words, and free text comprising phrases such as COVID-2019, SARS Cov-2, and MERS Cov-2. Clinical, demographic, medical, and epidemiological features were the primary foci of these approaches. The most susceptible hospital patient populations to contracting COVID-19 were determined by this meta-analysis study, which also detailed methods for preventing this illness. Coronavirus infection disease19 individuals' medication histories and illness risk assessments are the subjects of this meta-analysis.

**Keywords-** COVID-19, Hypertension, Diabetes, Alzheimer disease, WHO.

## I. INTRODUCTION

Wuhan, Hubei, China was the epicentre of the 2019 COVID-19 pandemic, which quickly grew over the world. The infection was eventually named SARS-CoV-2 by the World Health Organization (WHO)[1]. It was recognized as the 2019 novel coronavirus. The fast global spread of COVID-19 prompted the World Health Organization to declare a pandemic on March 11, 2020, and they urged all nations to take preventative measures. According to epidemiological studies, the initial Chinese cases had a connection to the Huanan Seafood Market. SARS-CoV-2 poses a serious threat to public health because of its fast transmission via respiratory droplets and close personal contact [2]. A wide range of symptoms can be experienced by patients infected with COVID-19. These include: high body temperature, difficulty breathing, coughing, headache, myalgias,

diarrhea, fatigue, sore throat, loss of smell, ageusia, chest pain, hemoptysis, rhinorrhea, vomiting, skin rash, reduced awareness, and seizures. As a general rule, people tend to get better on their own[3]. A Chinese study found that compared to people who did not have any prior diseases, the mortality rate was much higher for those who had hypertension, diabetes, chronic obstructive pulmonary disease, cardiovascular disease, or cancer. Injuries to the heart, kidneys, and liver are common outcomes of acute respiratory distress syndrome (ARDS) caused by COVID-19. There isn't a vaccine or definitive treatment available just now because the viral aetiology and proliferation processes are still not fully understood. The rapid expansion of knowledge on this virus necessitates regular education for clinicians [4].

## II. EPIDEMIOLOGY AND PATHOPHYSIOLOGY

Numerous cases were linked to the Huanan wholesale seafood market during the analysis of the earliest transmission patterns of the COVID-19 outbreak in Wuhan [5]. The number of sick people increased due to the virus being passed from person to person through respiratory droplets and contact, as less than 10% of the cases were linked to the market, according to additional investigation. As a result of the dramatic spike in cases in China and subsequent transmission to several other countries, the World Health Organization (WHO) proclaimed COVID-19 a pandemic on March 11, 2020[6]. Even before symptoms show, SARS-CoV-2 can infect people of any age by direct touch or respiratory droplets released when an infected person coughs or sneezes. Aside from the fecal-oral pathway and fomites, there is a small chance that the infection can go vertically from mother to child if it happens during the third trimester of pregnancy [7]. New evidence suggests that symptom-free carriers of COVID-19 can infect others. When discussing COVID-19, "super spreaders" are defined as people who can infect a large number of people in certain settings that allow for the virus to spread widely, such as large gatherings, by producing a large amount of infectious agents over a long period of time, regardless of whether they are symptomatic or not [8]. The COVID-19 incubation period is 3 days on average, according to the literature, but it can range from 2 to 14 days. For SARS-CoV-2, 2-2.5 is the basic reproduction number ( $R_0$ ). The number of confirmed cases of COVID-19 might increase exponentially in a community that is vulnerable since an infected person can spread the virus to 2-2.5 other people [9]. Babies, people over the age of 65, and patients with co-occurring conditions such as diabetes mellitus, high blood pressure, coronary artery disease, and other chronic illnesses have a higher risk of severe instances, while about 80% of patients experience mild to moderate disease severity [10]. The mortality rate from COVID-19 is 2.8% in boys and 1.7% in girls, indicating that the virus is more dangerous in men. Although the respiratory system is most severely affected, the virus can cause harm to other organ systems through direct contact or the host's immune response. Once within a host, SARS-CoV-2 begins to replicate in the nasal and pharyngeal mucosa, then transfers to the lungs, where it continues to replicate and causes a transient viral infection (viraemia)[11]. The virus mostly enters cells through the Angiotensin Converting Enzyme 2 (ACE2) receptor. Many different bodily tissues, including the lining of the airways, the cells that line blood vessels, the kidneys, the heart, and the intestines, contain ACE2. All of these organs could be possible sites of viral replication. The virus generates a powerful inflammatory reaction once it enters cells, leading to the production of many proinflammatory cytokines and

chemokines. It multiplies rapidly and damages epithelial and endothelial cells. In a classic cytokine storm, neutrophil activation and migration are set in motion by proinflammatory cytokines and chemokines[12]. Acute lung injury in COVID-19 is caused by the virus via lowering the immune system's ACE2 function [13]. Inflammation levels rise as ACE2 levels drop because ACE2 regulates the renin-angiotensin system (RAS). Sepsis, multi-organ dysfunction, acute respiratory distress syndrome (ARDS), and a prothrombotic state that exacerbate organ dysfunction are all signs of COVID-19[14].

## III. GENOMIC STRUCTURE OF SARS COV-2

A beta coronavirus, or enclosed, positive-sense, single-stranded RNA virus, is what SARS-CoV-2 is and it is a member of the Coronaviridae family[15]. Although they can infect people, camels, and rabbits, the majority of species that are infected by alpha and beta coronaviruses are bats[16]. People naturally harbor beta-coronaviruses, which can cause severe, frequently fatal respiratory diseases and high fevers. Examples of these viruses are SARS-CoV-1, SARS-CoV-2, and MERS-CoV. Among beta coronaviruses, SARS-CoV-2 showed the highest infectivity but the lowest case fatality rate[17–20]. About 79% of SARS-CoV-2's structure is shared with SARS-CoV-1, and 50% with MERS-CoV. SARS-CoV-2 and two bat-derived SARS-like coronaviruses, SL-CoVZC45 and SL-CoVZXC21, had respective sequence identities of 87.9% and 87.2%. Papain-like protease (PLpro) and 3-chymotrypsin-like protease (3CLpro), often known as protease-Mpro, are the two main structural polyproteins that SARS-CoV-2 encodes[21–23]. The nucleocapsid proteins, matrix, small envelope, and spike surface glycoproteins are essential for the growth, infectiousness, and life cycle of the virus. Antiviral medications may target spike proteins because they activate the host's ACE2 receptor-binding domains. One interesting target for developing novel COVID-19 medications is protease-Mpro[24].

## IV. MATERIALS METHOD

This meta-analysis utilized data from PubMed, SciELO, and Web of Science to identify observational studies on risk assessments of illness in COVID-19. Various search and collection methods were developed for COVID-19 data, utilizing Emtree, MeSH terms, and free text containing specific keywords like COVID-2019, SARS CoV-2, and MERS CoV-2. These methods focused on clinical, medical, demographic, and epidemiological characteristics. This document details the process of selecting and collecting data.

### *Data collection*

The data was collected from electronic medical records and phone calls by a team of clinicians

experienced to handle complex medical issues. It includes demographic information, clinical symptoms, laboratory results, and radiological evaluations. The 2020-2021 data analysis of patients' medical records involved linking the results with participants' personal information through a coding system, following their command and identification method, for examination.

**Methods used for Meta-Analysis tools-**

**PubMed data-based**

PubMed is a free search tool primarily used to access references and abstracts on issues related to medical research, life science, pharmaceutical science, and biomedical studies based on Medline data. The National Library of Medicine in the United States manages this material using the Entrez information retrieval systems. PubMed data-based tools were introduced in 1996, enabling free, private medical searches from home and business. In 1997, the PubMed data-based tools became accessible to the public at no cost.

**Cochrane Library**

The Cochrane Library is a data-driven tool that allows free searching and gathering of information related to medical research, pharmaceutical sciences, biomedical science, and life science. The Cochrane Library is a collection of systematic reviews, meta-analyses, and various other forms of Cochrane reviews. An outcome of pharmacological and medical study.

**SciELO data-based tools**

SciELO is a shorthand for Scientific Electronic Library Online. SciELO Data Based is a platform that utilizes bibliographic data to support digital libraries and electronic publishing of journals. SciELO data was developed to enhance the visibility and accessibility of scientific literature. The SciELO data was submitted through the portal and supplies the SciELO data-based network site. SciELO collections restrict search data by individual nation collections, subject areas, and journal titles.

**Data analysis**

The inclusion criteria, diagnostic criteria, source, and method of selection data were utilized to pick the included data. Collecting and analyzing data on laboratory-confirmed COVID-19 infections in conjunction with other disorders. It established the disease risk evaluations on the severity of COVID-19. Assessed the severity of COVID-19 patients categorized as severe and non-severe, both in the context of coronavirus infection and other conditions, including those in intensive care units (ICU) and non-ICU settings, and examined the progression and stabilization of patients with coronavirus infection. 19 patients with various preexisting conditions are being assessed for their chance of contracting coronavirus, including those with hypertension, cardiovascular disease, asthma, chronic kidney disease, and coronary heart disease, both in severe and non-severe cases. We are conducting a meta-analysis by examining a range of sources such as

peer-reviewed journal articles, conference proceedings, books, monographs, and other scholarly publications. The data has been collected based on the severity and death rates of people with hypertension, diabetes, coronary heart disease, and asthma.

**V. RESULTS AND DISCUSSION**

**Total patients involved in this study**

The number of patients with various diseases who have coronavirus infection disease (covid-19).

S.NO	Covid-19 patients with other Disease	Number of Patients
1	Hypertension disorder	21 patients
2	Diabetes (Non –Insulin type2)	18 patients
3	Diabetes (Insulin-dependent-type1)	Six patients
4	Kidney Disease (Blood Dialysis)	Three patients
5	Asthmatic Disease	Eight patients
6	Cardiovascular Disease (Heart disease)	Two patients
7	Low blood pressure	Two patients
8	Alzheimer Disease	One patient
9	Hyperplasia disease	One patient

**Medication use in treatment-**

Medicine use in the treatments of corona infection disease-19.

S.NO	Medication Name	Dose Quantity(Mg)
1	Paracetamol	500mg
2	Ivermectin	200mg
3	Azithromycin	100mg
4	Doxycycline	100mg
5	Zinc tablet	50mg
6	Vitamin C	500mg
7	Vitamin D3	60K(IU)

Evaluating disease risk and medication history in COVID-19 patients. This is a survey-based meta-analysis study that includes individuals from the Kumaon area of Uttarakhand who have additional illnesses in addition to COVID-19. The study included 62 patients with confirmed COVID-19 who also had comorbidities such as diabetes (Type 2 non-insulin dependent and Type 1 insulin-dependent), hypertension, cardiovascular disease, kidney disease (patients undergoing blood dialysis), etc.

**Diabetes Mellitus:** Analysis of the history of disease risk evaluations for severity. There were 18 individuals with Type 2 diabetes and 6 patients with Type 1 diabetes involved in this study.

- Diabetes (Non insulin dependent Type-2) patients- 18
- Diabetes ( Insulin dependents Type-1 ) patients- 6
- Preventable or manageable status – manageable disease.
- Severity- mild
- Mortality- Nil
- Disease Risk assessment- Type2- 29%
- Disease risk assessment- Type1- 10%

**Hypertension disorder** – The severity analysis included 21 COVID-19 patients with verified hypertension and two patients with low blood pressure.

- Hypertension patients with confirmed corona disease- 21
- Low blood pressure with corona infection disease patients – 2
- Preventable or manageable status- manageable Disease.
- Severity – mild
- Mortality – Nil
- Disease Risk assessment- 34%

**Asthmatic Disease-** it involves eight corona infection disease patients with confirmed asthma disorder.

- Asthma disease with confirmed corona disease- 8
- Preventable or manageable status- manageable Disease.
- Severity- Moderate
- Mortality- Nil
- Disease risk assessment- 13%

**Kidney disease-** this severity analysis, three corona patients with confirmed kidney disease (Blood Dialysis Patients) were involved in the study.

- Blood dialysis kidney disease patients- 3
- Preventable or manageable status – manageable Disease

- Severity- Moderate
- Mortality- Nil
- Disease Risk assessment- 5%

**Cardiovascular Disease-** involves two patients with corona infection disease with confirmed heart disease (cardiovascular Disease).

- Cardiovascular disease patients – 2
- Preventable or manageable status- manageable Disease
- Severity- moderate Disease
- Mortality- nil
- Disease risk assessment-3%

**Alzheimer disease-** this analysis of severity only corona infections disease 2019 patients with confirming Alzheimer disease.

- Alzheimer disease with confirmed corona disease- 1
- Preventable or manageable status- manageable Disease.
- Severity- moderate Disease
- Mortality- Nil
- Disease risk Assessment- 1%

**Hyperplasia disease-** this meta-analysis of severity, one corona infection disease19 patients with confirmed hyperplasia disease were involved in this study.

- Hyperplasia disease patients- 1
- Preventable or manageable status – manageable Disease.
- Severity- moderate
- Mortality- Nil.
- Disease risk assessment-2%

**Medication History in Coronavirus infection disease 19 with confirm other condition**

Medication use in treatments of corona infection disease19 patients with confirm other Disease in this meta-analysis study-

S.NO	Disease in Covid19 patients	Medication use in the treatment	Medicine Brand Name
1	<b>Hypertension</b>	Tablet Telmisartan	Telma 20
		Tablet Amlodipine 5 mg	Amidine-5
2	<b>Hyperplasia</b>	Tablet. Alfuzosin	Alfonso-10
		T. Midodrine hydrochloride	LUTRON
3	<b>Low Blood pressure</b>	T. Metformin +Glimepiride	Experiment GM502
		Tablet. Glimepiride	GM502
5	<b>Diabetes (Type1)</b>	Inj. Insulin	Humulin. R
		T. Salbutamol+Theophylin	Theo.Asthalin
6	<b>Asthmatic Disease</b>	Salbutamol inhalation	Asthalin
		Blood Dialysis	
7	<b>Kidney disease(Blood dialysis patients)</b>	Inj. Erythropoietin	Renocrit(IU)
		Ayurvedic medication	
8	<b>Cardiovascular Disease ( Heart disease)</b>	Tablet. Moxonidine	Moxocard

9	Alzheimer disease	T. Donepezil Hydrochloride	Concept-10
		Syrup Mentat	Mentat-DS

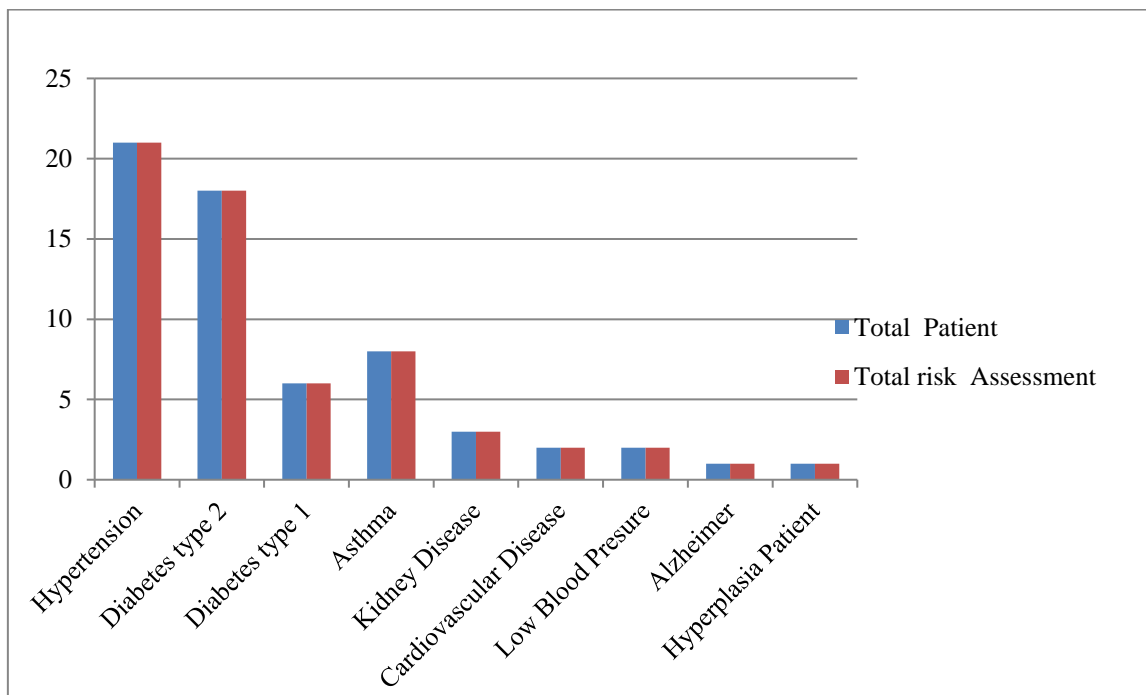


Fig 1: Chart-Total COVID-19 confirms patients in this study

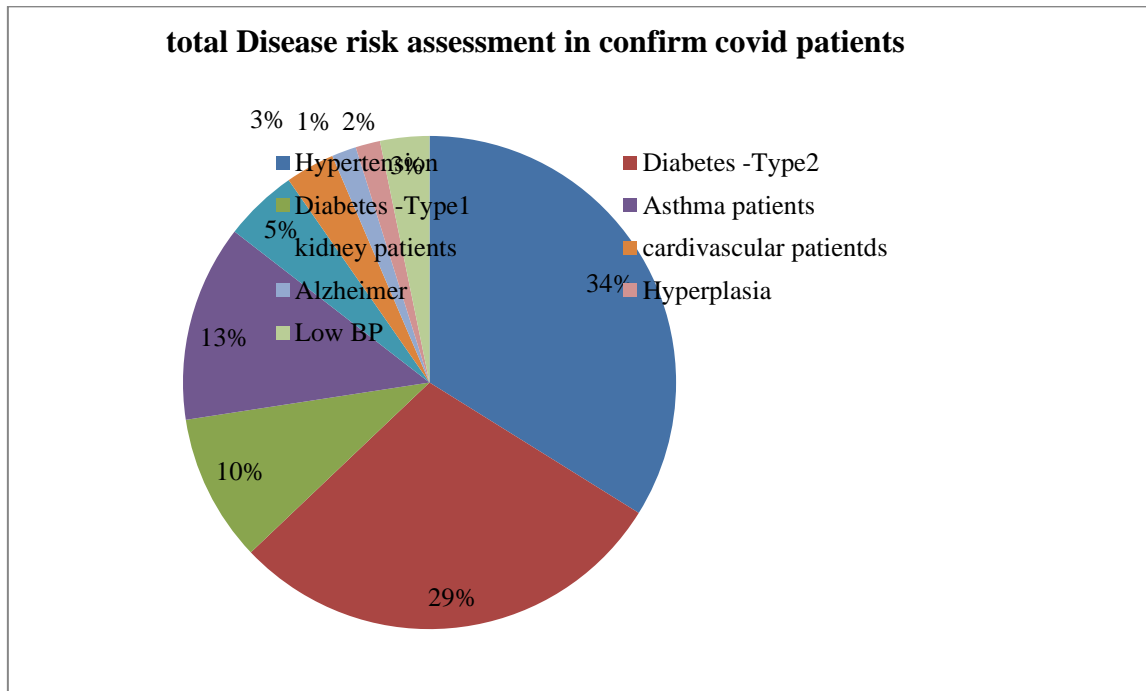


Fig 2: Chart- Total Disease risk assessment in confirming covid19 patients

**Disease risk assessments Questionnaire**

**A) Patients History- Quantitative data on health risk factors-**

1. Patient Name – Kumwar pal Singh
2. Date of birth- 30 July 1964
3. Family history of Disease- NO

4. Local/Campus address- 762 house number, Awas Vikash kashipur Uttarakhand
5. Job occupation- Assistant manager HR Pvt.Lt kashipur
6. Phone number- 9411945211
7. Email address- NIL

**B) Medication History – Some other disease before being corona –**

1. You had some other disease before being corona - **Diabetes disease.**
2. How long have you been suffering from this Disease-**suffering from 3 year**
3. What is the list of medicines you are taking, including dosage-

S.NO	Medication Name	Brand Name	Time	Dose
1	Tablet.Metformin + Glimepiride	ExermentGM502	OD	Single

4. what was the time gap between the medicine you were already taking and the medicine related to coronavirus disease? Are there any side effects after taking both together- **30 min gap between diabetic medicine and covid19 medicine.**

**C) Corona History – Description of therapy and medicine brought in corona disease treatment.**

1. When did you first get diagnosed with corona. Date- **26 April 2021**
2. When did your corona therapy start, and how long did it last- **26 April 2021- 4 May 2021**
3. Under which Doctor did treatment take place which hospital/ corona center- **Govt. hospital kashipur Uttarakhand.**
4. How affected were you by corona, was your oxygen level low? Were you admitted to the ICU.- **Low Oxygen level and admitted to ICU in 3 days.**
5. What did the Doctor advise you about your health during the treatment of corona infection disease – **Normal advice and following diet chart**
6. Details list of medication and dosage of medicine used in your corona treatment –

S.NO	Medication Name	Brand Name	Time	Dose
1	Paracetamol 650mg	Lenol650	BD	Single 650mg
2	Cap.Doxycycline 100mg	Generic	BD	100mg
3	Tab. Zinc 50mg	Generic	BD	50mg
4	Tab. Azithromycin 500mg	Zithrox+	OD	500mg
5	Tab.VitD3/ multibit.	Nurokind gold	OD	IU

7. What was the date of your total recovery from corona – **4 May 2021**
8. Did you face any problems after recovery from the corona. Did you come across side effects from the use of medicines used in corona

treatment – **yes, sugar level increased, and hypertension level increased.**

Name and Signature of the interviewer- **Jay Prakash**

Date and time – **15 August 2021**

**Discussion**

This meta-analysis study utilized surveys to identify the patients most vulnerable to COVID-19 and determine strategies for their protection. This meta-analysis study is based on surveys conducted in hospitals. This study is a meta-analysis focusing on illness risk assessments and medication history in patients with coronavirus infection disease19. We examined 62 patients who had various illnesses along with a coronavirus infection. We examined 21 cases of hypertension, 2 cases of hypotension, 18 cases of non-insulin-dependent type 2 diabetes, 6 cases of insulin-dependent type 1 diabetes, 8 cases of asthma, 3 cases of kidney disease requiring blood dialysis, 2 cases of cardiovascular disease, 1 case of Alzheimer's disease, and 1 case of hyperplasia. We observed a maximum of 21 people with hypertension. This work aims to manage disease risk in the future and avoid infectious diseases such as coronavirus infection. They are capable of conducting danger, impacts, and disease risk evaluations.

**VI. CONCLUSION**

Disease risk assessments are a method that connects medical research to decision-making. Risk assessments can be described similarly to the human health and disease risk assessments outlined in the 1983 government study by NRC. The study disclosed the illness risk assessments among COVID-19 participants. Further research is needed to identify the risk factors affecting the patients. Disease risk assessments are essential for managing disease risk factors. Disease risk evaluations consider the necessity of properly managing the risk under future conditions.

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