

# Risk Factor Profile of Patients Infected with COVID-19: An Observational Study

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## Abstract

**Background:** Coronavirus (CoV) infection has become a pandemic worldwide for February 2020. The infection rate has been increasing in India also which prompted the Government to implement countrywide lockdown.

**Aims and Objectives:** The main objective of our study is to evaluate risk factors predisposing the patients to COVID-19 infection.

**Methods:** This is a single center prospective observational study done during April and May 2020, where we have collected all demographic details of total 59 COVID-19 patients admitted to the intensive care unit or general ward in our institute. We have evaluated the detailed history of these patients for risk factors such as age, gender, smoking, alcohol exposure, diabetes mellitus, hypertension, and cardiovascular disease and studied their association with COVID-19.

**Results:** In our study, we have found the mean age of presentation to be 51 years and males with 64.4% are more infected than females. Diabetics with 32% is the most common risk factor followed by hypertension with 20.3%. Alcohol is next only to hypertension with 12% and smoking comprising 10% of the population studied.

**Conclusion:** Elderly male population, diabetes, and hypertension pose a greater risk for CoV severe acute respiratory syndrome coronavirus 2 infection in our population.

**Key words:** COVID-19, Diabetes, Old age, Pandemic, Risk factors

## INTRODUCTION

A new zoonotic strain of coronavirus (CoV) has entered into human life from Wuhan city of China for December 2019.<sup>[1]</sup> It is one of the most fatal diseases with significant secondary infection rate, which the world has experienced in the past century. The disease caused by this new strain was named COVID-19 and declared a pandemic by the WHO on March 11, 2020.<sup>[2]</sup> COVID-19 has been affecting human beings all over the world, mostly affecting countries such as Italy, Spain, and the United States with maximum infectivity rate and fatality.

In India, 1<sup>st</sup> COVID-19 case was detected on January 31, 2020, and incidence has been increasing then-on. As infection is quite new to the world, the pattern of infectivity and risk factors are yet to be proven. By the end of May, total number of COVID cases has reached 191,000 in India with a mortality rate of around 0.02% per lakh population, whereas worldwide, it is 4.1% per lakh population as per the WHO update on infection rate. Age and comorbid factors are considered as main risk factors for infection and deaths of COVID-19 patients. Several studies published till now have suggested a variety of risk factors for COVID-19. Our aim is to study and evaluate the prevalence of risk factors in patients with COVID-19 in our region.

## RESEARCH DESIGN AND POPULATION

We have conducted a single centered, observational prospective study. Our hospital is a designated COVID-19 center and all the COVID-19 positive patients were

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admitted and given preliminary treatment. All the patients were diagnosed with COVID-19 using real-time (RT) PCR technique as per the WHO guidelines.

**Inclusion Criteria**

In our study, we enrolled all the patients who were tested positive with RT PCR for COVID-19.

Laboratory confirmation of COVID-19 is done by RT PCR technique using two genes, i.e., RDRP gene and E gene. All the patients who developed symptoms such as sore throat, fever, shortness of breath, and generalized weakness (malaise) are screened for COVID-19. Moreover, people who came in contact with COVID-19 positive patients were also screened. People who had international travel history before 14 days were also screened. We have enrolled all the patients who were tested positive for COVID-19 during the period from April 1, 2020, to May 15, 2020, in our study.

**Data Collection**

All the patients were admitted and the clinical history and demographic details were recorded. History includes information on smoking, alcohol intake, and comorbid conditions such as diabetes mellitus, hypertension, coronary artery disease, cerebrovascular disease, and chronic pulmonary disease. All the patients were evaluated and monitored for symptoms such as sore throat, fever, shortness of breath, and generalized weakness (malaise), vomiting, nausea, diarrhea, and headache. Laboratory investigations were sent for complete blood picture, liver function test, renal functions test, random blood sugar, HbA1c, lipid profile, BT, CT, PT, APTT, ECG, and chest X-ray which were also done, but our study is limited to risk factor evaluation. Data are analyzed using 2013 Microsoft Office Excel software.

**RESULTS**

Our study involved 59 patients with median age 51 years with minimum of 9 years and maximum of 59 years. Of them 38 were male and 21 were female accounting to 64.4% and 35.6%, respectively, as depicted in Table 1.

The common risk factors documented were diabetes with 32% accounting to 18 patients. The next most common risk factor was found to be hypertension in 12 patients, i.e., 20.3%. followed by alcohol intake in 12% of patients accounting for seven patients. Six patients nearly 10%

**Table 1: Sex distribution in COVID-19 patients**

Sex	No. of patients	Percentage
Males	38	64.4
Females	21	35.6

had smoking as risk factor, cardiovascular disorders, and chronic respiratory diseases constituting <3% accounting to two patients in each category. All the above risk factors are depicted in Table 2 below.

**DISCUSSION**

CoV is a family of six strains with an envelope surrounding a non-segmented single-stranded RNA. A new seventh strain was identified in Wuhan in December 2019 causing pneumonia in most of the affected individuals and named that it as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It is shown to be acting on ACE2 receptors in lung epithelium and causing respiratory epithelium damage and manifestations.<sup>[5]</sup> As it is a viral infection, it is postulated that infectivity rate is more in individuals, where immunity is compromised and a certain group of people who are highly exposed to it like health-care professionals.

In our study, we have illustrated that the risk of infection is more in the elderly population with the median age of 51 years. This study is similar to a recent study published in China by Yongli Yan *et al.*<sup>[4]</sup> The study also demonstrated that men are more affected than women with 64.4 % in male sex when compared with 35.6 % in the female sex. Yongli Yan *et al.* also published a similar trend in their study.

Huang *et al.* showed high prevalence of diabetes mellitus in their study with 20% in adults.<sup>[5]</sup> In our study, we have observed 32% of COVID-19 patients were diagnosed with diabetes, this suggests that patients with diabetes mellitus were more prone to develop COVID-19. The mechanism of increased susceptibility of diabetes should be studied. Next common risk factor associated with COVID-19 is hypertension with 20% which correlated to study published Shi *et al.*<sup>[6]</sup> Huang *et al.* showed that 15% of patients had hypertension in their study, whereas our study demonstrated prevalence of 20.32% in our study.<sup>[7]</sup>

Smokers in Huang *et al.*, comprised <1% but Shi *et al.*, quoted in their study that 8% of the patients were smokers.

**Table 2: Various risk factors prevalent in COVID-19 patients**

Risk factor	No. of patients	Percentage
Diabetes	18	32
Hypertension	12	20.3
Alcohol	7	12
Smoking	6	10
Respiratory disease	2	3
Cardiovascular disease	2	3

In our study, smokers were 10% which demonstrated smoking to be a significant risk factor in our population. Our study showed that 12% of patients had a history of alcohol intake. About 14.5% of cardiovascular disease are a risk factor in a study published by Wang *et al.*, whereas our study had around 3% which shows that infection rates are not common in cardiac patients in our population. Our study had 3% of patients with a respiratory disease which is associated with COVID-19, whereas Wang *et al.*, study had respiratory disease in 2% of population.<sup>[7]</sup>

## CONCLUSION

SARS-CoV-2 is a new strain of virus from corona family is most common among diabetics and hypertensive population. Age alcohol and smoking emerged as the next common risk factors for COVID-19 in our study.

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