Study the Risk Factors Influencing Covid-19 Infection in Humans

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Abstract

The corona virus pandemic has affected the population worldwide leading to SARS-COV-2 virus, traumatic impacts on health systems, public health, societies and individuals globally. To control the spread of covid-19 government imposed national lockdowns, travel restrictions and instructed social distancing along with the use of facemasks and sanitizers in many countries. As a result of this, many researchers are opting for digital data collection methods rather than manual way of collection. Data collection via phone, emails, and various other digital platforms were being preferred. This study will help to understand that how covid infection affects the various human body systems including the age, occupation, gender, blood groups and co-morbidities. It will also help to analyze between the patient affectivity rate (more positivity rate in 1st wave or 2nd wave), role of vaccination and its effectivity.

Keywords: SARS-COV-2, Masks, Digital platforms, Blood group

Importance

This study will help in creating awareness regarding covid 19 infection, its variation and effect on the population. It will also help to analyze the various precautionary measures taken by the government in order to control the spread of the infection to lesser number of people. The study will help in ruling out the effect of covid infection in patients with comorbidities such as diabetes. Also the age groups that are more prone to covid infection can be detected along with the types of blood group. This strategical analysis will help the health care professionals to treat the patients accordingly and effectively as per the symptoms.

Introduction

Human corona virus (HCoV) which causes gastrointestinal and respiratory tract infections, were first introduced by the discovery of HCoV-229E and HCoV-OC43, from the nasal cavities of human patients having symptom like common cold in 1960's [3,4]. Other discovered human corona viruses, which have caused serious respiratory tract infections, include SARS-CoV (in 2003), HCoV NL63 (in 2004), HKU1 (in 2005), MERS-CoV (in 2012), and the latest one SARS-CoV-2 (in 2019) resulting in coronavirus disease (COVID-19) [5,6]. Some countries are developing biological weapons. The first story which emerged about outbreak of corona is related to the laboratory named Wuhan Institute of Virology (WIV), located in the Chinese city where the first COVID-19 cases were reported. Many researchers believe that the spread of the virus was most probably by the natural means (animal source). Covid -19 was not found in India initially, when it was spreading in very large amount in other countries. The First

case of COVID-19 infection in India was reported in Kerala, on January 27, 2020. A 20 yr old female presented to the Emergency Department in General Hospital, Thrissur, Kerala, with a history of dry cough and sore throat for one-day. She disclosed that she had travelled to Kerala from Wuhan city, China, on January 23, 2020 owing to COVID-19 outbreak situation there. She was asymptomatic between January 23 -26. On the morning of 27th she had a mild sore throat and dry cough. She did not give a history of contact with a person suspected or confirmed with COVID-19 infection, however, she gave a history of travel from Wuhan to Kunming by train, where she noticed people with respiratory symptoms on railway station and also in train. On March 11, 2020 the World Health Organization (WHO) has declared the novel corona virus (COVID-19) as outbreak of global pandemic [2]. In India the first case was reported in January 2020 from Kerala. The number of corona virus infected people in India crossed 200, after a spike in cases over the past six days. The central and state governments have decided to completely shutdown 75 districts across the country where corona virus cases have been reported. Major train services are also suspended till further notice, exempting goods trains. All metro rails services are also suspended. At present it is extended till 3rd May 2020. In this study, we tried to collect data by online method from Palus and nearby villages.

Methodology

The challenges to collect data from remote areas include qualitative research, to obtain a sampling frame quantitative research and contacting difficult to reach crowd of people). For qualitative research, sampling approaches include various types like purposive sampling, snowball and convenience sampling. These sampling methods can also be used for online surveys shared via email or social media platforms (Roy *et al.*, 2020). In countries where usage of mobile phone is in large population, a sampling frame of the general population can be obtained by contacting mobile phone network operators. Alternatively, random digit dialing could be used to generate a study sample. These methods, however, have limitations. In this study we collected data by online method in Palus and surrounding villages.
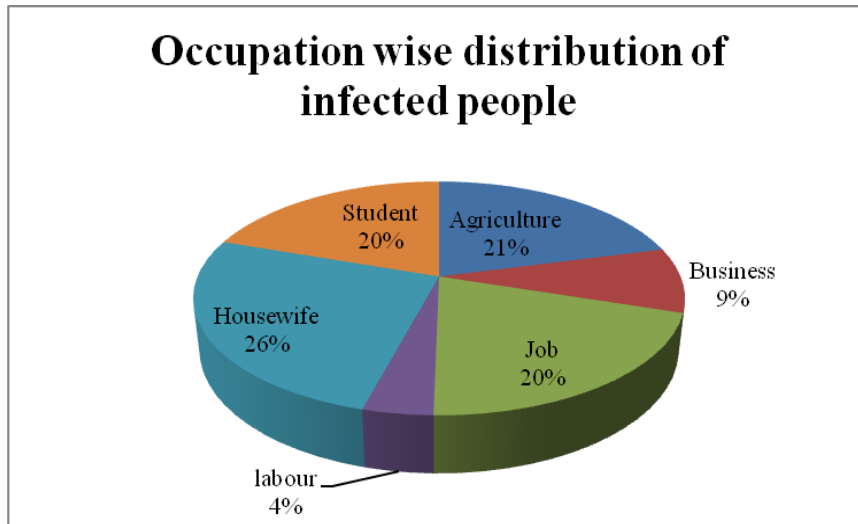
Result and Discussions
Covid data 2021 – Analysis
1) **Gender wise risk for infection of COVID -19**
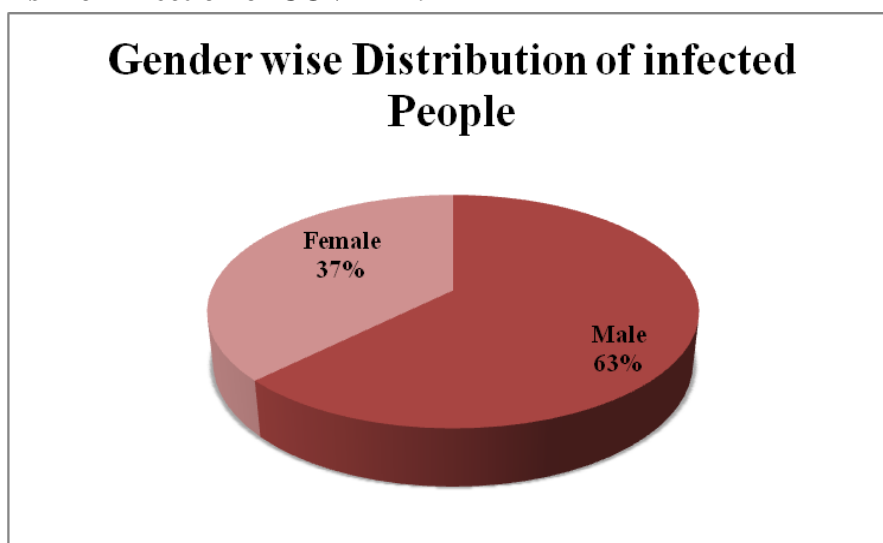
From the above pie chart, we can see that 63% males are infected. Therefore, we can conclude that Males are more prone to infection.

2) Occupation wise risk for infection of COVID-19

From the above pie chart, it seems that percentage of housewives (26%) being infected is more as compared to other occupations. In other occupations, mostly males are involved. Since males are at high risk of being infected, the occupations where mostly males are working are at more risk of infection.
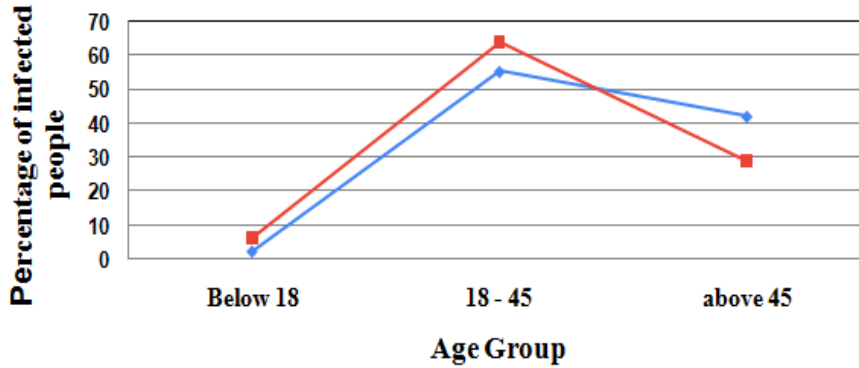
3) Age wise risk for infection of COVID -19
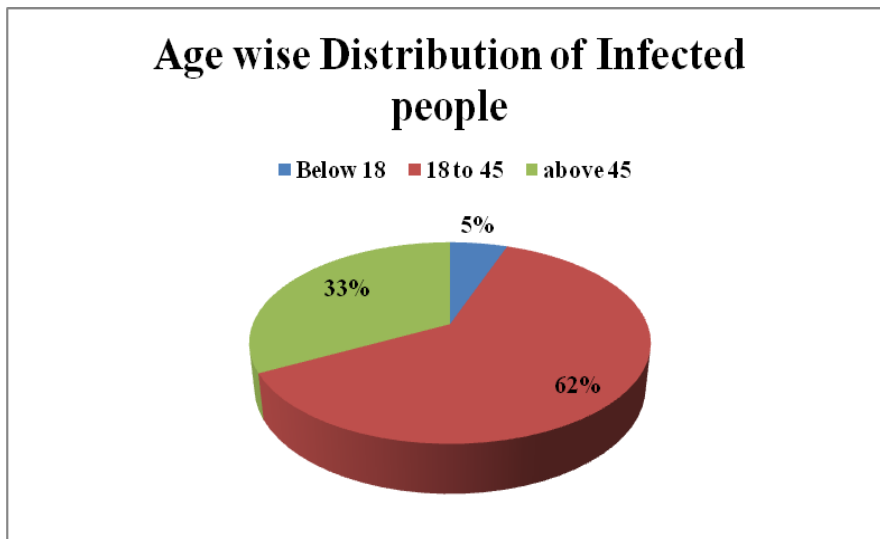
From bar diagram and pie chart we can see that the people in the age group of 18 to 45(62%) years are more infected. We can conclude that the age group of 18-45 years is more prone to infection.
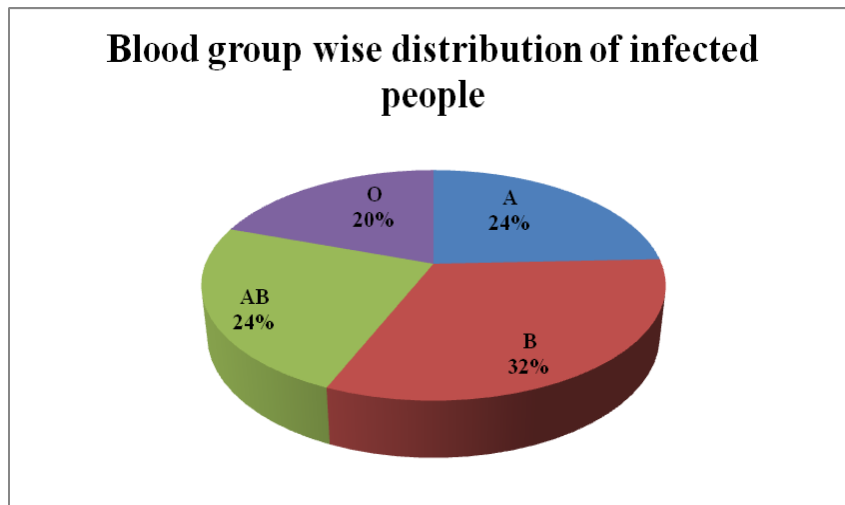
4) Age group wise comparison of infected people in wave 1 and Wave 2

Percentage of infected people in the age group of 18 to 45 years is more among all the other age groups in Wave 1 as well as Wave 2. But percentage of infected people in the age group "above 45" is reduced in Wave 2 as compared with Wave 1.

5) Blood Group wise risk for infection of COVID-19

From above pie chart we can say that each blood group is at equal risk of infection of COVID-19. To get strong evidence for our conclusion given above we test the hypothesis "Each blood group has equal chance of being infected". For this we fit the discrete uniform distribution for the frequency distribution of blood groups. Also we state the following hypothesis:

Null Hypothesis (H$_0$): "Each blood group is at equal risk or each blood group has equal chance of being infected" i.e. Uniform distribution fits well to our frequency distribution of blood groups.

<div align="center">V/s</div>

Alternative Hypothesis (H$_1$): "Each blood group has different chance of being infected or Risk is not equal for every blood group"

To test above hypothesis, we use Chi-square test of goodness of fit at 1% level of significance as follows

Blood Group	Observed number of infected patients (Oi)	Probability	Expected number of infected patients (Ei)	$\frac{(Oi - Ei)^2}{Ei}$
A	73	0.25	75	0.053333333
B	96	0.25	75	5.88
AB	72	0.25	75	0.12
O	59	0.25	75	3.413333333
Total	300	1	300	9.466666667

Chi- Square (χ^2) Statistics is calculated $\chi^2 = \sum \frac{(Oi - Ei)^2}{Ei}$
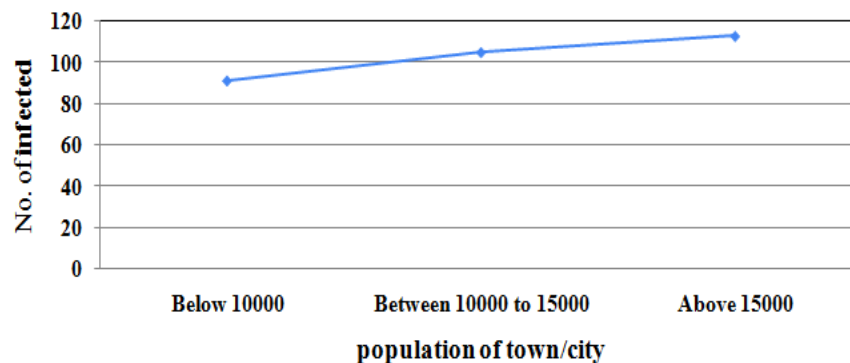
Calculated $\chi^2 = 9.467$

Table value of χ^2 with 3 degrees of freedom at 1% level of significance is 11.3448

Therefore, here Calculated χ^2 is less than table value of χ^2

So we accept the Null Hypothesis (H_0) and conclude that "Each blood group is at equal risk."

## 6) Risk in Town/City having different Population

Distribution of infected people according to population of Town/City

 From above diagram we can say that risk of infection is more in the Town/City having more population i.e. risk of infection increases as per the population of town/city.
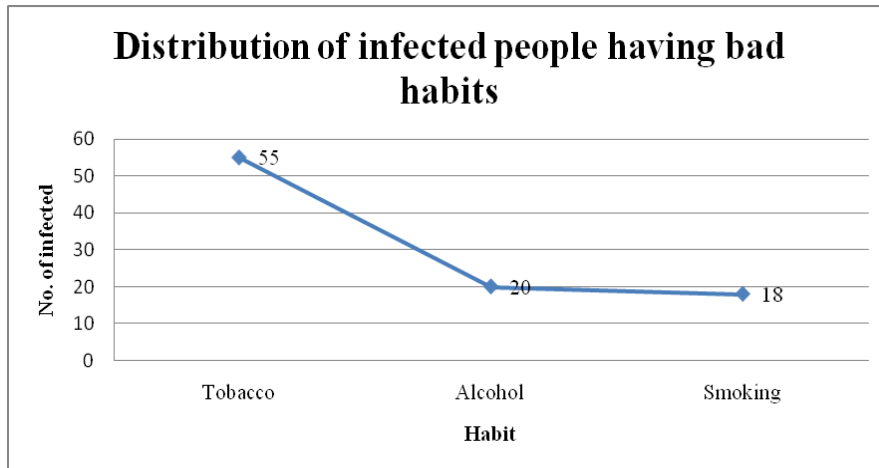
7) Health problem wise risk for infection of COVID-19

**Distribution of infected people having health problems**
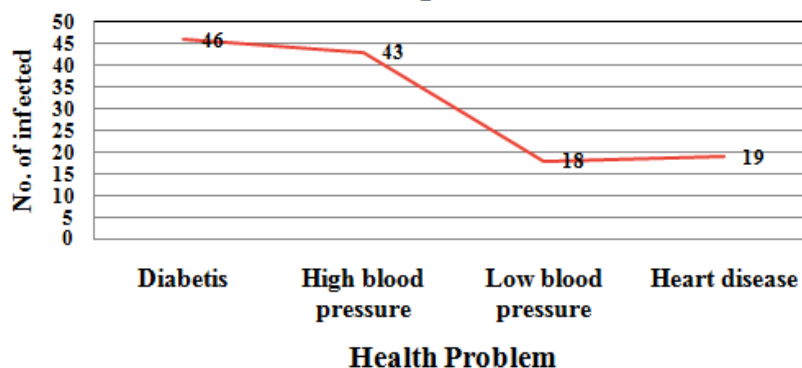
Among all other health problems, patients having Diabetes are more prone to the risk of infection for COVID-19.

8) Addiction wise Risk for infection of COVID-19:

From above diagram we can see that the tobacco addicted people have more risk of infection as compared to other addictions.

9) Risk for infection of Mucor Mycosis after COVID-19 infection:
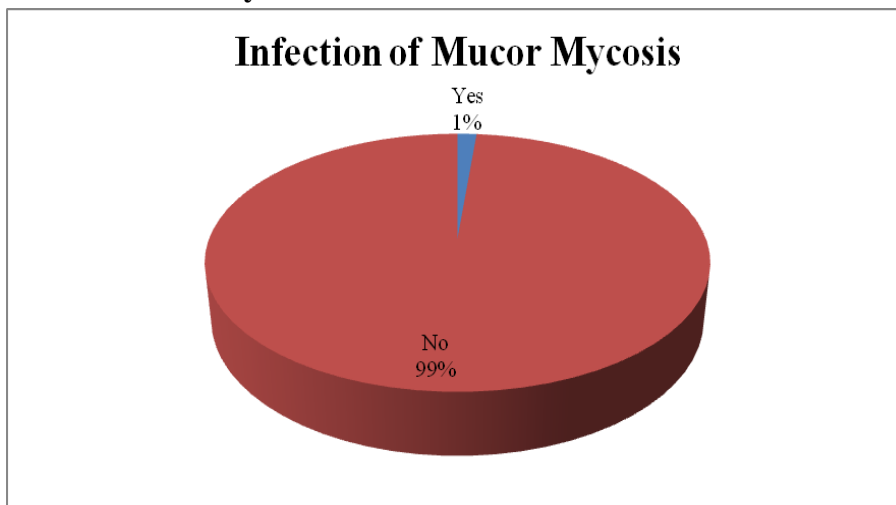
From above pie chart we can see that only 1% people are infected by Mucor Mycosis COVID-19 infection. i.e. very few people have a risk of infection of Mucor Mycosis.

Conclusion

Covid 19 pandemic worldwide has affected the population. Various researchers are studying its variations and mutations happening in it, which is making it difficult to treat it with effective vaccination. Various precautionary measures including social distancing, national lockdowns and travel restrictions are imposed so as to control its spread. This study was done in order to find out and analyze various factors that impact the severity of covid infection. Gender wise study showed that majority of the males (63%) are prone to get infected whereas occupation wise, housewives (26%) seemed to be more susceptible to the infection. Age wise study done concluded, that the people from 18-45 years age group (62%) were more at the risk of infection during Wave 1 whereas in wave 2 people above age of 45

years had less chances of getting infected. In this study it was found that each blood group is at nearly equal risk of infection of COVID-19. Population wise town/cities were more at the risk of infection due to overcrowding. Co-morbidities are one the major risk factors involved with covid infections. Diabetic patients have much risk of infection as compared to others. Tobacco addiction was also one of the major factor associated with the COVID-19 infection. Since COVID-19 infection weakens the immune system, so there are chances of the infected people to suffer from Mucor Mycosis, especially those with diabetes. But as per the study done, it was found that only 1% infected people had the chances of getting mucor mycosis which is very very less comparatively. Overall this study will help to understand the necessary and concerned causes of COVID-19 infections and how we can take precautionary measures in order to remain safe and less susceptible to the infection.

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