

ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 13, Issue, 08 (A), pp. 2024-2027, August, 2022

**International Journal of
Recent Scientific
Research**

DOI: 10.24327/IJRSR

Research Article

A RETROSPECTIVE STUDY ON EVALUATION OF RESISTANCE AND RECOVERY IN COVID PATIENTS with respect to AGE, GENDER, COMORBIDITIES AND ABO BLOOD GROUPS

*Sadanandam Akari, Tulasi Gorantla, Rashmitha Reddy Kallam, Javali Ganta and Veena Nethi

Department of Pharmacy Practice, Malla Reddy Institute of Pharmaceutical Sciences, JNTUH University

DOI: <http://dx.doi.org/10.24327/ijrsr.2022.1308.0424>

ARTICLE INFO

Article History:

Received 13th May, 2022
Received in revised form 11th
June, 2022
Accepted 8th July, 2022
Published online 28th August, 2022

Keywords:

Coronavirus disease-2019 (COVID-19), severe acute respiratory syndrome (SARS), Age, Gender, Comorbidities, ABO blood group.

ABSTRACT

Research findings have indicated that the percentage of patients who succumbed to COVID-19 was higher in those with pre-existing medical conditions than the patients without medical conditions. In gender-based evaluation, the percentage of positive cases in male and female were found to be 52.67% and 47.33% respectively. In age-based evaluation, the percentage of different age groups were found to be 18-25 (8.67%), 25-35 (16%), 35-45 (18%), 45-55 (26%), 55-65 (31.33%). Percentage of CKD (4.6%), Diabetes (8.6%), Hypertension (6%), pulmonary diseases (5.3%) were observed. ABO blood group population distribution was analyzed to be Type A (49.9%), Type B (26.19%), Type O (9.52%), Type AB (14.2 %) of frequencies were observed in severe covid patients. In Non severe covid patients Type A (29.6%), Type B (26.8%), Type O (11.1%), Type AB (32.40%) percentages had been observed in our project. The results of this study states that age between 55-65 group was vulnerable towards covid. When it comes to gender comparison, males are more prone when compared to female patients. Of all the diverse co-morbid conditions few were taken into consideration of which chronic kidney disease, hypertension, diabetes, and pulmonary diseases are analyzed and found that the severity of disease was more in patients with comorbid conditions. The final outcomes of blood groups states that Type A Blood group has less resistance when compared to B> O>AB.

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INTRODUCTION

The '2019-nCoV' or '2019 novel coronavirus' or 'COVID-19' is a newly discovered communicable disease spread by SARS-CoV-2. The individuals infected with COVID-19 will encounter mild to moderate symptoms and redeem without requiring any remission. The evaluated incubation period was found to be two to eleven days in some cases and last for around fourteen days. The common symptoms include fever, body pains, loss of taste and smell, respiratory illness such as cold, cough, breathing difficulties. If the progression of disease is high, medical attention maybe required. Progression of disease is mainly seen in geriatrics and people with comorbid conditions like cardiorespiratory diseases, immunological disorders, or cancer.

Evaluating Covid with the Help of Age, Gender, Medical Comorbidities And Abo Blood Groups

Age

Individuals of all age has same impact of risk for infection or severity of the disease. But few research mentioned that there's a higher impact of risk or severity found in geriatrics, that is,

greater than 60 years this is due to immunosenescence. As the age increases the immune system in the geriatrics start to dysfunction (Varnica N. G *et al*, 2021).

Gender

A meta-analysis suggests that male patients are at risk of developing severe illness and increased mortality compared to that of female patients (Jian-Min Jinet *al*, 2021). The following are the possible mechanisms

Addition To ACE-2 Receptors

The entry or invasion of SARS-CoV-2 to the ciliated secretory cells in the nasal epithelium is through ACE-2 receptors. The ACE-2 receptors are surplus in men compared to that of females.

Comprehending the Testoster one and Oestrogen link

Female are considered to have powerful immune resilience and response. The female hormone Oestrogen stimulates the immune response quickly and represses its action. Whereas the male hormone, Testosterone interfere with the body's immune

*Corresponding author: **Sadanandam Akari**

Department of Pharmacy Practice, Malla Reddy Institute of Pharmaceutical Sciences, JNTUH University

response, therefore making men more inclined to acute disease. This scenario is found in other diseases as well.

The hereditary predilection

The third potential cause is the genes which are responsible for recognising a pathogen in the body are on the X chromosome. Since females have two X chromosomes, they are more inclined to have a better immune response and offer better protection.

Comorbidities

Patients with comorbid conditions like hypertension, immunosuppressant disorders, chronic kidney failure, pulmonary diseases have a higher risk of developing infection. The patients having a pre-existing condition and get hospitalized have a higher chance of mortality (Adekunle S *et al*, 2020).

ABO Blood Groups

Understanding the association between the blood type and covid infection could be useful to predict the outcomes (Rashmi Rana, V. *Ret al*, 2021) and establish safety measures to cease the spread of disease. There are several mechanisms explain this theory of which three are considered as major possibility (Christopher Aet *al*, 2020):

ABO antigens as receptors for SARS-CoV-2 cell entry

The virus entry into the host cells occurs through interaction with ACE-2. Sometimes virus may also enter with the help of molecules such as blood group antigens, which may prove the association between blood groups and COVID. A latest study revealed that when SARS-CoV-2 comes in contact ABO antigens on respiratory epithelial cells, the RBD was found to be a magnificent source for A compared to that of B and H antigens. This proves that ABO plays a major role in SARS-CoV-2 entry.

Antibodies against ABO antigens and neutralization of SARS-CoV-2 particles

Interaction of SARS-CoV-2 spike protein to ACE-2 could be obstructed by natural anti-A antibodies. Thus, one may suppose that blood group O and B has less susceptibility for disease. On examination, the hypothesis was proved wrong as phenotype B didn't change the chance of occurrence of infection and found that immunoglobulin isotypes play a major role, so blood group O anti-A has significantly less susceptibility of infection than that of blood group B anti-A.

ABO blood group phenotypes and SARS-CoV-2 progression

Bottom levels of von Willebrand and VIII factors in phenotype O is an explanation for decreased risk of cardiovascular disease and the levels of ACE, reduce conversion of angiotensin-1 to angiotensin-2. Angiotensin-2 is responsible for inflammatory response and induce bp. ACE-2 plays a vital role for the entry of virus which may also be a reason for less susceptibility of disease in blood group O.

METHODOLOGY

This was an observational study which included 150 subjects from a tertiary care hospital.

- **Inclusion criteria:** Covid positive patients, Age above 18 years, Patients with comorbid conditions i.e.,

Hypertension, Chronic kidney disease, Diabetes, Pulmonary diseases.

- **Exclusion criteria:** Covid negative patients, Age below 18 years, Pregnant and lactating women.

Study Method

This study will emphasize certain type of blood group which impact an individual's sensitivity to SARS-CoV-2 infection and evaluating the outcomes. Epidemiological evaluation of covid patients can be observed. Categorical variables will represent as frequencies and percentages. The statistical significance will be difference in the outcome variables between the groups.

The purpose of the research is to observe the resistance and recovery rates based on blood groups, and evaluation factors such as age, gender, and comorbid conditions in covid patients to improve patient conditions.

Patients who are at high-risk can be identified, helps to provide precautions, and improve the quality of life. Susceptibility based on age, gender, and comorbidities can be known and accordingly protective measures can be taken which leads to better patient care. Knowledge on impact of comorbidities (hypertension, diabetes, chronic kidney failure, pulmonary diseases) on covid positive patients can be considered to detect the progression of disease.

RESULT

Gender based

We had observed 79 male patients and 71 female patients out of the 150 patients that were selected throughout the study period with respect to inclusion and exclusion criteria. The below table represents the number of female and male COVID patients enrolled in the study.

Table 1 The table below depicts the frequencies and percentage of male and female patients suffering with covid-19.

Gender	Frequency	Percentage
Male	79	52.67
Female	71	47.33

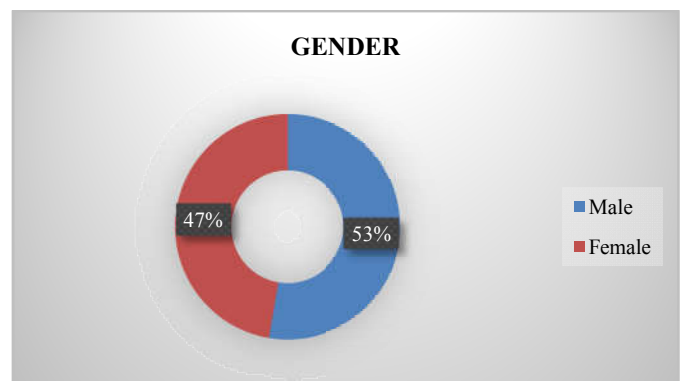


Figure 1 Pie chart representation of gender-based distribution in covid patients

Age based

We had observed that the patients between ages 45 and 65 are more vulnerable to COVID-19.

Table 2 The table below depicts the frequencies and percentage of different age groups patients suffering with covid-19

Number of Cases Identified in Age Groups	Frequency	Percentage
18-25	13	8.67
25-35	24	16
35-45	27	18
45-55	39	26
55-65	47	31.33

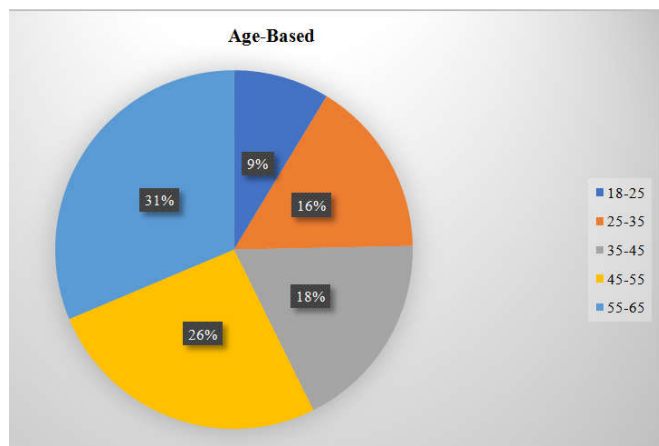


Figure 2 Pie chart representation of age-based distribution in covid patients.

Comorbid conditions

Patients with underlying medical comorbidities like CKD, Diabetes, Hypertension and Pulmonary conditions have increased risk of developing severe Covid-19 infection. The percentage of patients who succumbed to the illness was higher in those with pre-existing medical conditions than that of the people without them.

Table 3 The table below depicts the frequencies and percentage of comorbid patients suffering with covid-19.

Comorbid Conditions	Frequency	Percentage
CKD	7	4.67
Diabetes	13	8.67
Hypertension	9	6
Pulmonary conditions	8	5.33

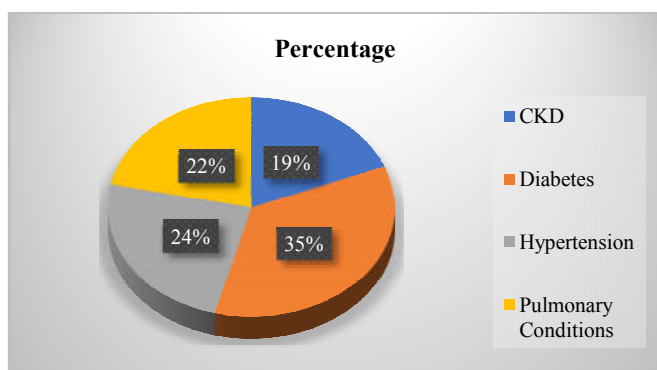


Figure 3 Pie chart representation of age-based distribution in covid patients

ABO Blood group distribution

The research manifests that patients with Type-A are less resistant to the disease. It is also found that the patients with Type-A are more prone to have severe covid-19 infection.

Table 4 The table below depicts the ABO blood group frequencies and percentage of patients suffering with covid-19.

	Gender	A	B	O	AB	
Patients (150 patients)	Total	21	11	4	6	
	Severe (N=42)	M	12	4	3	3
	F	9	7	1	3	
	Total	32	29	12	25	
Non-severe(N=108)	M	18	15	5	19	
	F	14	14	7	16	

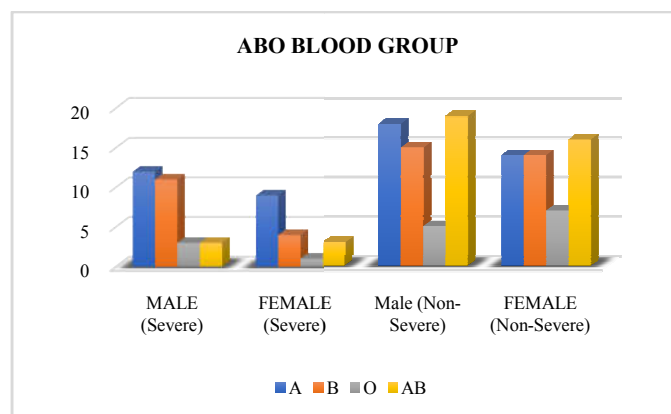


Figure 4 Pie chart representation of age-based distribution in covid patients

DISCUSSION

An outbreak of corona virus from China has created a chaos which strained the healthcare in many ways. At some point it was difficult to categorize which population was at immense risk towards SARS-COV-2 infection.

This is an epidemiological study which is carried out in a retrospective method to know which population of people are more vulnerable to the covid 19 infection with respect to ABO blood groups.

The categorization of population was based on the blood group of the patient who has been attacked by the covid 19. The information according to the study was gained from the Medical Record Department (MRD) and Community, through patient profile forms in a retrospective methodology.

A total of 150 cases were collected all together, of which 79 were male and 71 were females. The subjects were considered according to the inclusion and exclusion criteria starting with initial details of the subjects like blood group, age, comorbid conditions, and details of vaccination.

The evaluation of the case subjects was done according to the age, comorbid conditions, and gender. The distribution of the age group 55-65 was more vulnerable to covid infection. Whereas the analysis based on the gender was observed as

male patients were more vulnerable when compared to the female patients. In general patients with pre-existing medical conditions were under more risk when compared to the patients without medical conditions. According to the cases collected, 42 cases were identified to be severe, of which, 37 patients are suffering from underlying cause. Hypertension, Diabetes, pulmonary diseases, chronic kidney disease, were taken into consideration for co-morbid conditions in our study project of which the values go as follows, Diabetes (8.6%), chronic kidney disease (4.6%), pulmonary disease (5.3%), Hypertension (6%).

Blood groups are resistant against disease naturally over a selected period. The phenotypes in different populations have been observed to be a part for epidemics study. The research manifests that patients with Type-A are less resistant to the disease. It is also found that the patients with Type-A are more prone to have severe covid-19 infection. An outbreak has led to an immense confusion about which population is at more risk, and precautions to be followed to increase the quality of life. So, we came up with this project to provide the epidemiological study which provides immense knowledge to community.

CONCLUSION

The research manifests the vulnerable population which helps to provide a better patient care. According to the study, age group 55-65 are more prone to covid that that of 18-25. When it comes to gender comparison males are more prone when compared to female patients. Of all the diverse co-morbid conditions few were taken into consideration of which chronic kidney disease, hypertension, diabetes, and pulmonary diseases are analyzed and found that the severity of disease was more in patients with comorbid conditions. The final outcomes of blood groups states that Type A Blood group has less resistance when compared to B> O>AB. Finally, the research describes that age, gender, comorbidities, and blood groups play a major role in association with covid. This helps to identify the most vulnerable population, provide a better patient care, and improve the quality of life.

Acknowledgement

We express our gratefulness to Dr. SADANANDAM AKARI and to staff and all doctors of Malla Reddy Multi-specialty Hospital for being cooperative throughout the study. We also thank all the patients who participated in the study.

Conflict of Interest: No conflict of interest.

References

1. Adekunle Sanyaolu, C. O. (2020, June 25). PMC. Retrieved from Comorbidity and its Impact on Patients with COVID-19.
2. Mayo Clinic Staff. (2022, March 1). Retrieved from Mayo Clinic
3. Christopher A. Latz, C. D. (2020, July 12). PMC. Retrieved from Blood type and outcomes in patients with COVID-19.
4. Clinic, C. (n.d.). Coronavirus, Covid-19. Cleveland Clinic.
5. İhsan Solmaz, S. A. (2020, December 9). Wiley Online Library. Retrieved from ABO blood groups in COVID-19 patients; Cross-sectional study.
6. Irena Voinsky, G. B. (2020, May 16). PMC. Retrieved from Effects of age and sex on recovery from COVID-19: Analysis of 5769 Israeli patients.
7. Jian-Min Jin, P. B.-F.-M.-K. (2020, April 29). PMC. Retrieved from Gender Differences in Patients With COVID-19: Focus on Severity and Mortality.
8. Preidt, R. (2020, October 14). Blood Type May Predict Your Risk For Severe COVID. Retrieved from WebMD.
9. Raez Mahmud, M. A. (2021, April 7). Association of ABO blood groups with presentation and outcomes of confirmed SARS CoV-2 infection: A prospective study in the largest COVID-19 dedicated hospital in Bangladesh. Retrieved from Plos One.
10. Rashmi Rana, V. R. (2021, November 2). Association of ABO and Rh Blood Group in Susceptibility, Severity, and Mortality of Coronavirus Disease 2019: A Hospital-Based Study From Delhi, India. Retrieved from Frontiers.
11. Various Medical Schools. (2021, May 14). PMC. Retrieved from The relationship between blood groups and risk of infection with SARS-CoV-2 or development of severe outcomes: A review.
12. Varnica Bajaj, N. G. (2021, January 12). Frontiers. Retrieved from Aging, Immunity, and COVID-19: How Age Influences the Host Immune Response to Coronavirus Infections.

How to cite this article:

Sadanandam Akari *et al.* 2022, A Retrospective Study on Evaluation of Resistance And Recovery In Covid Patients With Respect To Age, Gender, Comorbidities and Abo Blood Groups. *Int J Recent Sci Res.* 13(08), pp. 2024-2027.
DOI: <http://dx.doi.org/10.24327/ijrsr.2022.1308.0424>
