

# Frequency of Co-Morbidities in Patients with COVID-19

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## ABSTRACT

**Background:** This very contagious virus and the pandemic that resulted from its effects on human health resulted in major disruptions and has virtually interrupted every aspect of daily human life including transportation, business, education, and health care delivery worldwide. Patients of COVID-19 having various co-morbidities have worse outcomes when compared with patients without any co-morbidities. Patients with COVID-19 having history of diabetes mellitus, cardiovascular disease, obesity, hypertension and chronic lung disorders have poor prognosis and often lead to worsening outcomes like Pneumonia & ARDS. Old patients, patients with chronic kidney disease and patients with various cancers are not only at risk for acquiring COVID-19, but there are increased chances of mortality among these patients. **Objective:** The objective of our study was to determine frequency of co-morbidities in patients with COVID-19 Pneumonia. **Study Design:** Retrospective Cross-sectional Analytical study. **Settings:** Isolation Wards/HDU of Allied Hospital, Faisalabad Pakistan. **Duration:** Six Months from April 16, 2021 to October 15, 2021. **Methods:** 100 Patients diagnosed with COVID-19 according to definition and inclusion criteria were included in the study. Following demographic features of the patients admitted in Isolation wards/ HDU's of Allied Hospital were collected: age; sex; clinical presentation; smoking history; duration between onset of disease and presentation to hospital; history of co-morbid factors like hypertension, diabetes mellitus Obesity, Cardiovascular Disease, Malignancy, history of intake of Immunosuppressive agents. Mean  $\pm$  SD was calculated for the age of the patients, oxygen saturation of patients and lung involvement of patients. Frequency and percentages were calculated for the Co-Morbidities for COVID-19 pneumonia, gender of the patients, symptoms of patients. Comparative analysis of lung involvement with co-morbidities of patients was done with p value of  $\leq 0.05$  being considered significant. **Results:** Our study included 100 patients. 52 patients (52%) were males while 48 (48%) were females. Mean Age of patients was  $54.91 \pm 15.56$  and mean oxygen saturation was  $90.88 \pm 5.8$ . Mean lung involvement of patients with COVID-19 was  $30.82 \pm 16.27$ . Fever was the commonest symptom amongst the patients included in the study (40%), followed by cough (33%) and shortness of breath (29%). Amongst the co-morbidities in patients with COVID-19, diabetes was found in 54% of the patients, followed by hypertension 34% and ischemic heart disease 6%. **Conclusion:** Our study concludes that individuals having underlying chronic diseases are more prone to contract COVID-19 virus and eventually develop more severe disease as compared to normal healthy persons. Thus, vaccination of this segment of society and early identification of disease among these people can help reduce morbidity and mortality.

**Keywords:** Co-Morbidities, COVID-19, Diabetes, Hypertension.

## INTRODUCTION

By the end of 2019, the novel coronavirus which is commonly now known as severe acute respiratory

syndrome coronavirus 2 (SARS-CoV-2) and COVID-19 emerged worldwide. The impact on human health, impact on daily life, its infectivity, severity of the symptoms of the disease which COVID-19 led to was

unheard of. This very contagious virus and the pandemic that resulted from its effects on human health resulted in major disruptions and has virtually interrupted every aspect of daily human life including transportation, business, education, and health care delivery worldwide. Millions of the general population worldwide has been affected by COVID-19, many hundred thousand of them have encountered critical illness, and sadly tens of thousands have lost their lives. Health delivery systems, Health professionals worldwide have faced challenges like never before in the recent past.<sup>1</sup>

The clinical picture of COVID-19 ranges from minor, self-controlling respiratory tract disease to severe pneumonia leading to Adult Respiratory Distress Syndrome (ARDS), multiorgan dysfunction, and death.<sup>2,3</sup>

Patients of COVID-19 having various co-morbidities have worse outcomes when compared with patients without any co-morbidities. Patients with COVID-19 having history of diabetes, cardiovascular disease, obesity, hypertension and chronic lung disorders have poor prognosis and often lead to worsening outcomes like Pneumonia & ARDS. Old patients, patients with chronic kidney disease and patients having various cancers not only have risk for acquiring COVID-19, but there are increased chances of mortality among these patients.<sup>4,5</sup> In a study by Gaun *et al*, it was concluded that 25.1% of the patients had at least one co-morbidity, (8.2%) patients had two or more co-morbidities. The commonest co-morbidity was detected hypertension (16.9%), and it was followed by diabetes (8.2%).<sup>5</sup>

The rationale of our study is to identify co-morbidities in patients presenting with COVID-19 pneumonia presenting in Allied Hospital Faisalabad. This will not only help in rapid detection of patients who have increase chances of developing critical disease due to COVID-19 because of their co-morbidities. The objective of our study was to determine frequency of co-morbidities in patients with COVID-19 Pneumonia.

## METHODS

It was a retrospective cross-sectional analytical study which was conducted in Isolation wards/HDU Allied Hospital, Faisalabad for a period of 06 Months from April 16, 2021 to October 15, 2021. Non-probability consecutive sampling was the sampling technique. 100 Patients with following inclusion criteria were included in this study:

- i. Adult population age  $\geq$  18 years.
- ii. Both genders, male and female.
- iii. All the patients who fulfilled the criteria for diagnosis of COVID-19 infection, which is given below:

- a) Clinical features that include fever along with pulmonary symptoms (chest pain, tightness, cough and shortness of breath.
- b) Radiological features of ground-glass opacities (GGOs), consolidation either on X-ray chest or HRCT Chest.
- c) Real-time fluorescent PCR of respiratory samples (Oropharyngeal or Nasal Secretion and Tracheal secretions) which turn out to be positive for coronavirus nucleic acid (SARS-CoV-2)

Patients who have negative result of PCR for COVID-19, patients who are suspected of having bacterial pneumonia (that is confirmed on the basis of culture of sputum for bacterial organisms) were excluded from our study.

Severity of Covid-19 was classified as:-

**Mild:** Patients with general symptoms of upper airway infection including, malaise, cough, rhinorrhea, low grade fever with or without sore throat, but no signs and symptoms of pneumonia as accessed by an unbiased consultant physician.

**Moderate:** Patients with general symptoms of upper airway infection including, malaise, cough, rhinorrhea, low grade fever with shortness of breath (SOB) with respiratory rate of more than 25 per min, high grade fever, as accessed by an unbiased consultant physician and features of pneumonia on chest radiograph as reported by a consultant radiologist.

**Severe:** Patients with history of general symptoms of upper airway infection including, malaise, cough, rhinorrhea, low grade fever with excessive shortness of breath (SOB) and respiratory rate of more than 30 per min as accessed by an unbiased consultant physician with SpO<sub>2</sub> of  $\leq$  90%, PaO<sub>2</sub> / FiO<sub>2</sub> of less than 300 and involvement of more than 50% of the lungs with pneumonia on chest radiograph as reported by a consultant radiologist.

**Critically Ill:** Patients meeting the criteria of severe COVID as mentioned above along with respiratory failure and acute respiratory distress syndrome (ARDS) and are in need of ventilator support.

After approval from Hospital Ethical Review Committee, the following demographic features of the patients admitted in Isolation wards/ HDU's of Allied Hospital were collected: age; sex; clinical presentation; smoking history; duration between onset of disease and presentation to hospital; history of co-morbid factors like hypertension, diabetes mellitus Obesity, Cardiovascular Disease, Malignancy, history of intake of Immunosuppressive agents. COVID-19 will be diagnosed

based on history, history of contact, clinical examination, and laboratory investigations including RNA PCR for COVID-19. COVID-19 Pneumonia was diagnosed on the basis of development of respiratory symptoms, signs with radiological findings of peripheral bilateral ground glass opacities, pleural thickening and consolidation, crazy-paving pattern on HRCT Chest. History of Smoking, Diabetes Mellitus, Hypertension, Previous or present lung pathology, Late Presentation (more than 5 days after the development of symptoms, patients having history of being on any Immunosuppressive Medications, Chronic liver disease (child Class B & C) due to Hepatitis B & C, Ischemic Heart Disease & Congestive Heart Failure, Malignancy, history of intake of Immunosuppressive agents, are identified as co-morbidities in patients with COVID-19.

The data was analyzed with the help of SPSS version 12.0 statistical software. Mean  $\pm$  SD was calculated for the age of the patients, oxygen saturation of patients and lung involvement of patients. Frequency and percentages were calculated for the Co-Morbidities for COVID-19 pneumonia, gender of the patients, symptoms of patients. Comparative analysis of lung involvement with co-morbidities of patients was done with p value of  $\leq 0.05$  being considered significant.

## RESULTS

Our study included a total of 100 patients. 48 patients (48%) were females 52 patients while (52%) were males. All patients were admitted in Isolation wards / High Dependency Units. All patients required oxygen support.

Mean Age of patients was  $54.91 \pm 15.56$  and Mean Oxygen Saturation was  $90.88 \pm 5.8$ . Mean Lung Involvement of patients with COVID-19 was  $30.82 \pm 16.27$ . Table 1

**Table 1: Descriptive statistics of patients with COVID-19**

Variable	Mean	Minimum	Maximum	Standard Deviation
Age (years)	54.91	21	87	15.56
SaO2 (%)	90.88	66	98	5.8
Lung Involvement (%)	30.82	5	90	16.27

Fever was the commonest symptom amongst the patients included in the study (40%), followed by cough (33%) and shortness of breath (29%). Table 2

**Table 2: Descriptive analysis of symptoms of COVID-19 patients**

Variable	Frequency (n)	Percentage (%)
Fever	40	40%
Cough	33	33%
Shortness of breath	29	29%
Myalgia	11	11%
Sore throat	04	04%
Body ache	04	04%
Loose stool	02	02%
Runny nose	01	01%

Amongst the Co-morbidities in patients with COVID-19, Diabetes was found in 54% of the patients, followed by hypertension 34% and ischemic heart disease 6%. Table 3

**Table 3: Frequency of co-morbidities in patients with COVID-19 pneumonia**

Variable	Frequency (n)	Percentage (%)
Hypertension	34	34%
Diabetes	58	58%
Cardiovascular diseases	06	06%
Chronic kidney diseases	02	02%
Tuberculosis	01	01%
Asthma	01	1%
OSA	01	1%

**Table 4: Comparative analysis of lung involvement with various co-morbidities like hypertension and diabetes**

Lung Involvement	Hypertension	0.652
	Diabetes	0.617
	CVD	0.935
	CKD	0.960
	TB	0.773

*P value was calculated using Pearson Square test, keeping 95% CL*

## DISCUSSION

The purpose of conducting this important study was to determine the frequency of accompanying comorbidities in patients who developed disease caused by COVID-19 virus. In our study the commonest comorbidity was diabetes which was followed by hypertension (Table 3). This finding in our study is supported by different studies conducted worldwide. In a study by Norouzi M *et al*, the authors concluded that type 2 diabetes mellitus (T2DM) is a very important risk factor for progression of COVID-

19 leading to increased severity in symptoms; uncontrolled Diabetes is closely associated with poor prognosis and increased mortality.<sup>7</sup>

In our study Hypertension was determined to be a very important risk factor for developing severe COVID-19 disease found in 34% of patients presenting with COVID-19 and cardiovascular disease was found in 6% of patients. This finding is supported by multiple studies conducted worldwide. A meta-analysis study conducted on comorbidities of COVID-19 concluded that commonest comorbidities pointed out in patients was hypertension (15.8%), which was followed by cerebrovascular and cardiovascular diseases (11.7%),<sup>8,9</sup> In a study by W-Jie G *et al*, it was concluded most of poor prognosis in patients with COVID-19 has been correlated with cardiovascular comorbid diseases including hypertension and ischemic heart disease.<sup>10</sup>

## CONCLUSION

COVID-19 Pandemic has affected every single person on the face of earth either physically, mentally or emotionally. Our study concludes that individuals with chronic underlying diseases are more prone to have COVID-19 virus disease and develop more severe disease when compared to normal healthy individuals. Thus, vaccination of this segment of society and early identification of disease among these people can help reduce morbidity and mortality.

## LIMITATIONS

Large multi-centered studies are needed to confirm high risk individuals who are prone to develop severe COVID-19 disease.

## SUGGESTIONS / RECOMMENDATIONS

Mass vaccination of high-risk population should be mandatory for protection against severe COVID-19 disease.

## CONFLICT OF INTEREST / DISCLOSURE

No conflict of interest is involved.

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