ORIGINAL ARTICLE

Comorbidities and its Effects on COVID-19 Patients Attribute Mortalities at CMH Attock

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ABSTRACT

Objective: The aim of this Study was to assess the comorbidities in the severe acute respiratory syndrome coronavirus (COVID-19) infected patients and the risk of underlying diseases in more severe patients compared to moderate or mild symptomatic patients.

Study Design: Retrospective study.

Place and Duration of Study: The study was conducted at isolated treatment facility ward of COVID-19 of Combined Military Hospital CMH, Attock, Pakistan from March 2020 to October 2021.

Materials and Methods: The study comprised of a total of 389 confirmed COVID-19 positive cases out of 1990 reported cases which included 28 deaths due to comorbid illnesses. Patients were divided in two groups,one group having co-morbidities and other group with no comorbidity.

Results: There were 389 COVID-19 infected confirmed cases,including 28 deaths of severely ill patients. The deaths were mainly associated with comorbidities and were reported inCMH Attockfrom March 2020 to October 2021.Symptoms included fever followed by cough, fatigue, and dyspnea. The most common comorbidities were hypertension and diabetes, followed by cardiovascular disease and diseases of the respiratory system.

Conclusion: We assessed the prevalence of comorbidities in the COVID-19 patients and concluded that underlying diseases, including hypertension, diseases of respiratory system and cardiovascular diseases, may be risk factors for death inmore severe patients on contrary to moderately or mildly symptomatic patients.

Keywords: *Comorbiditie Characteristics, COVID-19, SARS-CoV-2.*

Introduction

Coronavirus is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), initially reported in Wuhan, China, and spread rapidly all over the world almost to 180 countries. As the novel coronavirus continues to evolve due to mutations, therefore the signs and symptoms varies from patient to patient. Older adults who have underlying comorbid medical conditions, such as hypertension, diabetes and respiratory issues have shown worse prognosis.[1] Among all patients, diabetics patients had higher rates of morbidity and mortality, as well as more admissions to hospitals and intensive care units (ICUs). Patients with chronic obstructive pulmonary disease (COPD) are also at higher risk for severe illness from COVID-19.[2]

A retrospective study in middle-aged and elderly patients infected with COVID-19 found that the elderly population had more susceptibility and were more likely to be admitted to the ICUs in different hospitals and had huge mortality rate.[3] The age-related changes in the elderly population may be due to the changes in anatomy of lungs and muscle atrophy which results in changes in physiological function, reduction of lung capacity and reduction of

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airway.[3] Pakistan being one of the most populated countries in South Asia, with a population of 220.9 million, has been greatly vulnerable to this outbreak.[4] To find out the origin of the virus detailed history taking of patients was crucial not only in understanding this outbreak but also in determining the contacts of patients with other people in their community.[5] The administration had a huge responsibility of constraining the spread through prompt action and adaptation of suitable counter measures in order to avert any catastrophic disaster. It was challenging to control at first, particularly because the general populace did not follow the basic precautions and promptly reporting of the initial symptoms.

Currently evidence from different countries suggested that the comorbid illnesses such as hypertension, diabetes, chronic obstructive pulmonary disease (COPD) and cerebrovascular diseases increase the risk of virus's severity and eventual death.[6] However, there is a significant difference in demographic patterns and trends between different countries[7] and limited data is available on implicating comorbidities.

In the state of Lagos, there is a policy regarding shift to homebased care for COVID-19 patients with mild smptoms.[8] Aiming to discover the comorbidities that are linked to mortality in our population, this study intended to determine the exact groups that are at risk in order to inform risk to communities and early management of COVID-19.

Materials and Methods

This is a retrospective study, which used medical records of 1990 reported cases out of which 389 were confirmed COVID-19 positive cases including 28 deaths mostly due to comorbid illnesses. The cases reported in this study were the patients treated in isolated treatment facility ward for COVID-19 in CMH Attock. This facility has a combined bed capacity of 300 having spaces for suspected undiagnosed patients (contacts of positive cases or with symptoms suggestive of COVID-19) pending confirmation. Those with negative results were discharged from the holding spaces while all those that were confirmed positive were admitted for care. We used medical records of COVID-19 patients admitted between March, 2020 and October, 2021. Inclusion criteria was laboratory confirmed cases

with naso-oropharyngeal specimens that tested positive for the virus by using real-time reverse-transcription–polymerase-chain-reaction (RT-PCR) assay as per the protocol established by WHO.[9] Suspected cases without confirmation of a positive result were excluded from the final analysis. Data was extracted from medical records of the cases as maintained by the hospital. We obtained data on patients age, sex, severity of condition upon presentation at this facility, self-reported comorbidities and outcomes i.e. death and recovery (evidenced by discharge) at the study end date of October, 2021.

Severity of COVID-19 upon presentation at the CMH was based on clinical symptoms and the need for oxygen and ventilation. A patient that was asymptomatic at presentation was classified as mild while a patient was classified as moderate if they had exhibited symptoms such as fever, cough, respiratory rate <30 breaths per minutes and peripheral capillary oxygen saturation (spO2) >90% and respiratory rate >30 breaths per minute, spO2 <90% requiring oxygenation were classified as severeand patients with respiratory failure requiring artificial ventilation were classified as critical.[10] Comorbidities were considered as narrated by the patients and previous treatment they were taking from hospital.

Data analysis was performedusing Statistical package of social science (SPSS) version 18. To determine comorbidity risk factors for death, The data was entered in a computer software Statistical Package for Social Sciences (SPSS) version 18 and was analyzed. Confidence interval was 95% and relative risk was 2.2. Age and sex of patients were considered as confounding variables .The results were assessed to be significant at p<0.05.

Ethical approval was obtained from the Ethics Committee of the hospital. To ensure confidentiality, patient data (date range: March, 2020 to October, 2020) was fully anonymized before being accessed, saved on password protected computers and was handled only by authorized personnel. Informed consent was not required for this study as it depended on previously collected service data and a waiver was issued by the ethics committee.

Results

Out of 1990 patients reported into this health facilities with fever and cough within the study

period, 389 (19.55%) were laboratory confirmed COVID-19 cases. Subsequent analysis was done among the confirmed cases. In figure 1 Symptoms on X-axis and number of patients with these syptoms on Y-axis).
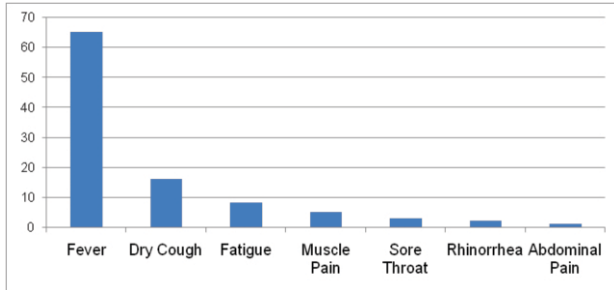

Fig 1: COVID – 19 Clinical Characteristics (Symptoms on X-axis and percentage of patients on Y-axis)

Most of the confirmed COVID-19 cases in this study were male i.e 319 (82.01%) and 70 female (17.99%). They ranged in age from 20 to 90 years with a median age of 45 years. Over half (57.5%) of them were admitted into the facilities in mild clinical condition and 28 of them (7.19%) died while 351 (92.81%) were discharged during the period of study. 192 patients (32.5%) had at least one co-morbidity, figure 2 shows number of patients on X-axis with comorbidities on Y-axis).
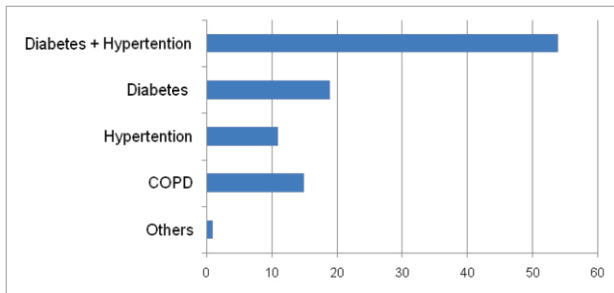

Fig 2: COVID – 19 Comorbidities (comorbidities on Y-axis and percentage of patients with comorbid illness on X-axis)

Compared to patients without comorbidities, significantly higher proportions of patients with comorbidities were aged 50 years and above, presented severe to critical condition and died while on admission ($p<0.05$ and RR 2.2). Outcome of patients admitted in hospital including ICU admissions are highlighted in Figure 3.

Among the ICU admission cases 2 patients were fall between 61 to 80 years of age that shows 100 % death in this age group.
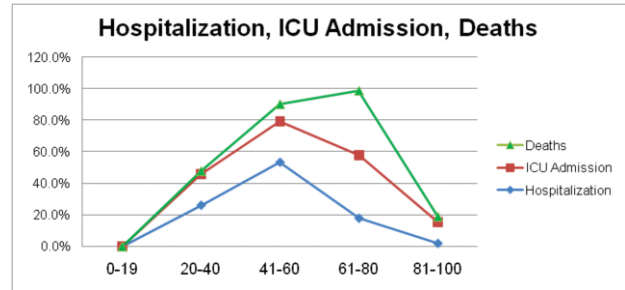
Fig 3: Effects/outcome of Covid-19 Patients

Discussion

This study is presently one of the few to determine risks of comorbid conditions among a sample of COVID-19 patients reported in CMH Attock. In this study, we found that the predominant comorbidities were hypertension and diabetes and that the patients with comorbidities were more likely to die from COVID-19, more so when they had 2 or more comorbidities. We also found that the comorbidities that predicted death were hypertension, diabetes and COPD.

The mortality rate 7.1% was higher than the national rate of 2.23%, possibly because our study included only hospital admissions and because our hospital has the highest of burden of disease.[11] Higher mortality rates have been reported in China, Europe and the US while most countries in Asia had lower mortality compared to the global trend.[12,13] While the reasons for this is not fully understood.[14]

Similar to our findings, hypertension and diabetes were among the most common comorbidities in China and the US. Importantly, hypertension and diabetes are known to co-exist in patients and our findings indicated that having multiple comorbidities increased the risk of death from COVID-19. Certainly, the risk factors such as smoking, poverty, poor nutrition, pulmonary tuberculosis and COPD are prevalent in our country.

Regarding comorbidities in finding hypertension and diabetes are risk factors for mortality.[15] Late presentation of patients in clinical setups leads to late diagnoses which ultimately results in worse condition and a poor prognosis even without COVID-19.[16]

Additional findings in our study showed that male patients were twice as likely to die from COVID-19 than the females and risk of death was higher among patients that were 50 years and older. The analysis of

the results also revealed that the risk is even higher among older adults i.e. 60 years and above. The higher risk of death in men and older adults was similar to global trends.[17] Apart from the higher contribution of men to comorbidities, other suggested reasons for their higher morbidity and mortality include psychosocial and biological differences that favor women. In this study however, the occurrence of comorbidities was not significantly higher in male patients.

Moreover, this study had certain limitations which needs to be considered. Firstly, comorbidities were based on self reporting which could result in underestimation of the true burden of comorbid conditions in the patients since some may be undiagnosed. Secondly, only hospitalized patients were included in the aforementioned study.

Conclusion

In conclusion, this study describes the outcomes of patients with comorbidities in sample of COVID-19 cases, it is crucial to understand risk factors for disease progression and our study helps to fill gaps that currently exist for our populations. Therefore public awareness about high-risk comorbidities and symptoms of COVID-19 illness are very important.Furthermore, specific guidelines need to be developed for management of COVID-19 patients with comorbidities especially in the our context so that special care can be provided to minimize deaths in low socioeconomic countries.

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