*Research Article*

# MORTALITY AND COVID-19: A SNAPSHOT OF A TERTIARY CARE FACILITY IN PAKISTAN

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*Abstract: **Background:** Since SARS CoV-2 infection began in China and has evolved into a pandemic, mortality associated with this illness has been under discussion and hypercoagulability, severe acute respiratory syndrome and septicemia with multiple organ insufficiency have been cursed as potential causes of death in cases infected with the novel coronavirus. We did a retrospective analysis of cases admitted to our highly dependent and intensive care unit, and we tried to identify the leading cause of death in our cases. **Methods:** This is a single center retrospective study carried out at The Bahria International Hospital, Lahore over a 3-month period (May 10th to July 10th, 2020) in which we analyzed the clinical and biochemical profiles of the COVID-19 patients who died during this period. **Results:** A total of 108 patients were admitted during this period out of which 11 patients died. Seven of them were men and 4 women. The majority of them had sudden cardiac arrest due to acute coronary syndrome followed by multiorgan dysfunction syndrome and acute respiratory distress syndrome. **Conclusion:** Acute coronary syndrome due to hypercoagulability was the leading cause of death in our patients.*

## Introduction

Coronavirus diseases 2019 (COVID-19), also known as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), triggered the global pandemic that began in Wuhan in December 2019. Although the majority of patients recover smoothly, in about 19% it resulted in severe pneumonia and in 14% it resulted in critical pneumonia that becomes progressively worse (Mady *et al*., 2020; Zhu *et al*., 2020b). To date, over 20 million cases of COVID-19 have been confirmed worldwide, with deaths reaching a million. Different specialists have described a detailed and diversified proportion of victims varying from 4.2% to 11% (Lima *et al*., 2020; Tabassum *et al*., 2020). A national level review in China which included 1099 patients with COVID - 19 has referenced that 5% of cases were sufficiently serious to be admitted to ICU

and their casualty rate was 1.36% (Ali *et al*., 2020; Siddique *et al*., 2020; Tu *et al*., 2020). The total number of COVID-19 patients to date are approximately 0.3 million with under 7000 deaths in total (Seah and Agrawal, 2020).

The virus belongs to a genus similar to the severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East Respiratory Syndrome (MERS-CoV) and was therefore named SRAS-CoV-2 by the International Committee on Virus Taxonomy on February 11, 2020. However, SARS-CoV-2 is more infectious than SARS-CoV and MERS-CoV, with more than 84,000 cases in China and more than 4,200,000 cases globally as of May 12, 2020, by Science and Systems Engineering Community at John Hopkins University (David *et al*., 2020). On February 11, 2020, the World Health Organization officially named the new coronavirus (COVID-19)

illness. SARS-CoV-2 is susceptible to transmission in family groups or to outbreak in hospitals (Azkur *et al*., 2020; Nadeem *et al*., 2021; Zheng *et al*., 2020a). Most COVID-19 patients experience mild and moderate symptoms, but severe cases may include acute respiratory distress syndrome (ARDS), multiple organ dysfunction syndrome, and even death. The mortality rate associated with COVID-19 varies from 1.4% to 4.3% in several regions or hospitals (Aggarwal *et al*., 2020).

**Methodology**

The present retrospective study was carried out at the Bahria International Hospital, Lahore (31° 34' 55.3620' N and 74° 19' 45.7536' E) from 10 May to 10 July 2020. The study has been approved by the Institutional Review Board and Ethical committee. A total of 108 (n=108) cases of COVID-19 infection confirmed by reverse transcription polymerase chain reaction (RT-PCR) were added to the study after obtaining informed written consent (Zhu *et al*., 2020a). In this study, we focus on reviewing and highlighting the clinical and biochemical features of our fatal cases. Clinical and laboratory test results, along with clinical management data, were obtained using medical record data collection forms. The data were reviewed by most experienced physicians of hospital. Information collected included demographics, medical history, underlying products, laboratory results and details of clinical management. Continuous variables were measured in percentages and the standard deviation (SD) was computed numbers and percentages (%). Deviation of body biochemistry from normal ranges also described for the analysis of patient laboratory results. For statistical analysis, SPSS (version 21.0) was used.

**Results**

In this study, one hundred and eight admitted cases were included between May 10 and July 10. Thirty patients were transferred to the ICU and eleven of the thirty patients died of severe COVID-19 infection. Analysis of biochemical variables and clinical status demonstrated that men with comorbidity are more likely to develop a critical stage. The mean age was 56.36 years (interquartile range 42 to 68 years). 7 (63.63%) were men, while 4 (36.36%) were women. The average time between clinical onset and presentation on the day of death in hospital was 7 days (IQR-1-15 days), as indicated in the table below. Men were in=7 (63.6 per cent) and women were n=4 (36.4 per cent). Comorbidities have been observed in all deaths. The most common comorbidity was COPD n=5 (45.5%), followed by hypertension n=3 (27.3%) and ischemic heart disease n=3 (27.3%). Over this study period, 108 confirmed

COVID-19 cases resulted in death or discharge, resulting in a death rate of 10.18%. The most common cause of death was Cardiac arrested 7 (63.6%) followed by multi organ dysfunction syndrome 2 (18.2%) followed by ARDS (acute respiratory distress syndrome) 2 (18.2%) (Figure 2). ARDS, Secondary bacterial infection, especially after the administration of Tocilizumab, (Tocilizumab is a recombinant humanized anti-interleukin-6 receptor (IL-6R) monoclonal antibody which has a main use in the treatment of rheumatoid arthritis) (Nicola *et al*., 2020). Acute renal injury and acute liver injury were common during hospitalization and resulted in a number of ICU admissions. All patients were given mechanical ventilation, corticosteroid (Methyl Prednisolone 40 mg BD intravenous) antibiotics, including azithromycin. Antibiotics were intensified in 4 cases amidst worsening septic shock. Interestingly 7 cases died suddenly after they had been weaned off from mechanical ventilation and were out of secondary septic shock on acceptable Oxygen supplementation (5-6 liters per minute via simple face masks maintaining their $SpO_2$ 96 to 97%). All developed sudden bradycardia followed by asystole and did not respond to CPR. Cardiac MR was done in a few cases to differentiate the acute MI from Myocarditis as the cause of rise of Troponins and that showed acute ischemic injury to myocardium strengthening our impression of Acute Coronary Syndrome to be the reason of sudden cardiovascular collapse (Figure 1). 4 cases experienced severe septic shock and multi-organ failure, whereas 2 cases had refractory ARDS and could not be oxygenated. All patients were treated with tocilizumab because they met the criteria for Cytokine Release Syndrome (CRS) (Gietema *et al*., 2020; Lauretani *et al*., 2020). Analysis of the biochemical profile indicated that serum levels of ferritin, LDH and D-Dimers were higher among non-residents (mean = 1,370.22).
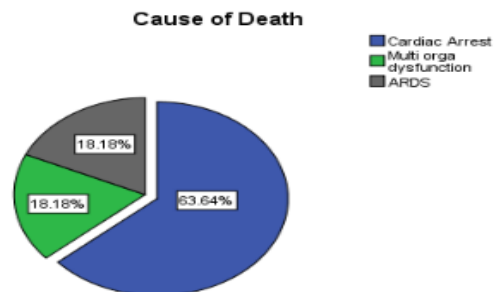
**Cause of Death**



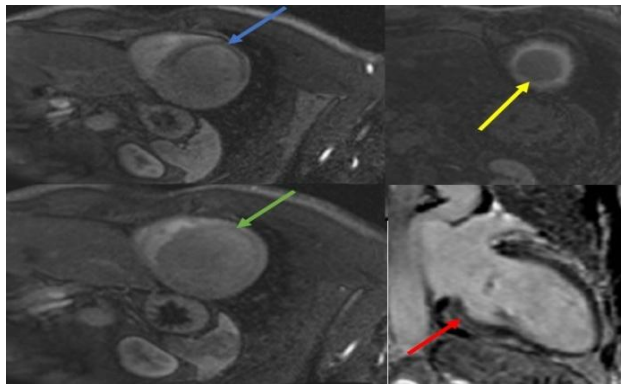Figure 2. Death cause percentage

Figure 1: Cardiac Magnetic Resonance Images (CMR) - Reversible ischemia in anterior, anteroseptal and anterolateral wall segments (blue arrow) in a patient having LAD disease with corresponding rest image (green arrow). Apical infarct (yellow arrow) in another patient and myopericarditis (red arrow) in different patient on late gadolinium images

**Table 1. Characteristics and laboratory results of included fatal cases of COVID-19**

|  | Mean (max-min) | N (%) |
|---|---|---|
| **Age** | 56.36 (42-68) |  |
| **Sex** |  |  |
| Male |  | 7(63.6%) |
| Female |  | 4(36.4%) |
| **Number of days** | 7 (1-15) |  |
| **Co-morbidities** |  |  |
| Hypertension |  | 5(45.5%) |
| COPD |  | 3(27.3%) |
| IHD |  | 3(27.3%) |
| **Lab Values** |  |  |
| Serum Ferritin | 1051.41(474-1668) |  |
| *Ferritin >362 ng/ml* |  | 11(100%) |
| Serum LDH | 460.79 (45-683) |  |
| *LDH >220 u/L* |  | 11(100%) |
| D-Dimers | 1370.22 (373-1725) |  |
| *D-Dimers > 500* |  | 10(90.09%) |
| Lymphocyte count | 11.80 (05-68) |  |
| *Lymphocytes < 40%* |  | 10(90.09%) |
| Neutrophils Ratio | 88.87 (86-91) |  |
| *Neutrophils > 80%* |  | 11(100%) |
| **Tocilizumab** |  | 11(100%) |
| **Cause of death** |  |  |
| Cardiac Arrest |  | 7(63.6%) |
| Multiorgan dysfunction |  | 2(18.2%) |
| ARDS |  | 2(18.2%) |

The table describes the characteristics and laboratory results of all fatal cases included. In this study, 63.6% of fatal cases were male and 36.4% were female, with an average age of 56.36 years. The number of days of patients remaining in hospital has been at most 15 fatal cases have Co morbidities Hypertension. COPD and HDD, but the hypertension rate was very high 45.5% were with hypertension and 27.3% were combated cause was COPD and HDI. Another important concern raised by this study was the high readings of laboratory values we included in this case some selected parameters of Covid-19 patient's labs like serum ferritin, LDH, D-Dimers, Lymphocytes, and neutrophils. According to the results of this study, the average mean of serum Ferritin was 1051, minimum=474, maximum=1668 and these values were higher than the normal fruition in all patients. Similarly, the serum LDH mean value was 460.79, minimum=460, maximum=683 these values were also higher in all cases. It was noted that in all fatal cases, serum ferritin and D dimer levels remained higher (average = 1051.41) throughout treatment, while other markers were observed with a decreasing trend.

## Discussion

The table describes the characteristics and laboratory results of all fatal cases included. In this study, 63.6% of fatal cases were male and 36.4% were female, with an average age of 56.36 years. The number of days of patients remaining in hospital has been at most 15 fatal cases have Co morbidities Hypertension. COPD and HDD, but the hypertension rate was very high 45.5% were with hypertension and 27.3% were combated cause was COPD and HDI. Another important concern raised by this study was the high readings of laboratory values we included in this case some selected parameters of Covid-19 patient's labs like serum ferritin, LDH, D-Dimers, Lymphocytes, and neutrophils. According to the results of this study, the average mean of serum Ferritin was 1051, minimum=474, maximum=1668 and these values were higher than the normal fruition in all patients. Similarly, the serum LDH mean value was 460.79, minimum=460, maximum=683 these values were also higher in all cases. It was noted that in all fatal cases, serum ferritin and D dimer levels remained higher (average = 1051.41) throughout treatment, while other markers were observed with a decreasing trend.

## Conclusion

We can conclude from this study that the comorbid condition with Covid-19 infection has drastic outcomes and major cause of death in Bahira Town International Hospital, Lahore was acute coronary syndrome due to hypercoagulability. Furthermore, biochemical disturbance was also seen in all patients who were critically ill.

## Recommendations

It is recommended, on the basis of above discussion, that the people with co morbid condition should take great care of themselves, and clinicians should deal with hypercoagulable state with great concern.

## Conflict of interest

The authors declared no conflict of interest.

## Funding status

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