

Letter to the Editor

Age, sex, and comorbidities related trajectories of deceased COVID-19 patients in Balochistan, Pakistan

Dear Editor,

We read with immense interest the article published in this journal by A. Di Stadio et al¹. The authors described in detail the characteristics of COVID-19 patients based on age, sex and comorbidities differences. In this report, we also investigated the sex age, and comorbidities-related differences in deceased COVID-19 patients in Balochistan (Pakistan) and we would like to report some data as follows.

Since the outbreak of COVID-19, over 263 million cases including over 5 million deaths have been reported across the globe (as of December 1, 2021). In addition, the number of confirmed COVID-19 cases in Pakistan reached 12,85,254 including 28,737 deaths since February 26, 2020².

Balochistan is one of the fourth provinces of Pakistan located at the eastern edge of the Iranian plateau. It is geographically the largest province of Pakistan. Balochistan represents the 42% of the total land area of the country. In this province, the population density is very low due to the mountainous terrain. As of December 1, 2021, a total of 33,484 confirmed COVID-19 cases, including 360 deaths, have been reported from Balochistan³.

Analysis of age, sex, and comorbidities-related data are essential to understand the risk factors of COVID-19 infection and mortality. The present study was designed to compare sex, age and comorbidities in patients who died due to COVID-19 infection. Data collection was carried out from 13 March 2020 to 25 October 2021. The confirmed diagnosis of COVID-19 was defined as a positive result by using real-time RT-PCR on the throat or nasopharyngeal swabs. The study was approved by the Internal Review Board of the National Institute of Health (NIH) Islamabad, Pakistan. The NIH Research Committee waived the requirement of written informed consent. Complete epidemiological and clinical data were collected from the hospitals' medical records.

From 13 March 2020 to 25 October 2021, the total of 326 COVID-19 patients died in Balochistan. All patients with a diagnosis of laboratory-confirmed COVID-19 infection were included in the present study. Out of total 326 deceased COVID-19 patients, the greatest proportion 62.8% (205/326) were male compared to 37.1% (121/326) were female individuals. The mean age of deceased COVID-19 patients at the time of death was 60.1 ± 14.4 years. The majority [83% (270/326)] of deceased COVID-19 patients belonged to the >50 years of age. On the other hand, 17% (56/326) of patients belonged to <50 years of age group. Fever was noted in 96.6% (315/326) of deceased COVID-19 patients at the time of hospital admission with a significant difference ($p < 0.0001$) in the <50 and >50 years of age group. An increased level of neutrophils was found in 74% of COVID-19 patients with a significant difference ($p < 0.0001$) between both groups. An increased level of C-reactive protein was found in almost 100% of patients in both age groups. No significant differences were observed for comorbidities, such as cardiovascular disease, hypertension, coronary artery diseases, asthma, pneumonia, tuberculosis, liver disease and diabetes mellitus between both age groups. Demographic, clinical and laboratory characteristics of deceased COVID-19 patients are presented in Table I.

The risk of death from COVID-19 strongly depends on age, gender and underlying medical conditions. Older patients with chronic comorbidities are much more prone to critical and even fatal disease outcomes.

Table 1. Demographics, clinical and laboratory characteristics of deceased COVID-19 patients in Balochistan.

Demographic and clinical features	Total Deaths n = 326 (%)	< 50 Years n = 56 (%)	> 50 Years n = 270 (%)	p-value
Age (Mean + SD)	60.1 + 14.4	37.2 + 10.9	64.8 + 9.7	< 0.0001
Patients' hospitals stay (Days)	7.75 + 6.9	7.8 + 7.1	7.7 + 6.9	0.923
Gender				
Male	205 (62.8)	28 (50)	177 (65.5)	0.028
Female	121 (37.1)	28 (50)	93 (34.4)	0.028
Fever	315 (96.6)	47 (84)	268 (99)	< 0.0001
Oxygen Saturation, Median (IQR)	73 (63-86)	77 (66-87)	69 (61-81)	0.033
Oxygen Saturation < 90%	321 (98.4)	52 (92.8)	269 (99.6)	< 0.0018
Heart Rate > 100 beats/min	273 (83.7)	38 (67.8)	235 (87)	< 0.0004
Laboratory Findings				
WBCs Count ($4-10 \times 10^9/L$)	7.8 (4.3-13.6)	7.6 (4.6-11.5)	8.3 (5.1-13.8)	0.842
Neutrophils ($2-7 \times 10^9/L$)	6.7 (4.4-11.8)	5.8 (3.8-7.9)	7.3 (4.9-12.3)	0.67
Neutrophils < $2 \times 10^9/L$	7 (2.1)	1 (1.7)	6 (2.2)	0.833
Neutrophils > $7 \times 10^9/L$	243 (74.5)	26 (46.4)	217 (80.3)	< 0.0001
Lymphocytes ($1-3 \times 10^9/L$)	0.4 (0.3-0.7)	0.5 (0.3-0.8)	0.4 (0.2-0.8)	0.977
Lymphocytes < $1 \times 10^9/L$	303 (93)	41 (73.2)	262 (97)	< 0.0001
ALT, U/L	35 (24.5-61.3)	27 (22.3-51.5)	41 (28.5-84.5)	< 0.091
ALT (> 40 U/L)	83 (25.5)	11 (19.6)	72 (26.6)	0.271
ALP, U/L	294 (150-485)	243 (144-415)	317 (178-493)	< 0.0001
ALP (> 306 U/L)	184 (56.4)	22 (39.2)	162 (60)	0.004
Serum Albumin, g/dL	3.3 (2.9-4.8)	3.2 (2.8-4.8)	3.1 (2.6-4.3)	0.977
Serum Albumin < 3.5 g/dL	253 (77.6)	37 (66)	216 (80)	0.002
Creatinine, mg/dl	0.8 (0.4-1.3)	0.6 (0.4-1.2)	0.8 (0.5-1.3)	0.955
Creatinine > 1.2 mg/dl	32 (9.8)	9 (16)	23 (8.5)	0.083
LDH, U/L	495 (355-765)	450 (337-745)	525 (365-785)	< 0.0001
LDH (> 250 U/L)	305 (93.5)	42 (75)	263 (97.4)	< 0.0001
CRP, mg/L	44 (28-97)	41 (28-87)	48 (33-103)	0.05
CRP (> 10 mg/L)	326 (100)	56 (100)	270 (100)	< 0.0001
Comorbidities	301 (92.3)	46 (82.1)	255 (94.4)	0.0016
Cardiovascular Diseases				
Hypertension	24 (7.9)	5 (8.9)	19 (7)	0.624
Coronary Artery Disease	7 (2.3)	1 (1.7)	6 (2.2)	0.833
Congestive Heart Failure	5 (1.66)	0	5 (1.8)	0.303
Respiratory Diseases				
COPD	13 (4.3)	0	13 (4.8)	0.09
ARD+CRDs+Asthema	34 (11.2)	6 (10.7)	28 (10.3)	0.936
Pneumonia	164 (54.4)	25 (44.6)	139 (51.4)	0.352
Tuberculosis	6 (1.9)	1 (1.7)	5 (1.8)	0.976
Chronic Renal Disease	6 (1.9)	4 (7.1)	2 (0.7)	0.001
Liver Disease	21 (6.9)	6 (10.7)	15 (5.5)	0.152
Metabolic Diseases				
Obesity (BMI > 30)	76 (25.2)	23 (41.1)	49 (18.1)	0.0016
Morbid Obesity (BMI > 35)	23 (7.6)	4 (7.1)	19 (7)	0.976
Diabetes Mellitus	25 (8.3)	3 (5.3)	22 (8.1)	0.477

WBCs = White blood cells, ALT= Alanine aminotransferase, ALP = Alkaline Phosphatase, LDH = Lactate dehydrogenase, CRP = C-Reactive Protein, COPD = Chronic obstructive pulmonary disease, ARD = Acute respiratory distress syndrome, CRDs = Chronic respiratory diseases. Data are presented with median (IQR) and 'n' (%), where 'n' is the total number of patients with COVID-19.

The finding of the present study indicates that age, gender and comorbidities are variables that directly influence the clinical outcome of COVID-19 patients. Individuals in the age 0-50 years and female gender are less likely to develop a severe condition and die. However, males above 50 years of age are more likely at high risk of severe COVID-19 infection and death.

SARS-CoV-2 infection is dangerous, irrespective of whether the patient is young, old, male or female as it has been reported that 86% of COVID-19 related deaths cases have exhibited comorbidities. Data reported highlight that patients of any age with comorbidities are at high

risk of COVID-19 infection. In the present study, the highest percentage of deaths in the male and old age group has been documented and similar findings have been reported from other countries^{4,5}. The present study provides preliminary estimates of the association of age, gender and comorbidities with COVID-19 deaths in Balochistan (Pakistan). However, large case series from all parts of the world with further correlation with the risk factors such as age, gender and comorbidities will allow a better epidemiological and pathological understanding of COVID-19 infection. It is recommended that patients of any age or gender with underlying medical conditions must be considered as a priority group for COVID-19 vaccination. Multiple families lost their loved ones during this pandemic. Ending this crisis will require further advances in diagnostics, treatment and vaccination. The unprecedented commitment to all aspects of prevention, vaccination and public health is needed to revert this crisis to an unknown condition.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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