Steroid use and outcome of COVID-19 in subset of Pakistani population

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Abstract:
The unique 2019 coronavirus illness (COVID-19) spread quickly in China before affecting 213 nations in Europe, America, Australia, and Asia, including Pakistan. Some virus-infected individuals don't exhibit any symptoms and some had severe symptoms. Afterward, corticosteroid (dexamethasone) has been shown to improve survival in hospitalized patients who require supplementary oxygen, with the highest effect seen in those who require mechanical breathing. Our goal was to ascertain whether steroids had any impact on how severely ill COVID-19 individuals would fare. This cross-sectional study was carried out from April 2020 to September 2020 by recruiting 143 COVID-19 PCR-positive patients who visited the OPD, wards, and ICU at the Ziauddin Hospital using the non-probability consecutive sampling technique. Among all PCR-positive patients majority were severe (45: 31.5%) followed by critical (32: 22.3). Males were predominant (80; 55.9%) with an age of presentation of more than 50 years (106: 74.1%). Fever (90: 62.9) was the most frequent symptom encountered in all patients with dyspnea (87: 60.8%) being the second most common symptom. 25 (17.5%) patients discharged who did not receive any steroid were asymptomatic and mild while 37 (25.9%) received steroids for ≤3 days and 48 (33.6%) who had steroids for >3 days and were discharged. 20 (14%) patients who had steroids for >3 days and 13 (9.1%) patients who had steroids for ≤days died during the course of their hospital stay. Early steroid use and if used for more than 3 days during the hospital stay increased the chances of recovery and early discharge. Dexamethasone as a single use is more effective as compared to the combination steroid use in terms of the outcome of the patient.

Key Words: COVID-19, steroids, dexamethasone, severity, PCR

I. INTRODUCTION:

COVID-19 is causing widespread concern for a variety of reasons, as it's a new virus so no one is immune. (1) It is very contagious and spreads quickly because scientists don't know exactly how it behaves because there isn't much precedent to depend on. India, Iran, and Pakistan have the 7th largest number of confirmed cases in Asia, 3rd in South Asia, and the 30th largest number of confirmed cases in the world. (2) However, the fatality rate has remained low at 2.1 On September 3, 2022, data was updated to reflect that there were 1,569,788 confirmed positive cases, 3.588 (1.9%) recorded deaths, and 1.530.962 (97.5%) recovered cases. (3) In various hospitals across Pakistan, 8238 (2.5%) active cases are being treated. The rate is estimated to be highest in Sindh, where there have been 593,444 confirmed cases (37.8%), out of whom 8232 (1.4%) have passed away due to the disease's severity and 567,237 (95.5%) have recovered, as opposed to Punjab. 13 609 (2.6%) of the 521 279 (33.2%) reported incidences resulted in death, whereas 491, 786 (94.3%) of the cases were successfully treated and allowed to be discharged. (4) There were 212,886 (95.1%) recoveries, 6,354 (2.8%), cases totaling 223,630 (14.24%), and 6,354 (2.8%) fatalities in KPK. Baluchistan currently has 35,949 confirmed cases (2.29%), 378 (1%) fatalities, and 35,108 (97.6) recoveries. The two provinces with the fewest cases were Gilgit Baltistan (12,022 cases, 0.76 percent), Azad Jammu Kashmir (44,237 cases, 2.80 percent), and Azad Kashmir (793 cases, 1.71 percent), respectively. Sindh, Pakistan, had the highest reported rate of Covid-19 infection. (5) Severe sickness can strike otherwise healthy people of any age, but it mostly affects older adults or certain concomitant medical conditions. (6) Severe sickness has been linked to several comorbidities and underlying diseases (ie, infection resulting in hospitalization, admission to the ICU, intubation or mechanical ventilation, or death). (7) Treatment protocol remained in flux as earlier chloroquine was suggested to be effective but later it was proved to have no role in the management of COVID-19. (8) Patients with COVID-19 should receive supportive treatment and symptomatic management, according to the COVID-19 Treatment Guidelines Panel (the Panel); efforts should also be taken to decrease the risk of SARS-CoV-2 transmission to others. (9) Afterwards corticosteroid (dexamethasone) has been shown to improve survival in hospitalized patients who require supplementary oxygen, with the highest effect seen in those who require mechanical breathing. (10) As a result, dexamethasone is strongly advised in this condition. In September 2020, the WHO published a recommendation on the use of dexamethasone and other corticosteroids (hydrocortisone or prednisone) for treating seriously ill COVID-19 patients. (11) Following the RECOVERY trial and WHO recommendations, steroids are now more frequently used in patients who are admitted to the hospital and require oxygen, as opposed to being utilized in the ICU for a small number of very severe patients. (12) Our goal was to ascertain whether steroids had any impact on how severely ill COVID-19 individuals would fare.

II. METHODS

Patient recruitment:

This cross-sectional study was completed with the ethics review committees of Ziauddin University's consent. (Reference code 2650920SKPAT) According to the laws, regulations, and institutional policies, the study was carried out. From April 2020 to September 2020, 143 COVID-19 PCR-positive patients visited the wards, and ICU at the Ziauddin Hospital locations in Clifton, KDLB, and North Nazimabad using the non-probability consecutive sampling technique. The trial's participants gave written informed consent, as did each participant under the age of 18 and their parent or legal guardian. Patients under the age of 14, those with mental illnesses, people who had received chemotherapy or radiation treatment, people

who had cancer of any kind, and anyone who hadn't provided their consent were excluded.

COVID-19 in vitro diagnostic test:

SARS-CoV-2 RNA positivity was determined using qualitative RT-PCR with in vitro diagnostic kits, following the manufacturer's recommendations. SARS-CoV-2 positive patients had at least one positive RT-PCR test result, while SARS-CoV-2 negative patients had solely negative RT-PCR test findings.

Clinico-pathological parameters of study participants:

Demographic information, clinical details, and outcomes were provided through electronic patient records. Each patient's age, sex, medical history, initial symptoms (fever, cough, and dyspnea), and prognosis were all noted. The following definition of severity was used by the CDC: "Asymptomatic" refers to the absence of any signs or symptoms; "mild" refers to patients, whether inpatients or outpatients, who do not exhibit any signs of dyspnea but do not require oxygen; "moderate" refers to hospitalized patients who exhibit these signs but do not require high flow oxygen; and "critical" refers to all patients who require mechanical ventilation, all COVID-19-related deaths that take place during the hospital stay, or both. (13)

Steroid:

Patients presented with shortness of breath either in emergency or admitted to the hospital were given steroids based on the consultant's decision. Any patient who got only a single dose in an emergency as a rescue or preventive dose considered as steroid "not used". The number of doses and days of steroid used were recorded from prescription and divided into either ≤3 days used, > 3 days used, or single and combination of steroids given during the stay.

Statistical analysis:

SPSS version 21 was used for all statistical analyses. All dependent variables in COVID-19 had their frequencies and percentages calculated. We used the Chi-Square test was used to analyze the relationship between all dependent variables and clinicopathological features.

III. Results:

Demographic and clinical characteristics of the patients:

Among all PCR-positive patients majority were severe (45: 31.5%) followed by critical (32: 22.3). Males were predominant (80; 55.9%) with the age of presentation of more than 50 years (106: 74.1%). Most of the patients included had diabetes mellitus (71: 49.4%) and hypertension (83: 58%). Few of them also had other known diseases of other systems like cardiovascular (22: 15.4%), respiratory (7: 4.9%), and many more. Fever (90: 62.9) was the most frequent symptom encountered in all patients with dyspnea (87: 60.8%) being the second most common symptom. Almost all inflammatory markers were raised in every patient, procalcitonin (139: 97.2%) being the most frequently raised marker.

On comparing the demographic and clinical characteristics with the severity of the COVID-19 disease we found a significant statistical association of age (p value, 0.016), gender ((p value, 0.022). fever (p value, 0.001), cough (p value, 0.001), dyspnea (p value, 0.001), loss of taste (p value, 0.001), de-dimer (p value, 0.001), LDH (p value, 0.001), ferritnin (p value, 0.001),and CRP (p value, 0.001). Patients having the age more than 50 years are at more risk to acquire severe or critical diseases and may need oxygen at the time of presentation. We also found that males are more prone to have the COVID infection with more severity. Fever, cough, and dyspnea are the symptoms that were frequently present in every severity from mild to critical while the loss of taste and smell were more related to mild and moderate diseases. Table: 1

While comparing the steroid used in terms of the number of days diabetes mellitus, gender and ethnicity revealed no statistical association while age (p=0.001), severity (p=0.001), and outcome (p=0.010) had a significant link with the steroid used. None of the asymptomatic patients received steroids and only 6 mild patients received steroids for less than 3 days if they have shortness of breath. 25 (17.5%) patients discharged who did not receive any steroids were asymptomatic and mild while 37 (25.9%) received steroids for ≤3 days and 48 (33.6%) had steroids for >3 days and were discharged. 20 (14%) patients who had steroids for >3 days and 13 (9.1%) patients who had steroids for ≤days died during the course of their hospital stay. Table.2. 61 (42.7%) received the single (Dexamethasone only) and 24 (16.5%) received the combination of steroids (Dexamethasone with other steroids) and were discharged with significant statistical association (p=0.001). Table 3.

Table: 1. Association of demographic and clinical characteristics with the severity of the disease.

Characteristics	n=143	Severity					p value[a]
		Asymptomatic 20 (14%)	**Mild 11 (7.7%)**	**Moderate 35 (24.5%)**	**Severe 45 (31.5%)**	**Critical 32 (22.3%)**	
Age (Years)							
<=50	37 (25.9%)	11 (7.7%)	3 (2.1%)	5 (3.5%)	12 (8.4%)	6 (4.2%)	0.016*
>50	106 (74.1%)	9 (6.3%)	8 (5.6%)	30 (21%)	33 (23.1%)	26 (18.2%)	
Gender							
Male	80 (55.9%)	11 (7.7%)	3 (2.1%)	22 (15.4%)	20 (14%)	24 (16.8%)	
Female	63 (44.1%)	9 (6.3%)	8 (5.6%)	13 (9.1%)	25 (17.5%)	8 (5.6%)	0.022*
Ethnicity							
Sindhi	35 (24.5%)	7 (4.9%)	4 (2.8%)	9 (6.3%)	9 (6.3%)	6 (4.2%)	
Urdu	82 (57.3%)	9 (6.3%)	6 (4.2%)	22 (15.4%)	25 (17.5%)	20 (14%)	0.545
Punjabi	18 (12.6%)	2 (1.4%)	0 (0%)	2 (1.4%)	8 (5.6%)	6 (4.2%)	
Pathan	8 (5.6%)	2 (1.4%)	1 (0.7%)	2 (1.4%)	3 (2.1%)	0 (0)	
Hypertension							
Yes	83 (58%)	10 (7%)	8 (5.6%)	19 (13.3%)	31 (21.4%)	15 (10.5%)	0.238
No	60 (42%)	10 (7%)	6 (2.1%)	16 (11.2%)	14 (9.8%)	17 (11.9%)	
Diabetes Mellitus							
Yes	71 (49.7%)	8 (5.6%)	6 (4.2%)	15 (10.5%)	24 (16.8%)	18 (12.6%)	0.689
No	72 (50.3%)	12 (8.4%)	5 (3.5%)	20 (14%)	21 (14.7%)	14 (9.8%)	
Fever							
Yes	90 (62.9%)	0 (0%)	4 (2.8%)	27 (18.9%)	35 (24.5%)	24 (16.8%)	0.001*
No	53 (37.1%)	20 (14%)	7 (4.9%)	8 (5.6%)	10 (7%)	8 (5.6%)	
Cough							
Yes	58 (40.6%)	0 (0%)	4 (2.8%)	14 (9.8%)	28 (19.6%)	12 (8.4%)	0.001*
No	85 (59.4%)	20 (14%)	7 (4.9%)	21 (14.7%)	17 (11.9%)	20 (14%)	
Dyspnea							
Yes	87 (60.8%)	0 (0%)	3 (2.1%)	20 (14%)	38 (26.6%)	26 (18.2%)	0.001*
No	56 (39.2%)	20 (14%)	8 (5.6%)	15 (10.5%)	7 (4.9%)	6 (4.2%)	
Bodyache							
Yes	(18 (12.6%)	0 (0%)	4 (2.8%)	5 (3.5%)	6 (4.2%)	3 (2.1%)	0.062
No	125 (87.4%)	20 (14%)	7 (4.9%)	30 (21%)	39 (27.3%)	29 (20.3%)	
Loss of Taste							
Yes	4 (2.8%)	0 (0%)	2 (1.4%)	2 (1.4%)	0 (0%)	0(0%)	0.009*
No	139 (97.2%)	20 (14%)	9 (6.3%)	33 (23.1%)	45 (31.5%)	32 (22.3%)	
Loss of Smell							
Yes	6 (4.2%)	0 (0%)	2 (1.4%)	2 (1.4%)	2 (1.4%)	0(0%)	0.098
No	137 (95.8%)	20 (14%)	9 (6.3%)	33 (23.1%)	43 (30.1%)	32 (22.3%)	
TLC							
Raised	120 (83.9%)	17 (11.9%)	9 (6.3%)	32 (22.4%)	37 (25.9%)	25 (17.5%)	
Normal	21 (14.7%)	2 (1.4%)	1 (0.7%)	3 (2.1%)	8 (5.6%)	7 (4.9%)	0.185
Below Normal	2 (1.4%)	1 (0.7%)	1 (0.7%)	0 (0%)	0 (0%)	0 (0%)	
De-Dimer							
Raised	105 (73.4%)	5 (3.5%)	8 (5.6%)	26 (18.2%)	38 (26.6%)	28 (19.6%)	0.001*
Normal	38 (26.6%)	15 (10.5%)	3 (2.1%)	9 (6.3%)	7 (4.9%)	4 (2.8%)	
Ferritin							
Raised	100 (69.9%)	8 (5.6%)	7 (4.9%)	29 (20.3%)	30 (21%)	26 (18.2%)	0.008*
Normal	43 (30.1%)	12 (8.4%)	4 (2.8%)	6 (4.2%)	15 (10.5%)	6 (4.2%)	
LDH							
Raised	127 (88.8%)	9 (6.3%)	10 (7%)	32 (22.4%)	44 (30.8%)	32 (22.3%)	0.001*
Normal	16 (11.2%)	11 (7.7%)	1 (0.7%)	3 (2.1%)	1 (0.7%)	0 (0%)	
CRP							
Raised	92 (64.3%)	4 (2.8%)	3 (2.1%)	23 (16.1%)	39 (25.2%)	26 (18.2%)	0.001*
Normal	51 (35.7%)	16 (11.2%)	8 (5.6%)	12 (8.4%)	9 (6.3%)	6 (4.2%)	
Pro-calcitonine							
Raised	139 (97.2%)	20 (14%)	10 (7%)	35 (24.5%)	43 (30.1%)	31 (21.7%)	0.456
Normal	4 (2.8%)	0 (0%)	1 (0.7%)	0 (0%)	2 (1.4%)	1 (0.7%)	
Outcome							
Death	33 (23.1%)	0 (0)	1 (0.7%)	3 (2.1%)	12 (8.4%)	17 (11.9%)	0.001*
Discharge	110 (76.9%)	20 (14%)	10 (7%)	32 (22.3%)	33 (23.1%)	15 (10.5%)	

*significant p value ($P < 0.05$), [a]Chi square test, [a]Cardiovascular includes the ischemic heart disease, coronary artery disease and valvular disease, it does not include the arterial diseases and hypertension. [b]Endocrine diseases do not include the diabetes mellitus.

Table: 2 Association of demographic and clinical characteristics with the duration of steroids used

Characteristics	n=143	Steroid			p-value[a]
		Not used	≤3 Days	>3 Days	
Age (Years)					
<=50	37 (25.9%)	14 (9.8%)	9 (6.3%)	14 (9.8%)	0.001*
>50	106 (74.1%)	11 (7.7%)	41 (28.7%)	54 (37.8%)	
Gender					
Male	80 (55.9%)	12 (8.4%)	25 (17.5%)	43 (30.1%)	0.244
Female	63 (44.1%)	13 (9.1%)	25 (17.5%)	25 (17.5%)	
Ethnicity					
Sindhi	35 (24.5%)	9 (6.3%)	9 (6.3%)	17 (11.9%)	0.659
Urdu	82 (57.3%)	12 (8.4%)	32 (22.4%)	38 (26.6%)	
Punjabi	18 (12.6%)	2 (1.4%)	6 (4.2%)	10 (7%)	
Pathan	8 (5.6%)	2 (1.4%)	3 (2.1%)	3 (2.1%)	
Severity					
Asymptomatic	20 (14%)	20 (14%)	0 (0%)	0 (0%)	
Mild	11 (7.7%)	5 (3.5%)	6 (4.2%)	0 (0%)	0.001*
Moderate	35 (24.5%)	2 (1.4%)	14 (9.8%)	19 (13.3%)	
Severe	45 (31.5%)	0 (0%)	18 (12.6%)	27 (18.9%)	
Critical	32 (22.4%)	0 (0%)	10 (7%)	22 (15.4%)	
Hypertension					
Yes	83 (58%)	11 (7.7%)	37 (25.9%)	35 (24.5%)	0.015*
No	60 (42%)	14 (9.8%)	13 (9.1%)	33 (23.1%)	
Diabetes Mellitus					
Yes	71 (49.7%)	10 (7%)	31 (21.7%)	30 (21%)	0.090
No	72 (50.3%)	15 (10.5%)	19 (13.3%)	38 (26.6%)	
Fever					
Yes	90 (62.9%)	4 (2.8%)	36 (25.2%)	50 (35%)	0.001*
No	53 (37.1%)	21 (14.7%)	14 (9.8%)	18 (12.6%)	
Cough					
Yes	58 (40.6%)	3 (2.1%)	25 (17.5%)	30 (21%)	0.005*
No	85 (59.4%)	22 (15.4%)	25 (17.5%)	38 (26.6%)	
Dyspnea					
Yes	87 (60.8%)	0 (0%)	36 (25.2%)	51 (35.7%)	0.001*
No	56 (39.2%)	25 (17.5%)	14 (9.8%)	17 (11.9%)	
Outcome					
Discharge	110 (76.9%)	25 (17.5%)	37 (25.9%)	48 (33.6%)	0.010*
Death	33 (23.1%)	0 (0%)	13 (9.1%)	20 (14%)	

*significant p value ($P < 0.05$), [a]Chi square test

Table: 3 Association of demographic and clinical characteristics with the type of steroids.

Characteristics	n=143	Steroid			p-value
		Not used	Single[@]	Combine[$]	
Age (Years)					
<=50	37 (25.9%)	14 (9.8%)	13 (9.1%)	10 (7%)	0.001*
>50	106 (74.1%)	11 (7.7%)	65 (45.5%)	30 (21%)	
Gender					
Male	80 (55.9%)	12 (8.4%)	49 (34.3%)	19 (13.3%)	0.193
Female	63 (44.1%)	13 (9.1%)	29 (20.3%)	21 (14.7%)	
Ethnicity					
Sindhi	35 (24.5%)	9 (6.3%)	15 (10.5%)	11 (7.7%)	0.360
Urdu	82 (57.3%)	12 (8.4%)	47 (32.9%)	23 (16.1%)	
Punjabi	18 (12.6%)	2 (1.4%)	10 (7%)	6 (4.2%)	
Pathan	8 (5.6%)	2 (1.4%)	6 (4.2%)	0 (0%)	
Severity					
Asymptomatic	20 (14%)	20 (14%)	(0%)	0 (0%)	0.001*
Mild	11 (7.7%)	5 (3.5%)	5 (3.5%)	1 (0.7%)	
Moderate	35 (24.5%)	2 (1.4%)	26 (18.2%)	7 (4.9%)	
Severe	45 (31.5%)	0 (0%)	29 (20.3%)	16 (11.2%)	
Critical	32 (22.4%)	0 (0%)	17 (11.9%)	15 (10.5%)	
Hypertension					
Yes	83 (58%)	11 (7.7%)	49 34.3%)	23 (16.1%)	0.252
No	60 (42%)	14 (9.8%)	29 (20.3%)	17 (11.9%)	
Diabetes Mellitus					
Yes	71 (49.7%)	10 (7%)	40 (28%)	21 (14.7%)	0.564
No	72 (50.3%)	15 (10.5%)	38 (26.6%)	19 (13.3%)	
Fever					
Yes	90 (62.9%)	4 (2.8%)	59 (41.3%)	27 (18.9%)	0.001*
No	53 (37.1%)	21 (14.7%)	19 (13.3%)	13 (9.1%)	
Cough					
Yes	58 (40.6%)	3 (2.1%)	40 (28%)	15 (10.5%)	0.002*
No	85 (59.4%)	22 (15.4%)	38 (26.6%)	25 (17.5%)	
Dyspnea					
Yes	87 (60.8%)	0 (0%)	56 (39.2%)	31 (21.7%)	0.001*
No	56 (39.2%)	25 (17.5%)	22 (15.4%)	9 (6.3%)	
Outcome					
Discharge	110 (76.9%)	25 (17.5%)	61 (42.7%)	24 (16.5%)	0.001*
Death	33 (23.1%)	0 (0%)	17 (11.9%)	16 (11.2%)	

*significant p value ($P < 0.05$), [a]Chi square test, [@]single (only dexamethasone), [$]combine (dexamethasone with either methyl prednisolone or hydrocortisone)

IV. DISCUSSION:

The ability of corticosteroids to reduce inflammation is widely documented. Glucocorticoids have recently evolved into the gold standard of treatment for decreasing inflammation and controlling immunological reactions, particularly during the COVID-19 pandemic era. (14) However, COVID-19 patients are more vulnerable to the negative effects of steroids because of their inconsistent use. Front-line doctors frequently advise short-term glucocorticoid therapy with low to medium dosages with some favorable results among COVID-19 patients with severe clinical symptoms, despite the potential benefits and drawbacks of steroid use. (15) In this study, we looked into the relationship between steroid days and results, although the number of steroids utilized in our analysis was irrelevant. However, not all patients who met the requirements for oxygen therapy and extra severity criteria received corticosteroids. In patients with advanced age or several comorbidities, doctors may have been reluctant to give corticosteroids, especially if palliative care was the main focus of treatment. (16) But regardless of patient demographics, illness severity, or comorbidities, we discovered a significant correlation between the administration of corticosteroids and patients who were 50 years or older in the current study. This finding suggests that doing so may help patients avoid the complications of mechanical ventilation. Corticosteroids were also given to patients who were not recorded as having received supplemental oxygen or who did not have markers of severe COVID-19. (17) The rates of corticosteroid administration increased with markers of severity, such as high respiratory rate, low SpO2, high CRP, and increasing level of care. (18) The original clinical recommendations and the main takeaway from the RECOVERY trial advocated corticosteroids to everyone who needed more oxygen, despite the WHO severity requirements, and this takeaway may have stuck around as a straightforward decision-making tool. (19, 20)

In the current study, we found that patients who received the early steroid for more than 3 days were more likely to recover and be discharged. Also, we found that patients receiving only dexamethasone recovered early compared to a combination of steroids. This could be due to their quick anti-inflammatory and immunosuppressive impact. Clinically, the main justification for using glucocorticoids is that by limiting cytokine production, they may be helpful in preventing damage to structures, such as lung damage in the case of SARS-CoV-2. (21) The use of this medication to treat hyper-inflammatory conditions brought on by viral infections like influenza, respiratory syncytial virus (RSV), MERS, and, more recently, SARS-CoV-2 has been the subject of numerous investigations. (22) Further trials revealed that patients with RSV-induced lung infections responded favorably to low doses of dexamethasone. A similar amount of dexamethasone was also administered to patients with bronchiolitis, another RSV-related condition, and the outcomes were again found to be beneficial. (23) Zhong et al. recommended using a high dose of corticosteroids in SARS patients if they have been symptomatic for three days or longer and if medical investigation results point to progressive lung involvement since doing so will lower the likelihood of pulmonary fibrosis. (24) However, another study yielded results that were in agreement with Zhong et al. as it, too, indicated a decreased mortality among patients and a shorter hospital stay, despite the fact that it advocated for a low-to-moderate dose of corticosteroids in verified severe cases of SARS. (25) Additionally, it has been determined that modest doses of methylprednisolone taken for longer periods of time may be linked to a notable improvement in pulmonary outcomes and a reduction in the hospital stay. Between March 2013 and December 2018, a team of Spanish researchers conducted an RCT study with 277 patients; they discovered that early dexamethasone administration could shorten the duration of mechanical breathing and lower the overall death rate in patients with moderate-to-severe ARDS. (26) Another study found that giving patients with coronavirus-related pneumonia the recommended dose of corticosteroids considerably lowered their probability of dying (62% of 201 patients). (27)

Conclusion:

In the current study, we concluded that males of older ages are more likely to have CLVOD-19. Cough and fever is the most common symptom encountered while loss of taste and smell is the symptom of mild disease. Early steroid use and if used for more than 3 days during the hospital stay increased the chances of recovery and early discharge. Dexamethasone as a single use is more effective than the combination steroid use in terms of patient outcome.

Strengths and Limitations:

The current study is a good addition to the Pakistan literature that may be beneficial in the biased use of steroids in every patient admitted with COVID-19. Secondly, we highlighted the use of single and combination of steroid used. There are some limitations of the current survey. Some important ones are limited sample size and single-centered study, so results cannot be applied to the whole population as it needs to be validated by multi-centered large population-based studies. Side effects of steroids had not been taken into account and patients after discharge were not followed.

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CONFLICT OF INTEREST

The authors have no known conflicts of interest associated with the study.

ETHICS APPROVAL

Ethical approval was taken from the institutional approval from the Ethical review committee dated November 5th, 2020. (Reference code: 2650920SKPAT).

AUTHOR'S CONTRIBUTION

Dr. Santosh Kumar and Dr. Talat Mirza conceived the idea and designed and supervised the project. Dr. Ambrina Khatoon did the bioinformatics analysis and bench work along with Dr. Rizma Khan. Dr. Fouzia Shaikh co-supervised the project and did the proofreading and editing. Dr. Santosh Kumar conducted bench work and wrote the manuscript with statistical analysis.

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