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Efficacy of Methylprednisolone in Acute Respiratory Distress Syndrome- COVID-19 Middle Euphrates Patients

Zainab Azeez Manci[1] Saja Mohammed Kadhem [2] Saja Ali Hussein[3]

1 Babil Health Office , zaziz6746@gmail.com , Iraq ,babil.
2 Babil Health Office , sajam1986418@gmail.com ,Iraq ,babil.
3 Babil Health Office, drsajaalihussein86@gmail.com ,Iraq ,babil..
*Corresponding author email: samerali558555@gmail.com

فعالية المثيل بريدنزولون في متلازمة الجهاز التنفسي الحادة الناتجة من فايروس كورونا 19 المستجد لدى مرضى الفرات الاوسط

زينب عزيز منسي [1], سجا محمد كاظم [2], سجى علي حسين [3]

1 دائرة صحة بابل , zaziz6746@gmail.com, العراق , بابل .
2 دائرة صحة بابل , sajam1986418@gmail.com, العراق , بابل .
3دائرة صحة بابل , drsajaalihussein86@gmail.com, العراق , بابل.

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ABSTRACT

Background: The coronavirus disease 2019 was initially identified in Wuhan, the Chinese province of Hubei, in December 2019, and it quickly spread to other parts of the world.
Objective*:* To assess the efficacy of MP in ARDS COVID-19 patients who admitted to ICU.
Patients and Methods*:* Prospective cohort study, the data collection was among COVID 19 positive patients with severe acute respiratory syndrome attending the Intensive care unit One-hundred patients were included in this study: MP treated group included forty patients who exposed to high doses of MP 1 gm first day then 500 mg for other 4 days with standard treatment for COVID 19.Non MP treated group included sixty patients with standard care for COVID 19 alone.
Results:
A total of 100 patients with ARDS-COVID 19 positive were included in this study (40 MP treated and 60 non MP treated control group). The outcome for both group after 5 days has shown that; in exposed group: (27) 67.5 % of patients were improved, (7) 17.5 %of patients were worsen and (6) 15 %of patients died. In non MP treated group: 21.7 %of patients were improved, (40) 66.7 %of patients were worsen and(7) 11.7 %of patients were died and there were a significant association in the outcome and MP expose.
Conclusion:
In patients with ARDS COVID 19 positive, early administration of pulse dose of methylprednisolone was associated with remarkable improvement of general condition, vital signs and SPO2 ,and inflammatory markers .

Keywords: methylprednisolone, acute respiratory distress syndrome, coronavirus disease-19(COVID-19), transmission , corticosteroid.

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INTRODUCTION

The coronavirus disease 2019 (COVID-19) was initially identified in Wuhan, the Chinese city of Hubei, in December 2019, and it quickly spread to other parts of the world .As of 21 January 2021more than 96.8 million cases have been confirmed , with more than 2.07 million deaths[1].The genome of COVs consists of a single-strand ,positive-sense RNA of around 29.8kb nucleotides in length with a 5- cap structure and 3-poly A tail[2].

The transmission rate of COVs is very high, alarming infection to an average of 2-3 individuals getting affected from one infected individual. SARS-COV2 is primarily transmitted between people through direct , indirect ,or close contact with infected secretions such as respiratory (droplets and aerosols) which are expelled when an infected person coughs ,sneezes ,talk or sings[3,4].Risk of transmission increases where people are in close proximity (within 1-2meters) that the Respiratory droplets include viruses that can infect a person if they get them in their mouth, nose, or eyes. Variable SARS-CoV2 virus and/or RNA detected by RT-PCR can be found on surfaces for hours to days, depending on the type of surface and the ambient environment (temperature, humidity, etc.), Higher concentrations are especially found in medical facilities treating COVID-19 patients[5,6]. As a result, indirect transmission can also happen when a person touches a stethoscope, thermometer, or other item that has been contaminated with the virus by an infected person before contacting their mouth, nose, or eyes. Additional transmission methods, such as. urine, feces in some patients have been detected in few studies. However blood born transmission remains uncertain [7,8]. Although data are still limited, there is no proof of intrauterine COVID-19 transmission from infected pregnant mothers to fetus. A scientific brief on breastfeeding and COVID-19 was recently released by the World Health Organization. This brief explains that they have not identified any viable virus in breast milk in spite of Viral RNA fragments have been detected by RT-PCR in a small number of breast milk samples from infected moms. Therefore, the WHO advises that breastfeeding should be promoted for moms who are suspected or proven to be infected [9].

Asymptomatic individuals can potentially spread their infection to others (asymptomatic transmission). It is uncertain how widespread really asymptomatic infections is in the population, although studies indicate that children are less likely than adults to exhibit clinical signs. In summary, a live virus was isolated from a patient who did not exhibit any symptoms from mild to moderate sickness up to 8–9 days after the onset of symptoms, and from patients who were critically ill for a longer period of time [10].

The illness signs and symptoms ranged from mild to severe manifestation as ARDS is depends on the patient age, genetic factors, and immune system function.

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Adults with COVID-19 infection can be grouped into the following severity of illness categories: Asymptomatic or pre symptomatic infection: The individual has no symptoms but test positive for COVID-19 using virological test .Mild illness: The individual have any of various signs and symptoms of COVID-19(fever ,cough ,sore throat ,malaise ,headache ,muscle pain ,nausea ,vomiting ,diarrhea ,loss of test and smell)but not have shortness of breath and no abnormal chest imaging.Moderate illness: The individual who show evidence of lower respiratory tract disease during clinical assessment or imaging but saturated oxygen remains more than 94% on room air at sea level.Severe illness: The individual who have saturated oxygen less than 94% on room air at sea level ,ratio of PaO2/FiO2 less than 300 mmhg ,respiratory rate more than 30 cycle/min. ,or lung involvement more than 50%.Critical illness: The individual who have respiratory failure, septic shock, and/or multi organ failure [11,12].The majority of COVID-19 cases were(80.9%) with mild symptoms, followed by severe (13.8%), and critical (4.7%). 2.3% for the general population and 0.3% for healthcare professionals. For serious patients, the case mortality rate exceeds 49.0%.The mortality rate was significantly greater for patients with underlying disorders than for those without (10.1%) for cardiovascular diseases, 7.3% for diabetes mellitus, 6.3% for chronic respiratory diseases, 6% for hypertension, and 5.6% for cancer [13]. The majority of critically ill patients experienced organ failure; 67% had ARDS, 29% had AKI, 23% had cardiac damage, 29% had liver dysfunction, and 2% had pneumothorax [14].

Diagnosis of COVID-19 made by several molecular diagnostic tests such as Real Time-PCR, viral genome sequencing, serological assays(ELISA), radiological by CXR and CT scan of chest. Recently, new ELISA kits were approved (Roche), also several quick tests for detection of IgM and IgG, but they were not extensively validated, and the results are not reliable,And to assess severity depend on other investigation e.g. S. ferritin, CRP, LDH, D. Dimer, ABG. Also CBC, ESR, LFT, RFT, RBS, and IL6 level other important investigation.RT-PCR (sample collected for test from swab of nose or the back of throat, aspirated fluid from lower respiratory tract), and the test results are: positive if both genes are found,negative if no gene found, inconclusive if only one gene is found[15].

CT –Visual quantitate evaluation depends on the amount of involvement in each lobe and the whole lung (total Severity Score (TSS) that was reported .The percentage of of lobar involvement in each of the five lung lobes was determined and categorized as follows:Non (0%),Minimal (1-25%),Mild (26-50%),Moderate (51-75%),severe (76-100%).Each lobe had a corresponding score of 0, 1, 2, 3, 4, and 5. The TSS was calculated by adding the five lobe scores, which ranged from 0 to 20, and the final score for each patient was determined by a thoracic radiology expert. Bilateral GGO with peripheral or posterior distribution, primarily in the lower lobes and less commonly in the middle lobe, is one of the initial CT findings in COVID-19 patients. Less often occurring and mostly seen in the latter stages of the illness include bronchiectasis, sub-pleural involvement, pleural thickening, and septal thickening.

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Pneumothorax, pleural effusion, and cavitation are rare but potential signs that may appear as the illness advances[16] .

The primary cause of mortality for COVID-19 patients is ARDS. While there are currently no effective particular therapy agents for the illness, CS, an immunosuppressive medication, can lessen and avoid the onset of ARDS and cytokine storm. Numerous studies have demonstrated that the pathological features of COVID-19 pneumonia highly like those of Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). These features include bilateral diffuse alveolar damage with cellular fibromyxoid exudates, pneumocyte desquamation, and the formation of hyaline membranes, which indicate acute severe respiratory failure [17]. Additionally, COVID-19 individuals had microvascular thrombosis and hemorrhage with micro-angiopathy in their lungs' tiny capillaries and arteries, which were a major factor in their death, Although corticosteroid therapy is not usually advised for COVID-19 patients, it may be used to avoid the development of severe respiratory failure in severe individuals because of pulmonary edema (non-cardiogenic) and hyaline formation[18]. Because MP has good pharmacological effects on the control of excessive and dysfunctional systemic inflammation, they are frequently utilized to prevent lung damage caused by severe community-acquired pneumonia [19].

For severe ARDS patients, salvage MP refers to rescue therapy intended to lessen pulmonary fibrosis and stop further pathological deterioration. This definition helps to explain why some patients benefit from corticosteroid medication during rescue [20].

When MP is used during the ARDS phase, it can effectively suppress a violent inflammatory storm and by crucial time for infection management, preventing additional multiorgan damage, and preventing shock. This suggests that MP, when paired with other rigorous therapy, has synergistic biological benefits on individuals with severe or fatal NCP. It is generally known that CS are helpful in the treatment of ARDS as they can reduce inflammatory response and postpone fibrosis, even if the use of CS in this regard is still controversial [21]. When MP was used in proven critical SARS patients, hospitalization and fatality rates were decreased. Significant secondary lower respiratory infections or other problems were not linked to the use of MP [22].

Lastly, CS seem to be a double- edged sword in the fight against COVID-19 and need to be judiciously, considering the risk-benefit ratio, that the pro thrombotic influence of steroid and other drug reactions, might have contributed to increase mortality. To assess the efficacy of methylprednisolone in ARDS- COVID-19 Middle Euphrates patients who admitted to ICU.

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PATIENTS AND METHODS

Prospective cohort study was conducted between April and December of 2020 among patients who had COVID 19 positive with severe acute respiratory syndrome attending the Intensive care unit in Al-Sadr teaching hospital in Al Najaf city center &Marjan teaching hospital / Iraq.

Approvals of the scientific committee in the department of medicine in the Arab Board for Health Specialization and Al- Sadr teaching hospital were taken . The purpose of study was explained to participants to get their written consent.A consecutive sample of patients who had COVID 19 positive with severe acute respiratory syndrome during the time frame of data collection was adopted .Sample size of one-hundred patients was included in this study and the reason for this sample size is the seriousness of disease :MP treated group included forty patients who exposed to high doses of MP for five days in addition to standard treatment for COVID 19,Non MP group of sixty patients receiving standard therapy for COVID-19 alone will be chosen from contemporaneous consecutive COVID-19 cases; this group will be blinded to outcome data and will be subject to the same inclusion and exclusion criteria. We included patients with history of ARDS COVID 19 +ve, who diagnosed on baseline investigation included PCR, chest CT, ABG, CBC, CRP, S. Ferritin, LDH and D-dimer ,Age between ≥18 years and ≤80 years, admitted in the intensive care unit wards, abled to verbal consent. we excluded all patients with history of heart failure and malignancy and long-term oxygen therapy , long-term steroid use, Pregnancy, immune suppressor disease and tocilizumab use, uncontrolled DM.

The information was taken through specific questionnaire developed for this study. The exposed group were selected from concurrent consecutive COVID-19 patients with ARDS and management with 1 g/day of IV MP in 250 cc normal saline during 3 hours in first day then continue giving 500 mg/day of IV MP in 250 cc normal saline during 3 hours for subsequent four days .The usual standard of care for both groups was: Empiric antibiotic therapy, mechanical ventilation (noninvasive),pronation when possible, other treatments which can be used are: antivirals, vitamins and anticoagulants allowed in each study group.

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The dependent variable for this study was the outcome after 5 days which improved, worsen or died. The independent variables of this study comprised age, gender, medical history, smoking history, baseline general condition that included respiratory rate, pulse rate, systolic and diastolic blood pressure, CRP, SPO2 and serum ferritin all measure at baseline and after 5 day.

Statistical analysis: The statistical package for the social sciences (SPSS version 23) was the computer tool used to analyze the data. Frequency tables were used to display descriptive statistics, mean ± standard deviation was used to describe continuous variables, and numbers and percentages were used to represent categorical data. Analytical statistics such as the chi-square test is used to determine the relationship between two categorical variables, while the Student- t test and ANOVA test are used to determine the relationship between category data and continuous variables. A P-value of less than or equivalent to 0.05 was statistically significant.

LIMITATION OF STUDY

A relatively limited number of patients due to seriousness of disease, Further investigations can't be done (such as IL-6 level) and re-evaluated of some investigations due to unavailability in the hospital. Unfortunately, the study can't assesse viral load data and changing with course of treatment.

RESULTS AND DISCUSSION

A total of 100 patients with ARDS-COVID 19 positive were included in this study (40 MP treated exposed and 60 non-exposed to MP control group). The mean±SD age in MP expose group was 47.9±14.7 years and the mean±SD age in non-expose group was 49.7±14.8 years and the two samples were homogenous in term of age, gender, medical history (hypertension, diabetes mellitus, ischemic heart disease) and smoking history.

In exposed group, there were a significant decrease in the mean respiratory rate, pulse rate, CRP and S. ferritin ($p \leq 0.05$) while there was a significant increase in the mean systolic blood pressure, diastolic blood pressure and SPO2 ($p \leq 0.05$) after 5 days treatment, table 3-1.

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Table 3-1 The difference in Vital sign and biochemical test between baseline and after 5 day of MP treatment in exposed group.

Variables		Mean±SD	P value
Respiratory rate	Baseline	37.7±3.1	<0.001*
	After 5 day	27.2±6.4	
Pulse rate	Baseline	115.2±22.3	0.031*
	After 5 day	105.3±13.8	
Systolic blood pressure	Baseline	106.4±14.5	0.033*
	After 5 day	114.1±14.3	
Diastolic blood pressure	Baseline	59.4±12.7	0.001*
	After 5 day	69.4±9.8	
SPO2	Baseline	69±8.3	<0.001*
	After 5 day	88±11.3	
CRP	Baseline	104.5±32.3	<0.001*
	After 5 day	50.3±33.6	
Serum ferritin	Baseline	940.2±394.6	<0.001*
	After 5 day	445.3±296.6	

* Student T test, Significant ≤0.05

The Baseline Vital sign and biochemical test for two group has shown that: the mean Respiratory rate(RR) for MP exposed group was significantly higher than non-exposed group ($p<0.001$), The mean pulse rate (PR) for MP exposed group was significantly higher than the mean for non-exposed group($p<0.001$), the mean Systolic blood pressure was lower in MP exposed group than non-exposed group but that difference was non-significant ($p=0.054$), the baseline diastolic blood pressure was significantly lower in MP exposed group than non-exposed group (0.001), also the baseline SPO2 was significantly lower in MP exposed group than non-exposed group($p<0.001$), the baseline CRP and serum ferritin were significantly higher in MP exposed group than non-exposed group ($p\leq0.05$), table 3-2.

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Table 3-2 Baseline Vital sign and biochemical test difference between two groups

P value	Mean±SD	Participants	Variables
<0.001*	37.7±3.02	MP exposed group	Respiratory rate
	30.3±3.9	Non exposed group	
<0.001*	117.5±22	MP exposed group	Pulse rate
	100.3±14.4	Non exposed group	
0.054*	107.2±15	MP exposed group	Systolic blood pressure
	114±18.3	Non exposed group	
0.001*	59.5±13.1	MP exposed group	Diastolic blood pressure
	68.6±12	Non exposed group	
<0.001*	67.3±8.7	MP exposed group	SPO2
	81.6±8.9	Non exposed group	
0.001*	105.5±32.9	MP exposed group	CRP
	80.1±35.7	Non exposed group	
<0.001*	993.8±424.6	MP exposed group	Serum ferritin
	616.7±317.5	Non exposed group	

* Student T test, Significant ≤0.05.

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Table 3-3 Demographic characters and medical and smoking history distribution in MP expose and non-expose group.

Variables		Patients		P value
		MP expose group	Non-expose group	
Age	18-39 years	14(35%)	19(31.7%)	0.89*
	40-60 years	17(42.5%)	22(36.7%)	
	>60 years	9(22.5%)	19(31.7%)	
Gender	Female	19(47.5%)	23(38.3%)	0.36*
	Male	21(52.5%)	37(61.7%)	
Medical history	-ve	29(72.5%)	42(70%)	0.78*
	+ve	11(27.5%)	18(30%)	
Smoking history	Never smoke	26(65%)	39(65%)	0.78*
	Ex-smoker	2(5%)	5(8.35)	
	Current smoker	12(30%)	16(26.7%)	
Total		40 (100%)	60(100%)	100

*chi-square test, Significant ≤0.05.

The smoking history in two groups was shown in figure 3-1. Where 65 % of both groups were never smoke.

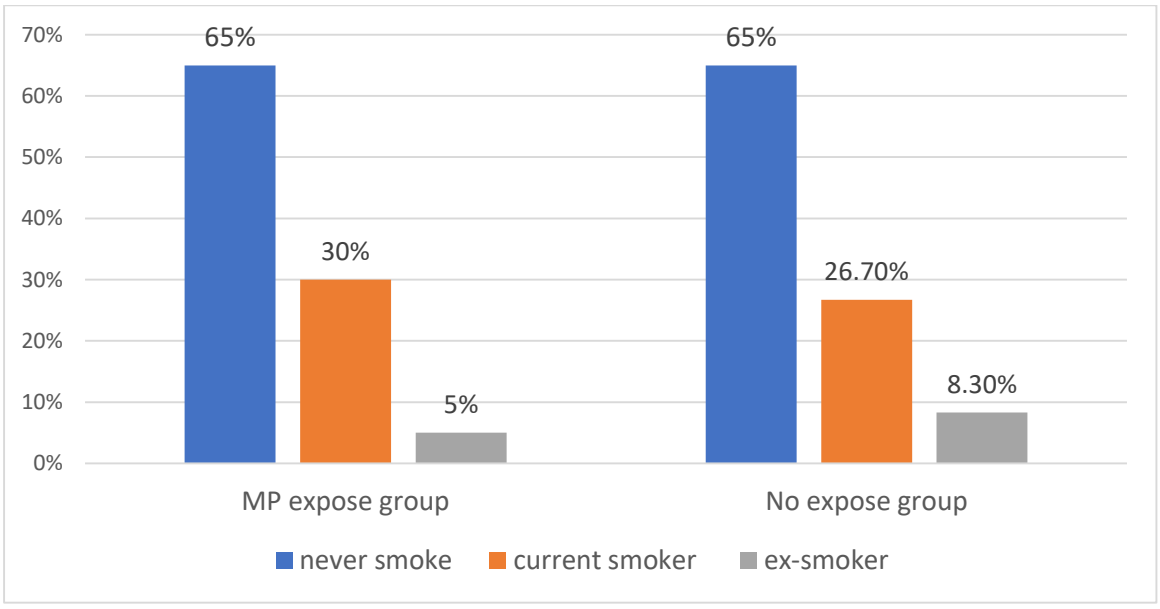

Figure 3-1 Smoking history among both groups.

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The outcome for both group after 5 days has shown that; in exposed group: (27) 67.5% of patients were improved, (7) 17.5% of patients were worsen and 15% (6) of patients died. In non-exposed group: (13) 21.7% of patients were improved, (40) 66.7% of patients were worsen and(7) 11.7% of patients were died and there were a significant association in the outcome and MP expose, table 3-4, figure 3-2, figure 3-4.

Table 3-4 Outcome in both MP exposed and non exposed group.

Variable		Patients		P value
		MP exposed group	Non-exposed group	
Outcome after 5 day	Improved	27(67.5%)	13(21.7%)	<0.001*
	Worsen	7(17.5%)	40(66.7%)	
	Died	6(15%)	7(11.7%)	
Total		40	60	100

*chi-square test, Significant ≤0.05.

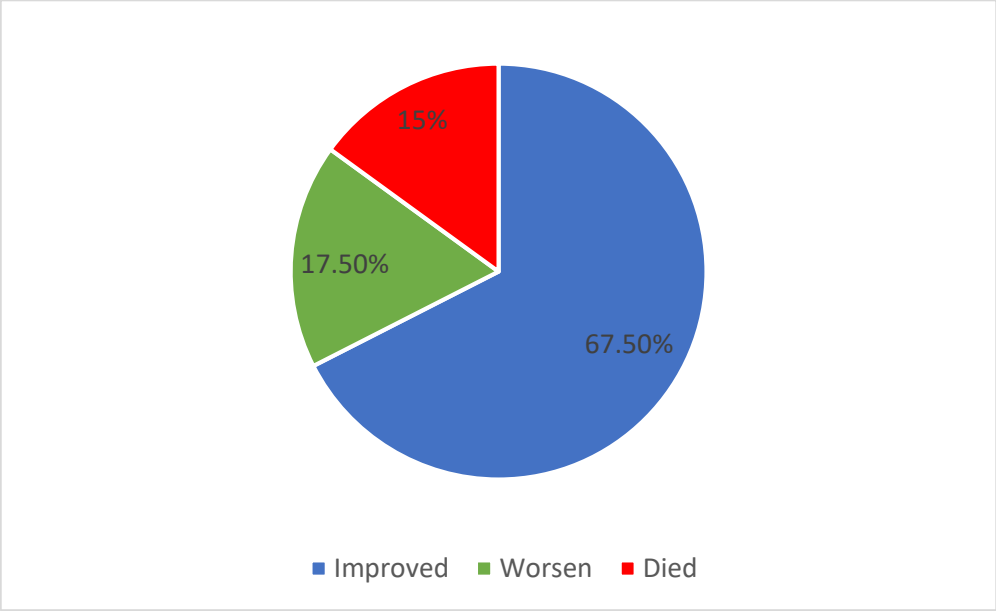

Figure 3-2 Outcome in MP exposed group.

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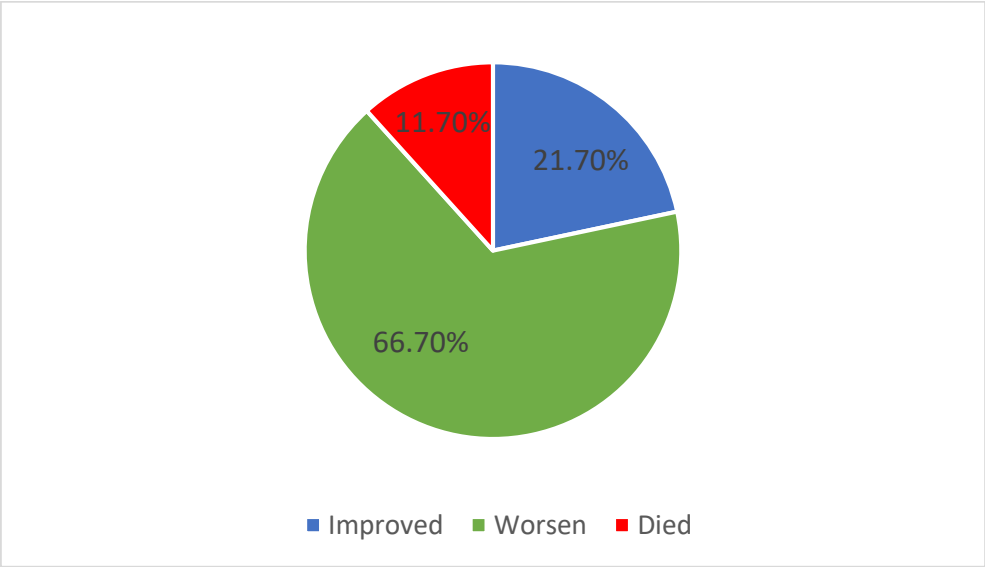

Figure 3-3 Outcome of non-exposed group.

In exposed group, the mean ±SD time at MP giving has shown a significant difference between the outcome (p=<0.001), where the mean ±SD time at MP giving in improved patients was the lower (3.5 ±2 days), the mean ±SD time at MP giving in worsen patients was 8± 3.1 days, while the mean ±SD time at MP giving in dying patients was 13.1± 2.5 days, table 3-5, figure 3-4.

Table 3-5 The difference in the meantime at MP giving according to outcome.

Variable		Mean±SD time at MP giving	P value
Outcome after 5 day	Improved	3.5 ±2 days	<0.001*
	Worsen	8± 3.1 days	
	Died	13.1± 2.5 days	

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* ANOVA test, Significant ≤0.05.

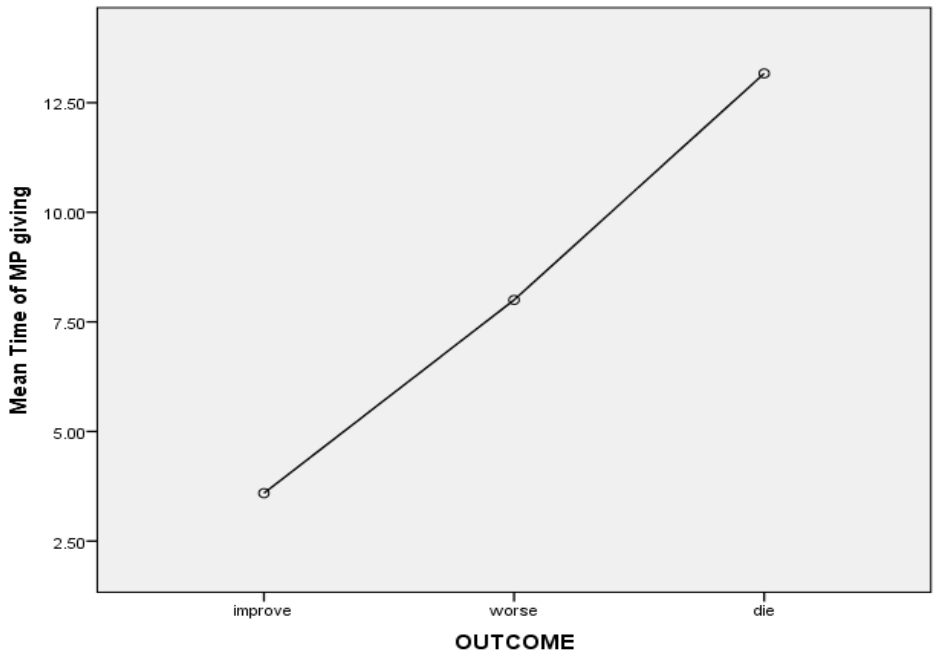

Figure3-4 The difference in the meantime at MP giving according to outcome.

In actual practice, patients with ARDS COVID-19 frequently get corticosteroids; nevertheless, there is still some debate on the effectiveness of MP medication. In theory, early corticosteroid treatment might lessen inflammatory response and stop COVID-19 from spreading. However, there are still a lot of unsolved concerns about the use of corticosteroids to treat COVID-19, including their effectiveness, when to start, and how much to take.

In the present study, both groups were comparable in their age, gender, medical history and smoking history, in order to avoid possible bias caused by effect of those variables on patient's outcome.

According to this study and previous researches, MP hospitalized to the intensive care unit outlined a case series of 15 COVID-19 patients hospitalized to the intensive care unit (ICU) who were treated with corticosteroids for cytokine release syndrome[23]. The study discovered a strong clinical and biochemical correlation between corticosteroid therapy and better outcome additionally, it has been shown that giving COVID-19 patients with severe pneumonia an intravenous methylprednisolone dosage of 1-2 mg/kg/dose every 6 hours for 5-7 days was linked to a quicker improvement in clinical symptoms, an increase in SpO2, and a greater degree of absorption in the chest CT[24], this improvement may be related to fact that patients with severe COVID-19 may have cytokine storm syndrome[25], which is a condition frequently related to lung involvement (including ARDS) and multi-organ failure[26] . In order to induce immunosuppression to antagonize virally driven hyper inflammation ,In these patients, a therapeutic role can also be

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hypothesized for corticosteroids. While in other two studies reported negative findings regarding the use of corticosteroids in patients with COVID-19. In another study showed the group treated with corticosteroids experience a doubled risk of being admitted to an ICU[27]. while in other study [28], the duration of viral RNA for oropharyngeal swabs and feces was almost doubled in corticosteroids group than controls. a study [29]did not report any benefit of the use of intravenous methylprednisolone (30–80 mg/day) on clinical outcomes (i.e., short-term disease progression) in 137 participants, the data of those studies were based only on retrospective findings also genetic background of Chinese people may modify the results found in our work.

Also there were dramatically and significantly improved in RR, PR, BP, SPO2, CRP and serum ferritin after The injection of MP reduced the requirement for mechanical ventilation even though the non-exposed group's baseline vital signs and biochemical test results were better than those of the MP-exposed group. Our results corroborated recent research on the use of corticosteroids in the treatment of severe COVID-19 patients showed methylprednisolone pulse significantly improves patients' clinical status, including their GCS and SpO2[30]. It also discovered that the radiographic presentation of the chest was similar to interstitial lupus pneumonitis, a rare and extremely fatal form of systemic lupus erythematosus [31],and the identification of parenchymal consolidation and widespread fibrotic alterations in the patient's chest radiographs, which were comparable to radiographic characteristics of lupus pneumonitis [32],[33] .in light of the immunological origin of lupus pneumonitis, it has been hypothesized that immunological processes may play a role in the pathogenesis of COVID-19 lung injury. Immunosuppressive treatment may also help patients' conditions, as evidenced by the removal of patchy ground glass from patients' chest CT scans after starting methylprednisolone. Numerous earlier research noted that symptoms would worsen 5-7 days after the disease started[34], Controlling the inflammatory response and cytokine storm is crucial during this phase of the disease. Nicola Veronese concluded from the systematic review that routine corticosteroid use in COVID-19 cannot be encouraged, but that methylprednisolone therapy may reduce the mortality rate in more severe forms of the disease, such as severe respiratory failure[34].

Therefore, in this study, we began employing high dosage steroid pulse treatment with 1000 mg of methylprednisolone sodium succinate on the first day and continued at 500 mg/d for the next four days, based on the premise that an immune-mediated event would occur in severe instances. Additionally, Mc Gonagle et al. demonstrated that COVID-19 patients' lung pathology exhibits severe interstitial and alveolar inflammation[35] .It was previously thought that lung harm from COVID-19 not only due to direct viral injury but also triggered an immunological response that resulted in the activation of immune cells and a cytokine storm[36]. Vascular endothelium and alveolar epithelium are severely

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damaged by cytokine storm, which raise vascular permeability and cause pulmonary edema and hyaline development [37],[38].

Also we recognized that, as early as start methylprednisolone drug as the improvement incidence increases, this in line with study that reported; timely and wise use of Corticosteroids resulted in benefit to individuals with severe COVID-19[39].

While according to other studies corticosteroids may have a detrimental influence on the healing of lung damage in cases with non-severe COVID-19 pneumonia, as per the research cited later Early, low-dose, short-term corticosteroid therapy was linked to worse clinical outcomes among adult patients with non-severe COVID-19 pneumonia; more patients in the corticosteroid group developed severe disease (12.7% vs. 1.8%, p = 0.028) than in the non-corticosteroid group [40]. A patient with COVID-19 was treated with methylprednisolone from day 8 of the illness, his condition deteriorated, he had respiratory failure, and on day 14, he passed away[17], A meta-analysis consists of 5270 patients from 15 studies revealed that the administration of corticosteroids was linked to increased mortality (RR = 2.11, 95% CI = 1.13–3.94, p = 0.019), extended hospital stays, and a greater incidence of bacterial infection (RR = 2.08, 95% CI = 1.54–2.81, p < 0.001) among COVID-19 patients [41]. In another study showed that the group receiving corticosteroids had a higher percentage of patients with non-severe COVID-19 pneumonia who progressed to severe illness (11.4% vs. 2.9%, p = 0.353) than the group not receiving corticosteroids [42].

Primary studies were unable to support the use of corticosteroids for COVID-19 patients, However, new studies, including our data, indicates that corticosteroid treatment in severe COVID-19 patients would improve the clinical outcome of patients.

CONCLUSIONS

In this study, assessed the I.V. MP has an effect on the treatment of patients with ARDS COVD 19 positive, early administration of pulse dose of MP was associated with remarkably improvement of general condition, vital signs and SPO2 ,and inflammatory markers such as CRP, S. ferritin after 5 days of MP administration .

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Conflict of interests.

There is no conflict interest

References

1. C. Wang, P.W. Horby, F.G. Hayden, G.F. Gao." A novel coronavirus outbreak of global health concern", *The lancet*,vol.395,no.10223,pp. 470-3. 2020.
2. Y. Chen, Q. Liu, D. Guo."Emerging coronaviruses: genome structure, replication, and pathogenesis", *Journal of medical virology*,vol.92,no.4,pp. 418-23.2020.
3. J. Liu, X. Liao, S. Qian, J. Yuan, F. Wang, Y. Liu, et al. "Community transmission of severe acute respiratory syndrome coronavirus 2, Shenzhen, China, 2020". *Emerging infectious diseases,*vol.26,no.6,pp. 1320-1323.2020.
4. Q. Bi, Y .Wu, S. Mei, C Ye, X. Zou,Z. Zhang, X. Liu, L. Wei, S.A.Truelove, T.Zhang, W.Gao, C.Cheng, X.Tang, X.Wu, Y.Wu, B.Sun, S.Huang,Y. Sun,J. Zhang, T. Ma , J. Lessler,T. Feng. "Epidemiology and transmission of COVID-19 in 391 cases and 1286 of their close contacts in Shenzhen, China: a retrospective cohort study". *Lancet Infect Dis*.,vol. 20,no8, pp.911-919,Aug. ,2020
5. N. Van Doremalen, T. Bushmaker, D.H. Morris, M.G. Holbrook, A. Gamble, B.N. Williamson, et al. "Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1",*New England journal of medicine*,vol. 382,no.16,pp. 1564-1567, 2020
6. P.Y. Chia, K.K. Coleman, K.K. Tan, S. Ong, M. Gum, S.K. Lau, et al. "Detection of air and surface contamination by SARS-CoV-2 in hospital rooms of infected patients". *Nature communications,vol.*11,no.1,pp. 1-7,2020.
7. W.j. Guan, Z. Ni, Y.Hu, W. Liang, C. Ou, J. He, et al. "Clinical characteristics of coronavirus disease 2019 in China", *New England journal of medicine*,vol. 382,no. 18,pp.1708-20,2020.
8. S.Zheng, J. Fan, F. Yu, B. Feng, B. Lou, Q. Zou, et al. "Viral load dynamics and disease severity in patients infected with SARS-CoV-2 in Zhejiang province, China, January-March 2020: retrospective cohort study". *Bmj*. vol.21,no369,2020;
9. C.G. Perrine, KV Chiang, EH Anstey, DA Grossniklaus, EO Boundy, EK Sauber-Schatz, et al. "Implementation of Hospital Practices Supportive of Breastfeeding in the Context of COVID-19—United States, July 15–August 20, 2020", *Morbidity and Mortality Weekly Report*,vol.69,no.47,pp. 1767-1770 ,2020
10. N.G. Davies, P. Klepac, Y. Liu, K. Prem, M Jit, RM Eggo,"Age-dependent effects in the transmission and control of COVID-19 epidemics",*Nature medicine,vol.26,no.8,pp.* 1205-11,2020.
11. C. Tan, Y Huang, F. Shi, K. Tan, Q. Ma, Y. Chen, et al." C-reactive protein correlates with computed tomographic findings and predicts severe COVID-19 early". *Journal of medical virology,*vol.92,no.7,pp. 856-62, 2020.
12. J. Casas-Rojo, J. Antón-Santos, J. Millán-Núñez-Cortés, C. Lumbreras-Bermejo, J . Ramos-Rincón, E. Roy-Vallejo, et al. "Clinical characteristics of patients hospitalized with COVID-19 in Spain: Results from the SEMI-COVID-19 Registry". *Revista Clínica Española (English Edition)*,vol.220,no.8,pp. 480-94, 2020.

13. Y. Zhang,The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. "The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China". *Zhonghua Liu Xing Bing Xue Za Zhi*,41,no.2,pp. 145-51,2020
14. X. Yang, Y.Yu,J. Xu, H. Shu, H. Liu, Y. Wu, et al." Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study", *The Lancet Respiratory Medicin,*vol.8,no.5,pp.475-81,2020.
15. B. Gates." Responding to Covid-19—a once-in-a-century pandemic?" ,*New England Journal of Medicine*,vol.382,no.18,pp. 1677-9,2020
16. S. Salehi, A. Abedi, S. Balakrishnan," A Gholamrezanezhad. Coronavirus disease 2019 (COVID-19): a systematic review of imaging findings in 919 patients". *American Journal of Roentgenology*,vol.215,no.1,pp. 87-93, 2020.
17. Z. Xu, L. Shi, Y. Wang, J. Zhang, L. Huang, C. Zhang, et al. "Pathological findings of COVID-19 associated with acute respiratory distress syndrome". *The Lancet respiratory medicine*,vol.8,no.4,pp. 420-2, 2020.
18. S.E.Fox, A. Akmatbekov, J.L. Harbert, G. Li, J.Q. Brown, R.S. Vander Heide. "Pulmonary and cardiac pathology in African American patients with COVID-19: an autopsy series from New Orleans", *The Lancet Respiratory Medicine*,vol.8,no.7,pp. 681-6, 2020.
19. L. Chen, J. Chen, Y. Chen, C. Wu, X. Yang. "Efficacy and safety of glucocorticoids in the treatment of community-acquired pneumonia: a meta-analysis of randomized controlled trials", *World journal of emergency medicine*,vol.6,no.3,pp.172, 2015.
20. W.L. Biffl, F.A. Moore, E.E. Moore, J.B. Haenel, J.r. Mclntyre, J.M. Burch. "Are corticosteroids salvage therapy for refractory acute respiratory distress syndrome? *",The American journal of surgery,vo*l.170, no.6,pp 591-596.1995;
21. J. Leap, J Hill, K. Patel, A. Shah, T. Dumont. "Paralytics, sedation, and steroids in acute respiratory distress syndrome", *Critical care nursing quarterly*,vol.42,no.4,pp. 376-91 ,2019
22. R. Chen, X. Tang, S. Tan, B. Liang, Z. Wan, J. Fang, et al. "Treatment of severe acute respiratory syndrome with glucosteroids: the Guangzhou experience", *Chest.* ,vol.129,no.6,pp. 1441-52,2006.
23. S.S. Yang, J. Lipes," Corticosteroids for critically ill COVID-19 patients with cytokine release syndrome: a limited case series". *Canadian Journal of Anesthesia/Journal canadien d'anesthésie*,vol.67,no.1,pp. 1462-4, 2020.
24. Y. Wang, W. Jiang, Q. He, C. Wang, B. Wang, P. Zhou, et al. "Early, low-dose and short-term application of corticosteroid treatment in patients with severe COVID-19 pneumonia: single-center experience from Wuhan, China". *MedRxiv*. 2020.
25. C. Huang, Y. Wang, X. Li, L. Ren, J. Zhao, Y. Hu, et al." Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China",*The lancet,*vol.395,no. 10223,pp. 497-506.2020,
26. A. Seguin, L. Galicier, D. Boutboul, V. Lemiale, E. Azoulay." Pulmonary involvement in patients with hemophagocytic lymphohistiocytosis", *Chest*,vol.149,no.5,pp. 1294-301, 2016

ISSN: 2312-8135 | Print ISSN: 1992-0652
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27. D. Wang, B. Hu, C. Hu, F. Zhu, X. Liu, J. Zhang, et al. "Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan", China. *Jama*,vol.323,no11,pp.1061-9 ,2020
28. Y. Ling,S. Xu, Y. Lin, D. Tian, Z. Zhu, F. Dai, et al." Persistence and clearance of viral RNA in 2019 novel coronavirus disease rehabilitation patients". *Chinese medical journal*,vol.133,no. 9,pp. 1039-1043. 2020.
29. K. Liu, Y. Fang, Y. Deng, W. Liu, M. Wang, J. Ma, et al. Clinical characteristics of novel coronavirus cases in tertiary hospitals in Hubei Province, *Chinese medical journal*,vol.133,no. 9,pp.1025-1031 ,2020.
30. R.H. Farahani, R. Mosaed, A. Nezami-Asl, S. Soleiman-Meigooni, S. Kalantar, E.S. Malekabad, et al. "Evaluation of the efficacy of methylprednisolone pulse therapy in treatment of covid-19 adult patients with severe respiratory failure: randomized", *clinical trial,*sep.2020.
31. J.B.Orens, F.J. Martinez, J. Lynch 3rd." Pleuropulmonary manifestations of systemic lupus erythematosus",*Rheumatic diseases clinics of North America*,vol.20,no.1,pp.159-93,1994
32. M.C.Chen, Y.L. Wu, K.L. Lee, K.S Lai, C.L. Chung." Lupus pneumonitis presenting with high titre of anti-Ro antibody". *Respirology case reports*,vol.6,no.1,pp. 280,2018.
33. T.ŞEyüboğlu, A.T. Aslan, Y. Özdemir, D.G. Yıldırım, N. Buyan, Ö. Boyunağa,"Isolated acute lupus pneumonitis as the initial presentation of systemic lupus erythematosus in an 8-year-old girl". *Autoimmunity Highlights*,vol.9,no.1,pp.1-4, 2018.
34. W. Guan, Z. Ni, Y. Hu, W. Liang, C. Ou, J. He, et al. "Clinical characteristics of 2019 novel coronavirus infection in China". *MedRxiv*. 2020.
35. D. McGonagle, J. O'Donnell, K. Sharif, P. Emery, C. Bridgewood." Immune mechanisms of pulmonary intravascular coagulopathy in COVID-19 pneumonia". *The Lancet Rheumatology*. vol.2,no.7,pp.437-445 ,2020.
36. F. Coperchini, L. Chiovato, L. Croce, F. Magri, M. Rotondi. "The cytokine storm in COVID-19: An overview of the involvement of the chemokine/chemokine-receptor system". *Cytokine & growth factor reviews*, vol.53 ,no.25,pp.32, 2020
37. J. Wong, J. Leong, J. Lee, S. Albani, J. Yeo." Insights into the immuno-pathogenesis of acute respiratory distress syndrome". *Annals of translational medicine*,vol. 7,no.19,pp.504,2019
38. R. Channappanavar, S. Perlman, "Pathogenic human coronavirus infections: causes and consequences of cytokine storm and immunopathology". *Semin immunopathology,* vol.39,no.5,pp.529-539, 2017
39. S. Goursaud, R. Descamps, C. Daubin, D. du Cheyron, X. Valette, "Corticosteroid use in selected patients with severe acute respiratory distress syndrome related to COVID-19",*Journal of Infection*,vol.81,no. 2,pp.89-90 ,2020.
40. Q. Li, W. Li, Y Jin, W. Xu, C. Huang, L. Li, et al." Efficacy evaluation of early, low-dose, short-term corticosteroids in adults hospitalized with non-severe COVID-19 pneumonia: a retrospective cohort study". *Infectious diseases and therapy*,vol.9,no.4,pp. 823-836. 2020.

ISSN: 2312-8135 | Print ISSN: 1992-0652
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41. Z. Yang, J. Liu, Y. Zhou, X. Zhao, Q. Zhao, J. Liu. "The effect of corticosteroid treatment on patients with coronavirus infection: a systematic review and meta-analysis". *Journal of Infection,*vol.80,no.1,pp.13-20,2020.
42. M. Yuan, X. Xu, D. Xia, Z. Tao, W. Yin, W. Tan, et al." Effects of corticosteroid treatment for non-severe COVID-19 pneumonia: a propensity score-based analysis". *Shock,* vol.54,no.5,pp. 638-43 , 2020.

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الخلاصة

المقدمة: في ديسمبر 2019، تم الإبلاغ عن مرض فيروس كورونا 2019 لأول مرة في ووهان، عاصمة اقليم هوبي، الصين، والذي انتشر بسرعة إلى بقية العالم. تقييم فعالية عقار ميثيل بريدنيزولون في مرضى متلازمه الجهاز التنفسي الحادة للمصابين بفايروس كورونا المستجد الذين تم ادخالهم وحدة العناية المركزة.

المرضى والطرق: دراسة جماعية مستقبلية، تم جمع البيانات 2020 بين المرضى الذين أصيبوا بفيروس كورونا المستجد المصابين بمتلازمة الضائقة التنفسية الحادة الذين تم ادخالهم إلى وحدة العناية المركزة. تضمنت هذه الدراسة مئة مريض: المجموعة المعرضة لعقار المثيل بريدنزولون تضمنت اربعين مريضا بجرعة 1غم في اليوم الاول ثم 500مغم لمدة اربعة ايام بالاضافة الى العلاج القياسي لفيروس كورونا بينما المجموعة الثانية تضمنت ستين مريضا تم علاجهم بالعلاج القياسي فقط لفايروس كورونا.

النتائج: تم تضمين مجموعة 100 مريض مصاب بمتلازمة الضائقة التنفسية الحادة – لمرضى فايروس كورونا المستجد في هذه الدراسة (40 مريض تعرضوا لعلاج المثيل بريدنزولون و 60 لم يتعرضوا لمجموعة التحكم). أظهرت النتيجة لكلا المجموعتين بعد 5 أيام أن؛ في المجموعة المعرضة: تم تحسين 67.5٪ (27) من المرضى ، وتفاقم 17.5٪ (7) من المرضى وتوفي 15٪ (6) من المرضى. في المجموعة غير المعرضة: تم تحسين 21.7٪ (13) من المرضى ، وتفاقم 66.7٪ (40) من المرضى ، وتوفي 11.7٪ (7) من المرضى.

ألاستنتاج: ارتبط الإعطاء المبكر لجرعة النبض من ميثيل بريدنزولون بتحسن ملحوظ في الحالة العامة والعلامات الحيوية و نسبه الاوكسجين، وعلامات الالتهاب بعد خمسه ايام من اعطاء عقار المثيل بريدنزولون.

الكلمات الافتتاحية: مثيل بريدنزولون , متلازمة الضائقة التنفسية الحادة,فيروس كورونا المستجد (كوفيد-19) , انتقال المرض , كورتيكوس

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