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ORIGINAL ARTICLE

Efficacy of Methylprednisolone with Dexamethasone in patients with Severe Covid Pneumonia in Term of Clinical and Biochemical Improvement

JAVARIA ASLAM[1], MOMINA MASROOR[2], SAMI AHMAD[3], WAJAHAT HUSSAIN[4], HURRIA MANSOOR[5], LARAIB KHAN[6]
[1]Assistant Professor of Medicine, Quaid-e-Azam Medical College, Bahawalpur
[2,5,6]WMO, Department of Medicine, Sir Sadiq Abbasi Hospital, Bahawalpur
[3]Assistant Professor of Pulmonology, Quaid-e-Azam Medical College/ BVH, Bahawalpur
4Demonstrator, Department of Community Medicine, Quaid-e-Azam Medical College, Bahawalpur
Correspondence to Dr. Javaria Aslam, Assistant Professor,

ABSTRACT

Aim: Efficacy of Methylprednisolone with Dexamethasone in patients with severe COVID pneumonia in term of clinical and biochemical improvement.
Methodology: Cross Sectional analytical study conducted among COVID-19 patients admitted in HDU of Sir Sadiq Hospital, Bahawalpur from May, 2021 to June 2021 after taking approval from institutional ethical committee. 82 patients were included in this study after taking informed consent. Patients were divided into two groups A and B i.e. I/V methyl prednisolone and I/V dexamethasone respectively. Each group was containing 41 patients. Primary outcome was measured in terms of decrease or increase in oxygen demand leading to discharge or shifting to Intensive Care Unit. CRP levels were also measured to assess biochemical improvement.
Results: 31 (75.6%) patients from group A and 22(53.7%) from group B were improved and discharged and difference was statistically significant (p<0.05). Number of patients shifted to ICU were 10(24.4%) and 19(46.3%) from A and B groups respectively.
Conclusion: In terms of clinical and biochemical response methylprednisolone outperforms dexamethasone.
Keywords: Methylprednisolone, Dexamethasone, COVID pneumonia,

INTRODUCTION

COVID- 19 is caused by novel corona virus SARS-COV-2.[1] First case was identified in Wuhan, China, in December 2019, later in march 2020 it had been declared as a pandemic by WHO.[2] Till date, it has affected >88 million people around the world and >4 million had been died with an approximate mortality rate of 2-3%.[3] With such a high number of patients and a high mortality rate, the global health system has been overburdened, resulting in the collapse of health systems in many countries.[4] B.1.1.7(alpha) strain identified in UK which spread rapidly around the region, then B.1.351(beta)identified in south Africa was also aggressive as having 50% increase in spread rate and 20% increase in mortality than in previous wave. P.1(gamma) Brazilian strain both had aggressive behavior and spread in the region[5.] Now triple mutant Indian strain B.1.617.2 (delta) virus which is causing increased mortality in the country.[6]

METHODOLOGY

Study Design: Cross sectional analytical study.
Sample Size: At margin of error 5% (probability of making type 1 error), level of confidence 99% and power of 80%, proportion of patients responding to methylprednisolone 92.6% and responding to dexamethasone 63.1% the sample size in each group was 41.
Study Population: High Dependency Unit of Sir Sadiq Abbasi Hospital, Bahawalpur which is a COVID dedicated hospital from 1-5-2021 to 30-6-2021.
Inclusion Criteria: Patients positive by PCR and radiological evidence by having >50% lung involvement on HRCT and patients with severe COVID pneumonia having >5 liters oxygen demand via Non-Re breathing mask were included.
Exclusion Criteria: Patients with moderate disease requiring no oxygen support, having <50% lung disease on HRCT, those having critical illness and had persistent high blood pressure were excluded. Permission was granted by IRB.

Patients were divided in groups A and B each containing 41 patients. Patients with I/V Methylprednisolone 1-2 mg/kg body weight were included in group A, and those with I/V Dexamethasone 6 to 8 mg/day were included in group B. All patients had oxygen demand of 5-15 liters to maintain their oxygen saturation >92% and their CRP levels were 50-100mg/dl. Outcome was analyzed and measured in term of decrease in oxygen demand, decrease in hospital stay, and admission in ICU for Non-Invasive/Mechanical ventilation or discharge from hospital. Data was analyzed using SPSS version 20.

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RESULTS

The detail of results is given in tables 1,2

Table 1: Socio demographic variables

Variables	Group A	Group B
Age		
20-39 years	5(12.2%)	1(2.4%)
40-59 years	21(51.2%)	17(41.5%)
60-75 years	15(36.6%)	23(56.1%)
Gender		
Male	21(51.2%)	24(58.5%)
Female	20(48.8%)	17(41.5%)
Comorbid Conditions		
Hypertension	7(17.1%)	4(9.7%)
Ischemic Heart Disease	16(39.1%)	5(12.2%)
Diabetes Mellitus	1(2.4%)	10(24.4%)
COPD	1(2.4%)	0
Obesity	1(2.4%)	0
No Risk Factor	15(36.6%)	22(53.7%)
CRP on admission		
50-99mg/dl	13(31.7%)	18(43.9%)
>100mg/dl	28(68.3%)	23(56.1%)

Table 2: Comparison in terms of hospital stay and CRP levels

Outcome	Group "A"	Group "B"	P value
Hospital Stay			
1-10 days	26(63.4%)	19(46.4%)	
>11 days	5(12.2%)	3(7.3%)	>0.05
Undetermined period	10(26.8%)	19(46.3%)	
Follow up CRP			
Increased	10(24.4%)	19(46.3%)	<0.05
Decreased	31(75.6%)	22(53.7%)	
Discharged	31(75.6%)	22(53.7%)	
Shifted to NIV	10(24.4%)	19(46.3%)	<0.05

DISCUSSION

In our study, Methylprednisolone is better than dexamethasone in term of efficacy. Dexamethasone has been found to be of paramount importance in term of decreased mortality and decrease in hospital stay. Still, it is unclear if any other steroid type can be of same or more benefit for sever COVID pneumonia or acute respiratory distress syndrome and In relation to previous study which was a randomized control trial has shown that low dose dexamethasone 6mg/day for 10 days decreases mortality with a greater impact on mechanical ventilation (36% reduction) and oxygen demand (18% reduction) than those who did not require oxygen support.[7] This study only gave importance to one type of steroid to be effective in term of decrease in 28 days mortality in admitted patients in comparison to usual therapy given to these patients. But it could not interpret use of steroids in critical illness or acute respiratory distress syndrome (ARDS). Moreover, it does not show superiority of one type of steroid to other type of steroids which can create a broader view about use of steroids in severe COVID pneumonia. It had been said in previous studies that methylprednisolone has more penetration in the lung tissues as found in ARDS patients who were on ventilatory support.[9]

In one previous study, they have compared methylprednisolone to dexamethasone as a usual treatment in early pulmonary phase and found superior efficacy of methylprednisolone to dexamethasone.[8] In another study, comparison was also done in ICU patients and found that high dose methylprednisolone has decreased mortality in methylprednisolone group.[10] In a randomized control trial, methylprednisolone pulse therapy for 3 days in severe COVID pneumonia was compared to standard treatment and found a significant increase in survival time p value<0.001 as compared to group given standard treatment but it was not able to find any comparison between two types of steroids.[11] RCT did not compare outcome before mortality i.e. need for shifting to ICU for noninvasive ventilatory support which is an important predictor of mortality. In our study, we took it as an important measure for outcome and also compared two types of steroids in term of efficacy. In a study which compares high dose methylprednisolone and dexamethasone, it was found that hospital stay was shorter in methylprednisolone group with p value of <0.05[8] whereas we could not find any significant difference among two groups in term of hospital stay with p value of >0.05.

CONCLUSION

Methylprednisolone surpasses dexamethasone in term of decrease in oxygen support and discharge from hospital and decrease in inflammatory marker. But there is not a significant difference in term of decreasing hospital stay.

Conflict of interest: Nil

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