

Comparative study of methyl prednisolone and dexamethasone in pneumonia due to COVID-19

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Abstract

Background: Increasing in the number of covid-19 cases and increasing in mortality needs an early attention in treating the inflammation to avoid patient entering to ICU, various methods and drugs are under trial we use corticosteroid, methylprednisolone and dexamethasone its effect and safety of COVID-19 pneumonia. **Methodology:** Comparative study of 100 covid-19 pneumonia patient in Kannur medical college for 3 months from Sept 2020. 50 patients given methylprednisolone and other 50 patient given dexamethasone. **Results:** Patients are randomly selected for each group to give corticosteroids. In methylprednisolone group mean age in 47yrs. 59 males, 41 females, and 29.5 average BMI. In Dexamethasone 49yrs mean age, 62males, 38females with 32 average BMI. 45 patients are recovered with 5 deaths in methylprednisolone and 44 recovered and 6 deaths in dexamethasone. **Conclusion:** Both dexamethasone and methylprednisolone both are equally effective in controlling covid-19 pneumonia.

Keywords: Methylprednisolone, Dexamethasone, COVID-19, pneumonia.

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Introduction

The 2019 new Coronaviruses are identified and causing covid-19 disease WHO declared as pandemic on 12th march 2020[1] which started from chain and spread to all countries[2]. Infecting a large population and increasing the hospital admissions and mortality as we know that disease starts with a viral infection symptoms like fever, cough, fatigue, loss of taste, nasal congestion, headache, sore throat etc. And causing its sequel. Based on the clinical signs, symptoms and investigation sites classified in to mild moderate and severe diseases for the management. Till today there is no definite treatment for the covid-19 disease all are in trial and some drugs in use are chloroquine and hydroxychloroquine[3], lopinavir/ritonavir[4] azithromycin[5], and ivermectin[6], among others, showed some usefulness in vitro against SARS-CoV2 one among them is to save patient is the use of corticosteroids[11]. The use of corticosteroid is in dilemma some times its use as a good response and also worsens the disease. Guidelines tell us use of corticosteroids after viral replication will help more and if patient in severe disease its can be used to save life[12]. In this there are dose variations and also different corticosteroids.

Objectives: To study the effect and safety of methylprednisolone and dexamethasone in COVID-19 pneumonia.

Methods: This is a comparative study in Kannur medical college for a period of 3 months from Sept 2020 to Dec 2020 after a clearance from ethical committee. 100 Patients are selected in moderate to severe covid-19 disease.

Inclusion criteria

- 1 Age 20-60 years
- 2 Covid PCR positive
- 3 oxygen saturation of less than 94%
- 4 Moderate or severe covid 19 disease

Exclusion criteria

1. Severe immunosuppression patients
2. Chronic illness patients
3. Not willing to give consent
4. Pregnancy or lactating females
5. Who are on ventilator for treatment

All the patients' clinical findings, vitals with oxygen saturation, basic investigations with chest x-ray, CRP (C-reactive protein) and serum ferritin noted. Based on WHO criteria severe disease CRP>50, serum ferritin<10, and chest x-ray consolidation/infiltration considered as severe and no x-ray findings CRP30-50, oxygen saturation <93 is moderate covid-19 disease. Randomly selection of 50 patients for IV (Intravenous) Methylprednisolone 1 mg/kg/day twice daily for 7 days And another 50 patients given IV dexamethasone 8 mg/day for 7 days. On 7th day findings of chest x-ray, CRP, serum ferritin, oxygen saturation are noted. During the treatment if patient indicated for other medicines and investigations are done without delay. Data's collected are correlated on 1st to 7th day after steroid treatment. Data are tabulated and statistically analysed

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Table 1: Tabulated data

Factors	Mild	Moderate	Severe
Spo ₂ (at room air)	>94%	90-94%	<90%
Respiratory rate	<24	24-30	>30
Chest x-ray	Normal	Pneumonia 1/two zone	Involving >two zone
CRP	<20	20-50	>50
Ferritin	<500	>500	>400
d-dimer	<0.5	0.5-1	>1

Result

In our study out of 100 patients which are divide into two groups with 50 patients each mean age group of 47.24 in Methylprednisolone and 49 in dexamethasone, 59/41 males and females in Methylprednisolone and 62/38 in dexamethasone, in Methylprednisolone mean BMI is 29.5 and 32 in dexamethasone.

Methylprednisolone group 21 patients shifted to ICU, 12 needs ventilator support, 5 deaths and 62 recovered similarly in dexamethasone group 19 patients shifted to ICU, 9 needs ventilator support, 6 deaths and 66 recovered. Both the groups have significant decrease in temperatures and significant decrease in oxygen requirement mean is 10.21 L, significant decrease in inflammatory indicators D-dimer and CRP, improvement in ferritin.

Table 2: Demographic factors

Factors	Methylprednisolone	Dexamethasone	P-Value
Age	47.24 ±10.54	49 ±8.54	0.754
Sex M/F	59/41	62/38	0.741
BMI	29.5±8.8	32±6.5	0.543

Table 3: Base line values

Factors	Methylprednisolone	Dexamethasone	P-Value
SPO ₂	91.6±2.0	92±45	0.650
CRP	134±22	132±18.2	0.547
Serum Ferritin	566.1±11.2	568±14.8	0.738
D-dimer	1.1±0.5	1.0±0.3	0.627

Table 4: Outcome comparison.

Out comes	Methylprednisolone	Dexamethasone	P-Value
Shifted to ICU	21	19	0.274
Ventilator support	12	9	0.341
Mortality	5	6	0.024
Recovered	45	44	0.002

Discussion

This study highlight the importance of steroid in the covid pandemic where no definitive treatment available it's more useful in the stage of cytokine storm to save the life of patient. We used two different corticosteroids, dexamethasone and methylprednisolone 50 patients each. Apart from the steroid we gave the guidelines treatment to the patients like tocilizumab, plasma therapy antibiotics where ever it is indicated. We found that steroid as better outcome; there is no much difference in both the drugs in their outcome. In a study by Wilkinson et al shows that use of dexamethasone significantly reduces mortality this will more highlighted in patient on ventilator support and oxygen dependent patients shows only 22.9% mortality in dexamethasone compare to 25.7% standard care [7]. Wang et al of china a study shows significant reduction in morbidity and mortality with methylprednisolone [8,9]. Fadel et al study with covid patient improvement in outcome and shorter length of stay in hospital with methylprednisolone [10]. Steroids have a proven role in reducing inflammation in asthma and sometimes acute exacerbation of COPD [9]. There is also a significant role of steroids in septic shock [10]. Expired patient were very sick and admitted in late stage. One patient as cardiac arrest. This study morbidity and mortality benefit of corticosteroids in moderate and severe COVID-19 it may be due to its anti-inflammatory effect of corticosteroid.

Limitations: This study is a small number of patient, effect of other drugs not included, it's particularly in single area need multiple regions and larger populations, day of start of steroid is not taken in study.

Conclusion

This study shows the importance of steroid at present conditions of covid-19 pneumonia. Highlights the importance of both dexamethasone and methylprednisolone both are equally effective.

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