



E-ISSN: 2706-9575

P-ISSN: 2706-9567

IJARM 2021; 3(2): 300-303

Received: 15-06-2021

Accepted: 28-07-2021

**Dr. Baddam Akshitha Reddy**  
Final year postgraduate,  
Department of General  
medicine, Kamineni Academy  
of Medical Sciences and  
Research Centre, L.B Nagar,  
Hyderabad, Telangana, India

**Dr. J Hari Kishan**  
Professor, Department of  
General medicine, Kamineni  
Academy of Medical Sciences  
and Research Centre, L.B  
Nagar, Hyderabad, Telangana,  
India

**Dr. M Shravani Veena**  
House Surgeon, Kamineni  
Academy of Medical Sciences  
and Research Centre, L.B  
Nagar, Hyderabad, Telangana,  
India

**Dr. Bottu Kalyani**  
Final year postgraduate,  
Department of General  
medicine, Kamineni Academy  
of Medical Sciences and  
Research Centre, L.B Nagar,  
Hyderabad, Telangana, India

**Dr. Mamidi Rohini Reddy**  
Final year postgraduate,  
Department of General  
medicine, Kamineni Academy  
of Medical Sciences and  
Research Centre, L.B Nagar,  
Hyderabad, Telangana, India

**Dr. P Bhavya**  
Final year postgraduate,  
Department of General  
medicine, Kamineni Academy  
of Medical Sciences and  
Research Centre, L.B Nagar,  
Hyderabad, Telangana, India

**Corresponding Author:**

**Dr. Baddam Akshitha Reddy**  
Final year postgraduate,  
Department of General  
medicine, Kamineni Academy  
of Medical Sciences and  
Research Centre, L.B Nagar,  
Hyderabad, Telangana, India

## Are high dose steroids are preferable than low dose steroids in COVID 19 pneumonia?

**Dr. Baddam Akshitha Reddy, Dr. J Hari Kishan, Dr. M Shravani Veena, Dr. Bottu Kalyani, Dr. Mamidi Rohini Reddy and Dr. P Bhavya**

DOI: <https://doi.org/10.22271/27069567.2021.v3.i2e.262>

### Abstract

**Background:** In COVID 19 there is systemic inflammatory response that can lead to lung injury and multisystem organ dysfunction. It has been proposed that the potent anti-inflammatory effects of corticosteroids might prevent or mitigate these deleterious effects. Conversely at the other end of the dose range high levels of corticosteroids are immunosuppressive and can increase risk of fatal infection including sepsis. Giving optimal level of corticosteroids at the right time is vital to control infections and restore homeostasis.

**Aim:** The aim of the study is to compare benefits and side effects of high dose corticosteroids and low dose corticosteroids in treatment of covid 19 pneumonia.

**Materials and Methods:** This study is retrospective, observational study of 80 patients diagnosed with covid 19 pneumonia. They were divided into two groups, one group of patients received low dose of steroids (0.5-1mg/kg/day for 7-10days) and other group of patients received high dose of steroids(>250mg/day for 7-10days).In these two groups of patients we compared duration of hospital stay, duration of oxygen support, mortality rate of the patients. These group of patients are followed up for development of side effects of corticosteroids, here we look into three side effects-recurrent infections, poorly controlled diabetes and skin manifestations. Data was analysed.

**Results:** Out of 80 patients (40 in high dose group and 40 in low dose group) mean duration of hospital stay and mean number of days of oxygen support were more in high dose group compared to low dose group. However, the difference was not found to be statistically significant (P value >0.05). In low dose group 22.5% died as compared to 40% in high dose group. However, on performing chi square test, this difference was not found to be statistically significant (P value >0.05). In low dose group 3.2% had complications as compared to 25% in high dose group. On performing chi square test, this difference was found to be statistically significant (P value <0.05). In low dose group 9 patients were expired and in out of remaining 31 patients, 1 patient developed acne. In high dose group 16 patients were expired and in out of remaining 24 patients, 1 patient developed mucormycosis, 1 patient developed lung abscess, 2 patients had acne, 1 patient had poorly controlled diabetes mellitus, 1 patient had recurrent UTI with poorly controlled diabetes mellitus.

**Interpretation:** Our study showed there are equal benefits with both high dose and low dose of steroids in covid 19 pneumonia but high dose steroids have more side effects than low dose of steroids. So low dose steroids are more preferable than high dose steroids in covid 19 pneumonia. However our sample being small, a study with a large number of samples required to predict the outcome.

**Keywords:** Covid-19, mucormycosis, UTI, corticosteroids, mortality, uncontrolled diabetes

### Introduction

Covid 19 is a global pandemic. Its clinical spectrum ranges from asymptomatic to severe covid pneumonia. Recently some studies showed use of high dose of steroids in covid pneumonia results in early recovery and decreased mortality rate but no trial done comparing the benefits and side effects of high dose of steroids and low dose of steroids. This study is done to know whether high dose steroids are preferred over low dose steroids.

### Material and Methods

#### Study design and participants

This study is retrospective, observational study of 80 patients diagnosed with covid 19 pneumonia in april and May 2021 in Hyderabad. Here we have included

- Patients with microbiologically confirmed covid 19 with radiological evidence of covid pneumonia

b) Patients who are coming under category of moderate to severe covid 19 with either Respiratory rate >24cpm or saturation <94% on room air

Patients coming under mild category that is who are asymptomatic and with Respiratory rate <24cpm or saturation 94% on room air are excluded. Data is collected from the medical records.

**Procedure**

Total 80 patients were divided into two groups, one group of patients receiving low dose of steroids(0.5-1mg/kg/day for 7-10days) and other group of patients receiving high dose of steroids (>250mg/day for 7-10days). Both groups received other standard treatment.

**Statistical analysis**

In these two groups of patients we compared duration of hospital stay, duration of oxygen support, mortality rate of

the patients. These group of patients are followed up for development of side effects of corticosteroids, here we look into three side effects-recurrent infections, poorly controlled diabetes and skin manifestations. Data was analysed using SPSS v21. Categorical data was presented as frequencies and percentages. Continuous data was presented as mean and standard deviation. Chi square test was used as test of significance for categorical data. Mann Whitney test was used as test of significance for continuous data (two groups) (skewed data/abnormal data). p value less than 0.05 was considered as statistically significant.

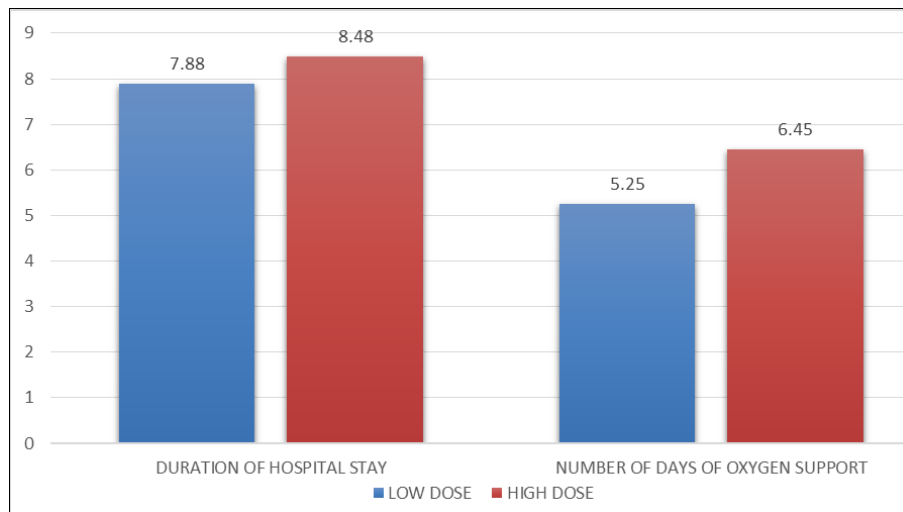
**Results**

Among two groups mean duration of hospital stay and mean number of days of oxygen support were more in high dose group compared to low dose group. However, the difference was not found to be statistically significant (P value >0.05).

**Table 1:** Duration of Hospital stay

	Steroid	N	Mean	Std. deviation	P Value
Duration of hospital stay	Low dose	40	7.88	3.568	.552 (NS)
	High dose	40	8.48	4.432	
Number of days of oxygen support	Low dose	40	5.25	4.425	.169 (NS)
	High dose	40	6.45	4.557	

\*Mann Whitney test



**Fig 1:** Duration of Hospital stay

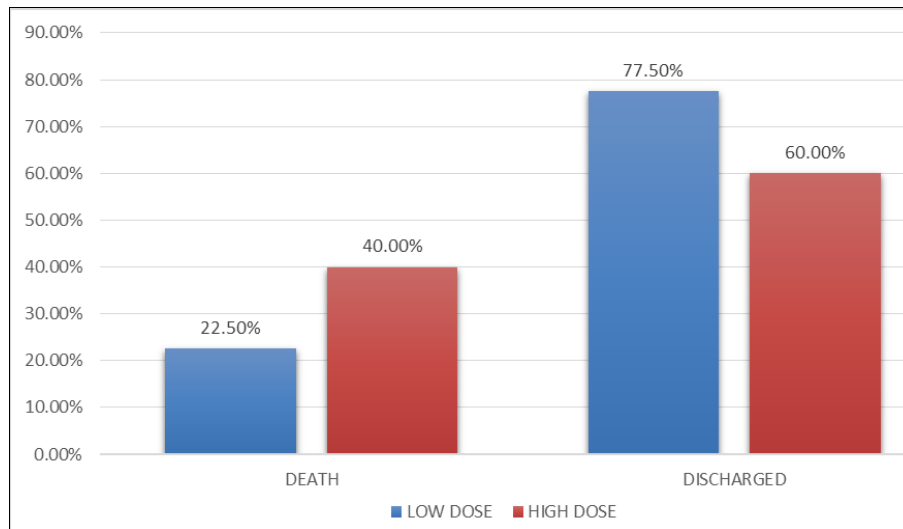
In low dose group 22.5% died as compared to 40% in high dose group. However, on performing chi square test, this

difference was not found to be statistically significant (P value >0.05).

**Table 2:** Outcome compared with low and high doses

		Steroid		Total	
		Low dose	High dose		
Outcome	Death	Count	9	16	25
		%	22.5%	40.0%	31.3%
	Discharged	Count	31	24	55
		%	77.5%	60.0%	68.8%
Total		Count	40	40	80
		%	100.0%	100.0%	100.0%

Chi Square = 2.851, P value = 0.091 (NS)



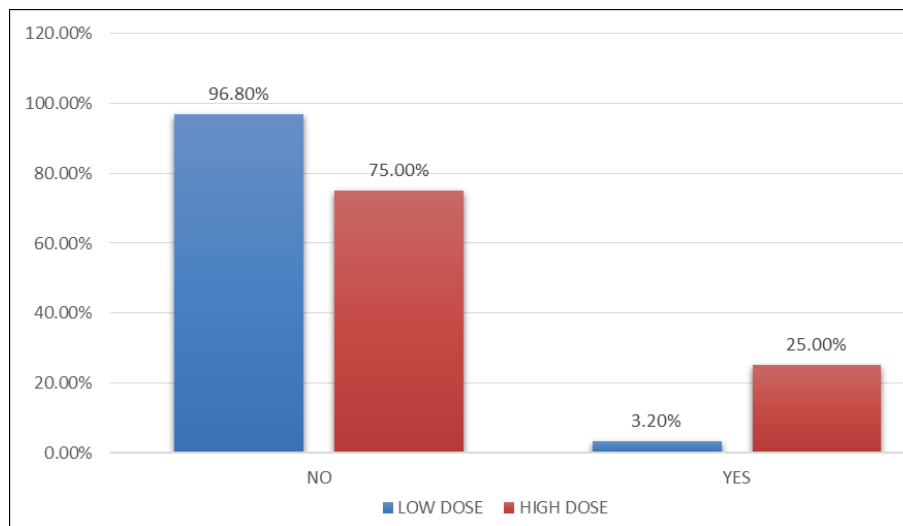
**Fig 2:** Outcome compared with low and high doses

In low dose group 9 patients were expired and in out of remaining 31 patients, 1 patient developed acne. In high dose group 16 patients were expired and in out of remaining 24 patients, 1 patient developed mucormycosis, 1 patient developed lung abscess, 2 patients had acne, 1 patient had poorly controlled diabetes mellitus, 1 patient had recurrent UTI with poorly controlled diabetes mellitus. In low dose group 3.2% had complications as compared to 25% in high dose group. On performing chi square test, this difference was found to be statistically significant (P value <0.05).

**Table 3:** Complications

		Steroid		Total	
		Low dose	High dose		
Complications	No	Count	30	18	48
		%	96.8%	75.0%	87.3%
	Yes	Count	1	6	7
		%	3.2%	25.0%	12.7%
Total		Count	31	24	55
		%	100.0%	100.0%	100.0%

Chi square = 5.774, P value = 0.016 (S)



**Fig 3:** Complications

**Discussion**

The ongoing pandemic of Corona virus Disease 2019 (COVID-19), caused by the novel Severe Acute Respiratory Syndrome-Coronavirus (CoV)-2 (SARS-CoV-2), was declared a Public Health Emergency of International concern on January 30, 2020 by the World Health Organization (WHO) [1]. Its first case reported in December 2019 in Wuhan, China. SARS-CoV-2 has a zoonotic source closely related to bat-origin SARS-like coronavirus [3]. Most patients with COVID-19 predominantly have a respiratory tract infection associated with SARS-CoV-2 infection. However, in a small proportion of cases, they can progress to a more severe and systemic disease characterized by the Acute Respiratory Distress Syndrome (ARDS), sepsis and

septic shock, multi organ failure, including acute kidney injury and cardiac injury [3]. Several pharmacological agents have been proposed as a potential treatment based on theoretical considerations, *in vitro* studies, or clinical trials conducted in conditions by other related viruses. However, current evidence has not confirmed the presence or absence of benefit of these treatments and even warns of their probable risks or adverse effects associated with their use [4]. The anti-inflammatory properties of corticosteroids reduce systemic inflammation, exudative fluid in the lung tissue and also prevents the further diffuse alveolar damage, thereby improving the hypoxia and minimizes the risk of respiratory failure [5].

Glucocorticoids are essential during infection or following trauma. Conversely at the other end of the dose range high levels of glucocorticoids are immunosuppressive and can increase risk of fatal infection including sepsis. Hitting the optimal level of glucocorticoids at the right time is vital to control infections and restore homeostasis [2]. Therefore what is lacking is knowledge on the optimal start of corticosteroid administration after the start of illness, specific subpopulations and type, dose and duration of corticosteroids [8]. Given the diversity in the mechanism of action of glucocorticoids, they can cause a wide array of adverse effects ranging from mild to severe, some of which are unavoidable. Of all the factors influencing the adverse effects of glucocorticoids, dose and duration of therapy are the most important independent and well-documented risk factors [6] several other factors may influence the adverse effects of glucocorticoids. Older age, comorbid conditions (such as diabetes mellitus), concomitant use of other immunosuppressive agents, severity and nature of the underlying disease, and poor nutritional status can all influence the occurrence and magnitude of side effects [6]. Short-term corticosteroid use is associated with generally mild side effects, including cutaneous effects, electrolyte abnormalities, hypertension, hyperglycemia, pancreatitis, hematologic, immunologic, and neuropsychological effects, although occasionally, clinically significant side effects may occur [9].

Here this study is retrospective, observational study in covid 19 patients. This study is done to avoid confusion among physicians in choosing the steroid dosage in covid pneumonia patients. After analysis of both study groups, it showed both groups have equal benefits but more side effects are seen in high dose group.

### Conclusion

Our study showed there is no significant difference in duration of hospital stay, duration of oxygen support and mortality rate of patients who received high dose of steroids than low dose of steroids in covid pneumonia but there are more side effects with high dose group compared to low dose group. High dose steroids are to be used with caution. Low dose steroids are more preferable than high dose steroids. However our sample being small, a study with a large number of samples required to predict the outcome.

### Acknowledgment

The author is thankful to Department of General Medicine for providing all the facilities to carry out this work.

### Conflict of Interest

None

### Funding Support

Nil

### References

1. Solinas C, Perra L, Aiello M, Migliori E, Petrosillo N. A critical evaluation of glucocorticoids in the management of severe COVID-19. *Cytokine & growth factor reviews* 2020;54:8-23. <https://doi.org/10.1016/j.cytogfr.2020.06.012>
2. Singh AK, Majumdar S, Singh R, Misra A. Role of corticosteroid in the management of COVID-19: A systemic review and a Clinician's perspective. *Diabetes*

- & metabolic syndrome 2020;14(5):971-978. <https://doi.org/10.1016/j.dsx.2020.06.054>
3. <https://www.mohfw.gov.in/pdf/ClinicalManagementProtocolforCOVID19dated27062020.pdf>
  4. Rodríguez-Molinero A, Pérez-López C, Gálvez-Barrón C, Miñarro A, Rodríguez Gullello EA, Collado Pérez I *et al.* On behalf of the group of researchers for COVID-19 of the Consorci Sanitari de l'Alt Penedès i Garraf (CSAPG). Association between high-dose steroid therapy, respiratory function, and time to discharge in patients with COVID-19: Cohort study. Association between high-dose steroid treatment, respiratory function, and time to discharge in COVID-19 patients: Cohort study. *Clinical Medicine* 2021;156(1):7-12. <https://doi.org/10.1016/j.medcli.2020.08.003>
  5. Role of corticosteroid in the management of COVID-19: A systemic review and a Clinician's perspective Awadshesh Kumar Singh, Sujoy Majumdar, Ritu Singh, Anoop Misra *Diabetes Metab Syndr.* 2020 September-October 14(5), 971-978. Published online 2020 Jun 27. doi: 10.1016/j.dsx.2020.06.054
  6. Yasir M, Goyal A, Bansal P *et al.* Corticosteroid Adverse Effects. [Updated 2021 Jul 8]. In: Stat Pearls [Internet]. Treasure Island (FL): Stat Pearls Publishing; 2021 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK531462/>
  7. Van Paassen J, Vos JS, Hoekstra EM, Neumann KMI, Boot PC, Arbous SM. Corticosteroid use in COVID-19 patients: a systematic review and meta-analysis on clinical outcomes. *Crit Care* 2020;24(1):696. Published 2020 Dec 14. Doi: 10.1186/s13054-020-03400-9
  8. Buchman AL. Side effects of corticosteroid therapy. *J Clin Gastroenterol* 2001;33(4):289-94. Doi: 10.1097/00004836-200110000-00006. PMID: 11588541.