

Center

Background

Corticosteroids confer a survival benefit in hospitalized COVID-19 patients requiring oxygen, but optimal treatment duration remains uncertain. The goal of this metaanalysis is to determine the optimal duration of corticosteroids in the treatment of severe COVID-19.

Methods

Multiple Electronic databases were searched from the dates O† December 2019 to March 2022 for randomized controlled trials and observational cohort studies reporting corticosteroid versus no corticosteroid treatment in hospitalized COVID-19 patients. Risk of bias was assessed using the Risk of Bias Cochrane tool (randomized controlled trials) or the Ottawa Scale Newcastle (observational studies).

The effect of corticosteroids on mortality was estimated by randomeffects meta-analyses using the generic inverse variance method. Subgroup analyses and metaanalyses were conducted to assess the optimal duration of corticosteroid treatment.

Results



29% mortality reduction in the steroids group

Study	Risk Ratio	RR	95%-CI
7 days			
Li, China, 2020 —	-	0.15	[0.02; 1.39
Edalatifard, Iran, 2020		0.29	[0.15; 0.56
Salton, Italy, 2020	_ _	0.29	[0.12; 0.72]
Mikulska, Italy, 2020		0.32	[0.18; 0.58]
Corral-Gudino, Spain, 2021		0.37	[0.19; 0.73]
Fadel, USA, 2020		0.45	[0.22; 0.92]
Dequin, France, 2020		0.53	[0.27; 1.03]
Ma, China, 2020		0.53	[0.08; 3.53]
Fernandez_Cruz, Spain, 2020		0.58	[0.36; 0.94]
Bartoletti, Italy, 2020		0.59	[0.20; 1.74]
Nelson, USA, 2021	- -	0.74	[0.45; 1.22]
Borie, France, 2020		0.75	[0.49; 1.14]
Overall (Random-Effect Model)	•	0.65	[0.51; 0.83]
Heterogeneity: $I^2 = 63\%$, $p = 0.0017$			
> 7 days			
RECOVERY Group, UK, 2020		0.83	[0.75; 0.92]
Angus, International, 2020		0.84	[0.64; 1.10]
Bani-Sadr, France, 2020		0.90	[0.53; 1.53]
Jeronimo, Brazil, 2021		0.92	[0.67; 1.27]
Papamanoli, USA, 2020	+	0.93	[0.76; 1.14]
Tomazini, Brazil, 2020	+	0.97	[0.72; 1.31]
Overall (Random-Effect Model)	-	0.64	[0.44; 0.93]
Heterogeneity: $I^2 = 57\%$, $p = 0.0395$			
	0.1 0.5 1 2 10		

Association between Systemic Steroid and COVID-19 Mortality

No additional survival benefit was observed beyond 7 days of treatment

Optimal Duration of Systemic Corticosteroids Use in COVID-19 Treatment: A Meta-analysis



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Greatest survival benefit is treatment duration up to 6 days

Discussion

This meta-analysis of 27 studies (7 RCT and 20 observational studies) supports the positive impact of administration of corticosteroids on mortality in hospitalized patients with COVID-19.

This meta-analysis suggests that the optimal duration of systemic steroid use in severe COVID-19 infection is limited to less than 7 days. By shortening the duration of systemic steroids in COVID-19 patients, we may be able to optimize benefit and minimize the risk of side effects.

Study, Country, Year

Edalatifard, Iran, 2020 Corral-Gudino, Spain, 2021 Dequin, France, 2020 RECOVERY Group, UK, 2020 Angus, International, 2020 Jeronimo, Brazil, 2021 Tomazini, Brazil, 2020 **Overall (Random-Effect Model)** Heterogeneity: $I^2 = 67\%$, p = 0.0056Non-RCT Li, China, 2020 Zhao, China, 2020

Salton, Italy, 2020 Mikulska, Italy, 2020 Wu, China, 2020 Fadel, USA, 2020 Majmundar, USA, 2020 Ma, China, 2020 Fernandez_Cruz, Spain, 2020 Bartoletti, Italy, 2020 Falcone, Italy, 2020 Yang, China, 2020 Nelson, USA, 2021 Borie, France, 2020 Bani-Sadr, France, 2020 Papamanoli, USA, 2020 Krishnan, USA, 2020 Rodriguez-Bano, Spain, 2020 Zhou, China, 2020 Guan, China, 2020 **Overall (Random-Effect Model)** Heterogeneity: $I^2 = 71\%$, p < 0.0001

Conclusions

In this meta-analysis, the optimal duration of corticosteroid treatment for hospitalized COVID-19 patients was up to 6 days, with no additional survival benefit with > 7 days of treatment. Future analyses should stratify survival benefit by baseline disease severity to see if subgroups of patients derive greater benefit from longer courses of steroids.

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Association between Systemic Steroid Use and COVID-19 Mortality

Study design did not affect survival benefit