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Effect of remdesivir on patients with COVID-19: A network meta-analysis of randomized control trials

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ABSTRACT

Several randomized controlled trials (RCTs) were conducted to investigate the effect of remdesivir for patients with COVID-19, but their results were conflicting. Thus, we conducted a network meta-analysis comparing the rate of clinical improvement among patients with COVID-19 who received 5-day course of remdesivir versus 10-day course of remdesivir versus standard care. Our network meta-analysis of 4 randomized controlled trials demonstrated that the rate of clinical improvement was significantly higher in the 5-day remdesivir group and 10-day remdesivir group compared to standard care group (OR [95% confidence interval [CI]] =1.89 [1.40-2.56], P <0.001, OR [95% CI] =1.38 [1.15-1.66], P <0.001, respectively). In addition, the rate of clinical improvement was significantly higher in the 5-day remdesivir group compared to the 10-day remdesivir group (OR [95% confidence interval [CI]] =1.37 [1.01-1.85], P =0.041). Our analysis demonstrated that the use of remdesivir for patients with COVID-19 was associated with the significantly higher clinical improvement rate compared with standard care alone.

1. Summary

Remdesivir is a monophosphoramidate prodrug that has a broad antiviral spectrum including coronaviruses and inhibits all human and animal coronaviruses in vitro. Several randomized controlled trials (RCTs) were conducted to investigate the effect of remdesivir for patients with COVID-19, but their results were conflicting. Thus, we conducted a network meta-analysis comparing the rate of clinical improvement among patients with COVID-19 who received 5-day course of remdesivir versus 10-day course of remdesivir versus standard care.

Our network meta-analysis of 4 randomized controlled trials demonstrated that the rate of clinical improvement was significantly higher in the 5-day remdesivir group and 10-day remdesivir group compared to standard care group (OR [95% confidence interval [CI]] =1.89 [1.40-2.56], P <0.001, OR [95% CI] =1.38 [1.15-1.66], P <0.001, respectively). In addition, the rate of clinical improvement was significantly higher in the 5-day remdesivir group compared to the 10-day remdesivir group (OR [95% confidence interval [CI]] =1.37 [1.01-1.85], P =0.041).

Several therapeutic agents have been evaluated for the treatment of coronavirus disease 2019 (Covid-19), but none have yet been shown to be effective.

2. Short communication

Remdesivir is a monophosphoramidate prodrug that has a broad antiviral spectrum including coronaviruses and inhibits all human and animal coronaviruses in vitro (Sheahan et al., 2017). Several randomized controlled trials (RCTs) were conducted to investigate the effect of remdesivir for patients with COVID-19, but their results were conflicting (Wang et al., 2020; Beigel et al., 2020; Goldman et al., 2020; ANON, 2020). Thus, we conducted a network meta-analysis comparing the rate of clinical improvement among patients with COVID-19 who received 5-day course of remdesivir versus 10-day course of remdesivir versus standard care. All RCTs which investigated the efficacy of remdesivir for patients with COVID-19 were identified including preliminary reports. The outcome of interest was the clinical improvement within 14 days after randomization. The definition of clinical improvement was applied

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Comparison: other vs 'Standard'
(Random Effects Model) | OR | 95%-CI
--- | --- | ---
Remdesivir 10 days | 1.38 [1.15; 1.66]
Remdesivir 5 days | 1.89 [1.40; 2.56]

Comparison: other vs 'Remdesivir 10 days'
(Random Effects Model) | OR | 95%-CI
--- | --- | ---
Remdesivir 5 days | 1.37 [1.01; 1.85]
Standard | 0.73 [0.60; 0.87]

Fig. 1. Forest plots among treatment strategies for clinical improvement (random-effects model); A: versus Standard care; B: versus 10-day remdesivir CI = confidence interval; OR = odds ratio.

Disclosure
None.

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Appendix A. Supplementary data
Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.virusres.2020.198137.

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