Remdesivir Reduced the Hazard of Hospital Readmission in People With COVID-19 Admitted to the ICU While Delta and Omicron Were the Predominant Circulating Variants

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Introduction

- Since the inception of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic, mutations in the virus have resulted in the emergence of new variants[1]
- In the late summer and fall of 2021, the Delta variant was the predominant circulating strain of SARS-CoV-2 in the United States[2]
- Continued evolution of SARS-CoV-2 has led to the emergence of the Omicron variant, which is currently the most prevalent variant circulating worldwide[3,4]
- Remdesivir (RDV; Veklury®) is a broad-spectrum nucleotide analogue prodrug approved for the treatment of COVID-19 in nonhospitalised and hospitalised individuals,[5] with clinical benefits demonstrated in numerous clinical trials[6-8]
- In vitro studies have demonstrated that RDV retains potent antiviral activity against Delta and Omicron (B.1.1.529/BA.1, BA.2, BA.2.12.1, BA.4, BA.5, BA.2.75, BA.4.6, BF.5, XBB, and BQ.1.1), with potencies comparable to those of wild-type ancestral reference isolates[9,10]
- As new variants of SARS-CoV-2 emerge, the real-world effectiveness of antiviral drugs must be monitored
- Limited data exist regarding the association between COVID-19 therapies and hospital readmissions during the emergence of new variants

Objective

- To evaluate the association between RDV and all-cause readmission in individuals who were diagnosed with COVID-19 and admitted to the intensive care unit (ICU) across 2 dominant variant eras: Delta (June 2021-November 2021) and Omicron (December 2021-February 2022)

Methods

- This was a retrospective, observational cohort study of individuals admitted to the ICU using the HealthVerity Real-Time Insights and Evidence database (Philadelphia, PA, USA), which includes US data from hospital chargemaster and linked medical/pharmacy claims
- Individuals aged ≥18 years who were hospitalised between 1 June 2021 and 28 February 2022 with a primary diagnosis of COVID-19 and had a minimum of 12 months of prior claims enrolment (continuous with gaps ≤30 days) were included
- Two cohorts in the ICU at the index date (RDV initiation date or corresponding match date) were identified
  - Participants in the RDV cohort received ≥1 dose of RDV at any time during hospitalisation
  - Participants in the comparator cohort did not receive RDV up to the match date and were censored at crossover if RDV was initiated
- Exact matching between cohorts was performed on age (<18, 18-29, 30-39, 40-49, 50-59, 60-74, and ≥75 years), sex, immunocompromised status, date of hospitalisation (±3 days), days in the hospital prior to the match date, and oxygen support status at hospital admission
- Further differences in baseline covariates were balanced by propensity score matching
- Individuals were followed from index hospitalisation to the earliest of hospital readmission (30, 60, and 90 days), in-hospital death, loss to follow-up, end of study at 6 months, or end of data, whichever occurred earlier
- After multivariable adjustment, Cox proportional hazards models were used to compare RDV and comparator hospital readmissions at 30, 60, and 90 days

Results

All-cause Hospital Readmission at 30, 60, and 90 Days After Index Hospitalisation During the Delta and Omicron Epochs

- A total of 8044 individuals admitted to the ICU were matched; 4022 individuals who received RDV were matched 1:1 to comparator participants
- Absolute rates of readmission at each time point were lower for the RDV versus the comparator cohort (**Table 1**)

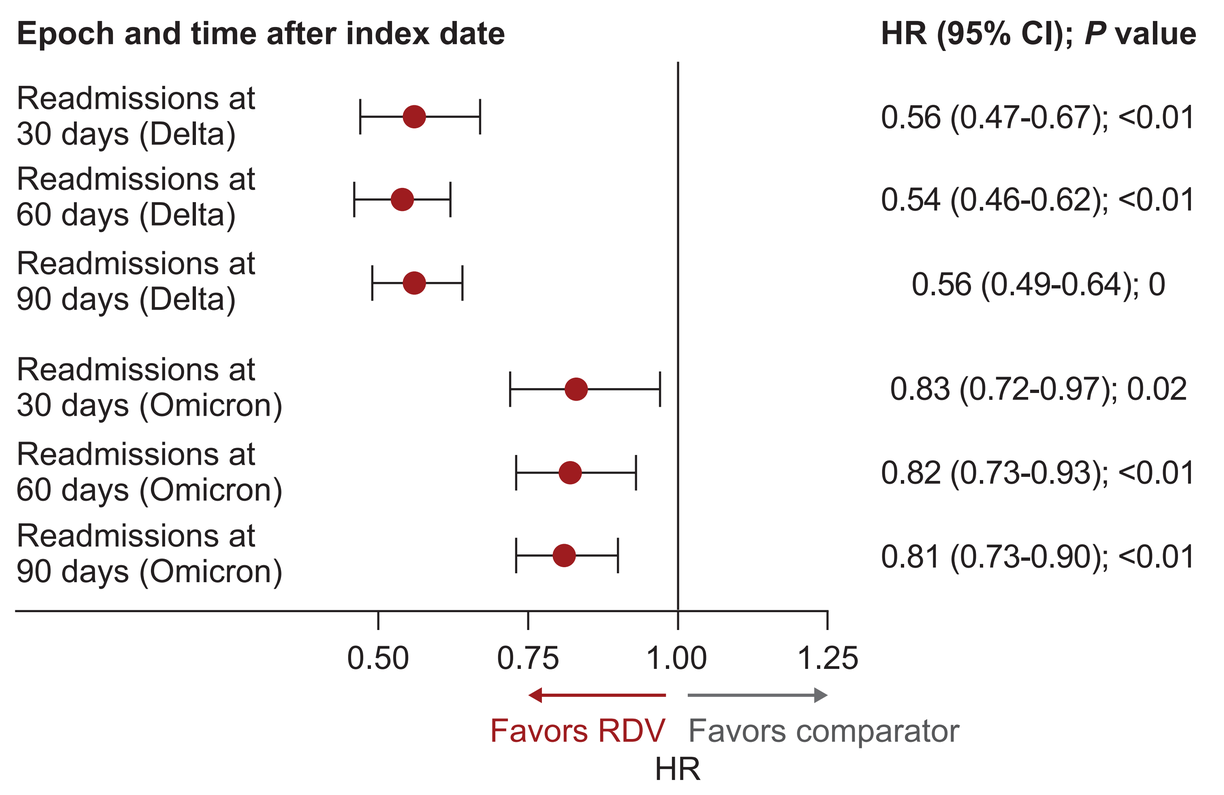
Table 1. Readmission of Individuals Admitted to the ICU at the Index Date in the RDV and Comparator Cohorts During the Delta and Omicron Epochs

	Comparator			RDV		
	Number of events	Person-years	Rate per 10 person-years	Number of events	Person-years	Rate per 10 person-years
Delta, n		**2281**			**2281**	
Readmissions at 30 days	211	173	12.20	144	175	8.23
Readmissions at 60 days	331	308	10.75	209	315	6.63
Readmissions at 90 days	393	430	9.14	265	442	6.00
Omicron, n		**1741**			**1741**	
Readmissions at 30 days	235	129	18.22	217	130	16.69
Readmissions at 60 days	375	227	16.52	330	229	14.41
Readmissions at 90 days	448	313	14.31	399	316	12.63

ICU, intensive care unit; RDV, remdesivir.

- RDV was associated with a significantly reduced risk of hospital readmission at 30, 60, and 90 days in both epochs (**Figure 1**)

Figure 1. HR for Readmission at 30, 60, and 90 Days After the Index Date in Individuals With COVID-19 Admitted to the ICU During the Delta and Omicron Epochs



HR, hazard ratio; ICU, intensive care unit; RDV, remdesivir; CI, confidence interval.

Conclusion

- **In this real-world cohort analysis of individuals hospitalised with COVID-19 who were admitted to the ICU, those treated with RDV had reduced hospital readmission risk at 30, 60, and 90 days, irrespective of the predominant circulating SARS-CoV-2 variant**

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