Poster
WMF21-2970

Comparative Effectiveness of Remdesivir Treatment in Patients Hospitalized with COVID-19

Anand P. Chokkalingam,[1] Hu Li,[1] Julius Asubonteng,[1] Essy Mozaffari,[1] Jocelyn R. Wang,[2] Christopher Bush,[2] Jennifer Hayden,[2] Anu O. Osinusi[1]

[1]Gilead Sciences, Inc., Foster City, California; [2]Aetion, Inc. New York, New York

GILEAD
Gilead Sciences, Inc.
333 Lakeside Drive
Foster City, CA 94404
Tel: 650-574-3000

Introduction

- Remdesivir (RDV), is a direct-acting nucleotide pro-drug inhibitor of viral RNA-dependent RNA polymerases
  - RDV has been approved by FDA and other regulatory authorities for treatment of hospitalized patients with COVID-19
- Efficacy of RDV was demonstrated in a randomized double-blind, placebo-controlled trial (ACTT-1) which demonstrated improved recovery and other clinical outcomes
- Real world data can complement results from well-controlled trials
  - during a pandemic, where evolution of clinical management can outpace development of new trials
  - when markedly larger sample sizes are needed to assess secondary outcomes or outcomes in important patient subgroups
- This study evaluates the effectiveness of RDV in a large real world dataset of hospitalized COVID-19 patients

Objective

- To evaluate the real-world effectiveness of remdesivir by comparing mortality and hospital discharge in patients exposed to remdesivir versus matched referent patients

Methods

Study design

- We conducted a comparative effectiveness analysis using a matched cohort design in US-based hospital claims data for hospitalized patients with COVID-19 with or without evidence of treatment with remdesivir during their hospital stay according to a pre-specified analytical plan

Data source

- The HealthVerity data ecosystem, which includes de-identified US-based hospital chargemaster, medical and pharmacy claims, laboratory, and EHR data, including Veradigm claims and EHR data, for patients with activity between December 1, 2018 and May 3, 2021

Study population

- The study included patients hospitalized with newly diagnosed COVID-19 between May 1, 2020, the date of RDV emergency use authorization (EUA), and May 3, 2021.

Inclusion criteria

- Any hospitalized patient 18 years of age or older with both of the following:
- COVID-19 diagnosis on their hospitalization record
- Minimum of 12 months enrollment or claims prior to index date, with at least 1 medical encounter during this period

Exclusion criteria

- Patients with evidence of being treated in a clinical trial at any time
- Patients with evidence of a prior COVID-19 inpatient hospitalization
- Use of RDV prior to EUA

Matched Comparator

- RDV-exposed patients were matched 1:1 to referent patients using a 2-stage process to ensure covariate balance:
- **Risk-Set Sample (RSS) matching** to ensure exact balance on key covariates, including
  - Calendar time
  - Patient demographics (age, gender)
  - COVID-19 disease severity (baseline oxygen requirement and ICU status)
  - Number of days between admission and RDV exposure
  - Corticosteroid use
- **Propensity Score (PS) matching** was then conducted to control for confounding using nearest neighbor matching with a ±1% caliper
  - Patient demographics
  - Clinical characteristics
  - Comorbidities
  - Concomitant medications
- PS matching was repeated for each baseline oxygen support subgroup for estimation of subgroup-specific effects

Index date (follow-up start)

- Exposed cohort: RDV initiation date
- Matched referent cohort: index date of the matched exposed patient

Follow-up end

- The RSS procedure ensures that a patient treated with RDV by a certain point during hospital admission is matched to a similar patient who could have been treated with RDV at the same point during hospital admission but was not. Thus, the matched referent group includes not only patients who

Methods (cont'd)

were never exposed to RDV, but also patients who were exposed to RDV later in their hospitalization than their matched RDV exposed patient. Taking this into account, end of follow-up was defined in two ways:

- Primary: As-treated (AT): Patients were censored on earliest of outcome, death, discharge, maximum of 28 days, and RDV crossover date (referent patients only)
- Sensitivity: Intention to treat (ITT): Patients were censored on earliest of outcome, death, discharge, and maximum of 28 days

Statistical analysis

Outcomes

- **Primary outcome:** All-cause mortality
- **Secondary outcome:** Hospital discharge

Subgroup analysis

- We evaluated subgroups of patients by baseline oxygen requirement status, which previous research has shown is an indicator of disease severity:
  - room air
  - low-flow oxygen
  - high-flow oxygen or non-invasive ventilation (NIV)
  - invasive mechanical ventilation (IMV) or extracorporeal membrane oxygenation (ECMO)

Analysis and software

- Hazard ratios (HR) and corresponding 95% confidence intervals (CIs) for the effectiveness of RDV were reported using the PS-matched exposed cohort compared to the matched referent cohort
- Similar to the approach of Garibaldi et al., a landmark analysis approach was adopted for the secondary outcome (hospital discharge), with follow-up lagged to start at Day 5 to account for patients completing the full 5-day treatment course of RDV
  - As an exploratory analysis, the secondary outcome was also examined without the 5-day landmark
- Results were presented overall and by each baseline oxygen support subgroup
- All analyses were conducted using the Aetion Evidence Platform, which has been previously validated

Key Definitions

Covid-19*	Medical Claims or a hospital diagnosis with: • U07.1 - COVID-19, virus identified
Exposure Remdesivir**	Inpatient Hospital Encounter Detail with: • Charge Code (Vendor/Standard): text string includes remdesivir • Procedure Code, ICD-10: XW033E5, XW043E5 (RDV Peripheral/Central Vein)
Primary outcome Mortality*	Inpatient Hospital Encounter with: • Discharge Status: EXPIRED, EXPIRED HOME (HOSPICE), EXPIRED MEDICAL FACILITY (HOSPICE)
Secondary outcome Discharge*	Medical Claims or Inpatient Hospital Encounter with: • Discharge Status: DISCHARGED TO HOME OR SELF CARE (ROUTINE DISCHARGE) • Among patients who did not experience the outcome, die, discharge (other) or cross-over in Days 0-4 from admission – follow-up lagged to Day 5
	Medical Claims or Inpatient Hospital Encounter with: • Discharge Status: DISCHARGED TO HOME OR SELF CARE (ROUTINE DISCHARGE)
Baseline Oxygen Requirement subgroups***	
Room air	Identifies that the following procedures did not occur: ECMO or IMV, high-flow oxygen, Non-invasive ventilation, low-flow oxygen
Low-flow or Any Oxygen	Identifies that the following procedures did occur • Low-flow oxygen • Any oxygen, excluding high-flow, NIV, IMV or ECMO
High-flow or Non-invasive	Identifies that the following procedures did occur • Non-invasive ventilation • High-flow oxygen
Invasive mechanical or ECMO	Identifies that the following procedures did occur • ECMO • Invasive mechanical ventilation

* Measured during the inpatient hospitalization
**Measured during and prior to the inpatient hospitalization
***Measured at RDV start/index date

Covariates Used for RSS- and PS-matching

RSS-matching	• calendar date (±3 days) of RDV initiation of exposed patient • age category of exposed patient • sex of exposed patient • time (categorized days) since hospital admission of exposed patient • ICU status and day prior status of exposed patient • Oxygen support level of exposed patient • Corticosteroid use on index date and day prior
PS-matching	• demographic (sex, age, region) • obesity • oxygen support* • ICU status • number of days since hospitalizations • comorbidities • smoking • factors affecting health status • selected medications

* Oxygen support status was not included in the PS-matching for the oxygen support subgroup analysis.

Results

Patient Characteristics

- Among 60,704 eligible patients in the balanced RSS cohort, 24,856 patients receiving RDV were PS-matched to 24,856 referent patients **(Figure 1)**
- Demographic and clinical characteristics were well balanced between the exposed and matched referent groups, with absolute standardized differences all <0.10 **(Table 1, Table 2, Table 3)**

Figure 1. Patient disposition

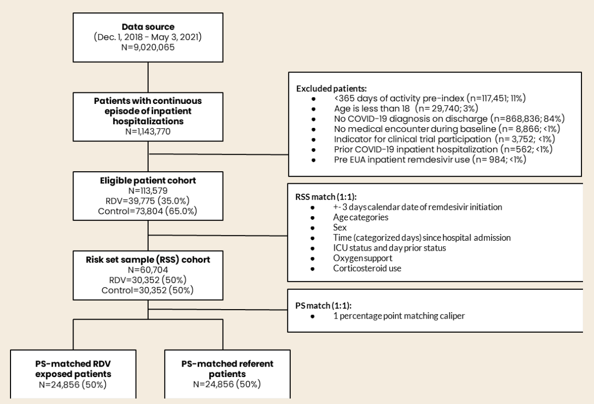

Data source
(Dec. 1, 2018 - May 3, 2021)
N=9,020,065
Patients with continuous episode of inpatient hospitalizations
N=1,143,770
Excluded patients:
<365 days of activity pre-index (n=117,451; 11%)
Age is less than 18 (n= 29,740; 3%)
No COVID-19 diagnosis on discharge (n=868,836; 84%)
No medical encounter during baseline (n= 8,866; <1%)
Indicator for clinical trial participation (n= 3,752; <1%)
Prior COVID-19 inpatient hospitalization (n=562; <1%)
Pre EUA inpatient remdesivir use (n= 984; <1%)
Eligible patient cohort
N=113,579
RDV=39,775 (35.0%)
Control=73,804 (65.0%)
RSS match (1:1):
+-3 days calendar date of remdesivir initiation
Age categories
Sex
Time (categorized days) since hospital admission
ICU status and day prior status
Oxygen support
Corticosteroid use
Risk set sample (RSS) cohort
N=60,704
RDV=30,352 (50%)
Control=30,352 (50%)
PS match (1:1):
1 percentage point matching caliper
PS-matched RDV exposed patients
N=24,856 (50%)
PS-matched referent patients
N=24,856 (50%)

Table 1. Baseline patient characteristics

Demographic Characteristics	RSS Cohort			Propensity score-matched patients		
	RSS-matched RDV (n =30,352)	RSS-matched referent (n =30,352)	Absolute standardized difference	PS-matched RDV (n=24,856)	PS-matched referent (n = 24,856)	Absolute standardized difference
Age			0.001			0.005
Mean (sd)	66.81 (15.32)	66.80 (15.37)		66.84 (15.42)	66.76 (15.37)	
Median [IQR]	67.00 [57.00, 77.00]	67.00 [57.00, 77.00]		68.00 [57.00, 77.00]	67.00 [57.00, 77.00]	
Gender			0.000			0.005
Female; n (%)	14,444 (47.6%)	14,444 (47.6%)		11,917 (47.9%)	11,906 (47.9%)	
Male; n (%)	15,497 (51.1%)	15,497 (51.1%)		12,596 (50.7%)	12,621 (50.8%)	
Unknown; n (%)	411 (1.4%)	411 (1.4%)		343 (1.4%)	329 (1.3%)	
Region			0.223			0.004
Northeast; n (%)	5,665 (18.7%)	4,440 (14.6%)		4,062 (16.3%)	4,095 (16.5%)	
Midwest; n (%)	2,370 (7.8%)	3,776 (12.4%)		2,332 (9.4%)	2,341 (9.4%)	
South; n (%)	13,792 (45.4%)	15,328 (50.5%)		12,235 (49.2%)	12,189 (49.0%)	
West; n (%)	8,514 (28.1%)	6,802 (22.4%)		6,221 (25.0%)	6,225 (25.0%)	
Other/Missing/Unknown; n (%)	11 (0.0%)	6 (0.0%)		6 (0.0%)	6 (0.0%)	
Oxygen Support Status			0.000			0.004
Room air; n (%)	19,445 (64.1%)	19,445 (64.1%)		15,947 (64.2%)	15,967 (64.2%)	
Low-Flow; n (%)	6,550 (21.6%)	6,550 (21.6%)		5,434 (21.9%)	5,402 (21.7%)	
High-Flow or NIV; n (%)	3,405 (11.2%)	3,405 (11.2%)		2,706 (10.9%)	2,721 (10.9%)	
ECMO/IMV; n (%)	952 (3.1%)	952 (3.1%)		769 (3.1%)	766 (3.1%)	

Table 2. Selected baseline comorbidities

Baseline clinical covariates based on CCSR	RSS Cohort			Propensity score-matched patients		
	RSS-matched RDV (n =30,352)	RSS-matched referent (n =30,352)	Absolute standardized difference	PS-matched RDV (n=24,856)	PS-matched referent (n = 24,856)	Absolute standardized difference
Infection; n (%)	15,493 (51.0%)	15,997 (52.7%)	0.033	12,630 (50.8%)	12,613 (50.7%)	0.001
Blood; n (%)	11,122 (36.6%)	13,623 (44.9%)	0.168	9,823 (39.5%)	9,775 (39.3%)	0.004
Diabetes; n (%)	13,204 (43.5%)	14,229 (46.9%)	0.068	11,081 (44.6%)	11,057 (44.5%)	0.002
Metabolic; n (%)	23,269 (76.7%)	23,993 (79.0%)	0.057	19,208 (77.3%)	19,189 (77.2%)	0.002
Obesity; n (%)	10,045 (33.1%)	10,125 (33.4%)	0.006	8,197 (33.0%)	8,185 (32.9%)	0.001
Endocrine; n (%)	7,884 (26.0%)	8,793 (29.0%)	0.067	6,687 (26.9%)	6,655 (26.8%)	0.003
Digestive; n (%)	13,717 (45.2%)	15,281 (50.3%)	0.103	11,657 (46.9%)	11,675 (47.0%)	0.001
Neurologic; n (%)	16,352 (53.9%)	18,285 (60.2%)	0.129	13,991 (56.3%)	14,013 (56.4%)	0.002
Circulatory; n (%)						
- Ischemic heart diseases; n (%)	8,265 (27.2%)	9,881 (32.6%)	0.116	7,236 (29.1%)	7,197 (29.0%)	0.003
- abnormal blood pressure (hyper) n (%)	21,404 (70.5%)	22,728 (74.9%)	0.098	17,921 (72.1%)	17,902 (72.0%)	0.002
- Other and unspecified disorders of the circulatory system; n (%)	7,773 (25.6%)	9,538 (31.4%)	0.129	6,841 (27.5%)	6,805 (27.4%)	0.003
- Other forms of heart disease; n (%)	11,082 (36.5%)	13,506 (44.5%)	0.163	9,804 (39.4%)	9,733 (39.2%)	0.006
- Heart Failure n (%)	5,579 (18.4%)	7,753 (25.5%)	0.174	5,158 (20.8%)	5,095 (20.5%)	0.006
- Conductive disorders, dysrhythmias n	7,627 (25.1%)	9,113 (30.0%)	0.110	6,686 (26.9%)	6,647 (26.7%)	0.004
Renal; n (%)						
- Renal (Acute); n (%)	6,824 (22.5%)	9,123 (30.1%)	0.173	6,172 (24.8%)	6,157 (24.8%)	0.001
- Renal (Chronic); n (%)	6,514 (21.5%)	9,706 (32.0%)	0.239	6,208 (25.0%)	6,151 (24.7%)	0.005
Genitourinary; n (%)	13,653 (45.0%)	15,350 (50.6%)	0.112	11,663 (46.9%)	11,645 (46.8%)	0.001
Respiratory; n (%)	21,203 (69.9%)	21,189 (69.8%)	0.001	17,155 (69.0%)	17,163 (69.0%)	0.001
Mood/Neuro; n (%)	9,385 (30.9%)	10,781 (35.5%)	0.098	8,123 (32.7%)	8,172 (32.9%)	0.004
Smoking; n (%)	8,900 (29.3%)	10,181 (33.5%)	0.091	7,639 (30.7%)	7,641 (30.7%)	0.000
Musculoskeletal/ Connective Tissue; n (%)	17,690 (58.3%)	18,699 (61.6%)	0.068	14,804 (59.6%)	14,741 (59.3%)	0.005
Neoplasms; n (%)	6,410 (21.1%)	6,816 (22.5%)	0.032	5,392 (21.7%)	5,410 (21.8%)	0.002
Other Signs/Symptoms; n (%)	25,968 (85.6%)	26,682 (87.9%)	0.069	21,449 (86.3%)	21,451 (86.3%)	0.000

Table 3. Selected baseline concomitant medications

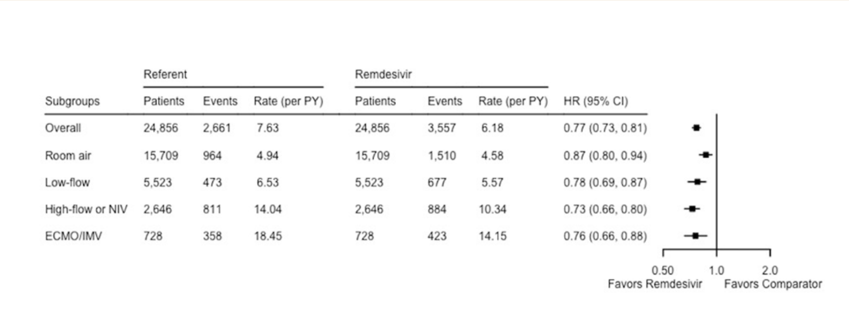
Conncomitant medications	RSS Cohort			Propensity score-matched patients		
	RSS-matched RDV (n =30,352)	RSS-matched referent (n =30,352)	Absolute standardized difference	PS-matched RDV (n=24,856)	PS-matched referent (n = 24,856)	Absolute standardized difference
Corticosteroids; n (%)	21,519 (70.9%)	20,916 (68.9%)	0.043	17,507 (70.4%)	17,459 (70.2%)	0.004
HIV Protease Inhibitors n (%)	23 (0.1%)	34 (0.1%)	0.012	20 (0.1%)	22 (0.1%)	0.003
Hydroxychloroquine/Chloroquine; n (%)	130 (0.4%)	156 (0.5%)	0.013	118 (0.5%)	119 (0.5%)	0.001
Immunomodulators; n (%)	728 (2.4%)	218 (0.7%)	0.136	208 (0.8%)	218 (0.9%)	0.004
Convalescent plasma n (%)	789 (2.6%)	318 (1.0%)	0.116	311 (1.3%)	317 (1.3%)	0.002
Interferon n (%)	23 (0.1%)	12 (0.0%)	0.015	8 (0.0%)	12 (0.0%)	0.008
Tocilizumab; n (%)	563 (1.9%)	205 (0.7%)	0.106	167 (0.7%)	205 (0.8%)	0.018
Siltuximab; n (%)	0 (0.0%)	0 (0.0%)	-	0 (0.0%)	0 (0.0%)	-
Sarilumab; n (%)	0 (0.0%)	0 (0.0%)	-	0 (0.0%)	0 (0.0%)	-
Baricitinib; n (%)	146 (0.5%)	3 (0.0%)	0.095	33 (0.1%)	3 (0.0%)	0.045
Ribavirin; n (%)	0 (0.0%)	4 (0.0%)	0.016	0 (0.0%)	3 (0.0%)	0.016

Results for Primary Outcome

Mortality

- RDV was associated with a statistically significant reduction in mortality in patients hospitalized with COVID-19 **(Figure 2)**.
- Statistically significant mortality reductions were observed in each subgroup of baseline oxygen requirement

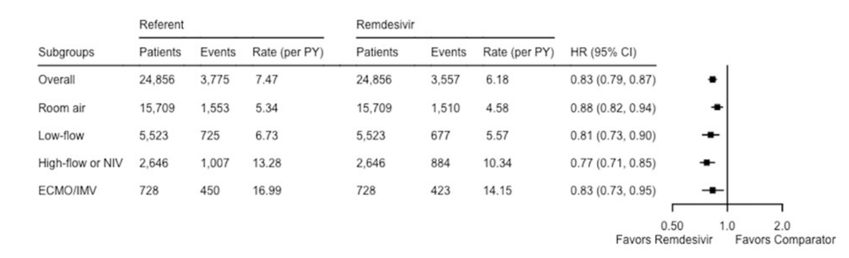
Figure 2. Mortality by baseline oxygen requirement subgroup in the as-treated primary analysis


Referent
Remdesivir
Subgroups | Patients | Events | Rate (per PY) | Patients | Events | Rate (per PY) | HR (95% CI)
Overall | 24,856 | 2,661 | 7.63 | 24,856 | 3,557 | 6.18 | 0.77 (0.73, 0.81)
Room air | 15,709 | 964 | 4.94 | 15,709 | 1,510 | 4.58 | 0.87 (0.80, 0.94)
Low-flow | 5,523 | 473 | 6.53 | 5,523 | 677 | 5.57 | 0.78 (0.69, 0.87)
High-flow or NIV | 2,646 | 811 | 14.04 | 2,646 | 884 | 10.34 | 0.73 (0.66, 0.80)
ECMO/IMV | 728 | 358 | 18.45 | 728 | 423 | 14.15 | 0.76 (0.66, 0.88)
0.50
1.0
2.0
Favors Remdesivir
Favors Comparator

Mortality

- The statistically significant mortality reduction was also observed in the ITT sensitivity analysis, both overall and by subgroup of baseline oxygen requirement **(Figure 3)**.

Figure 3. Mortality by baseline oxygen requirement subgroup in the intention-to-treat sensitivity analysis

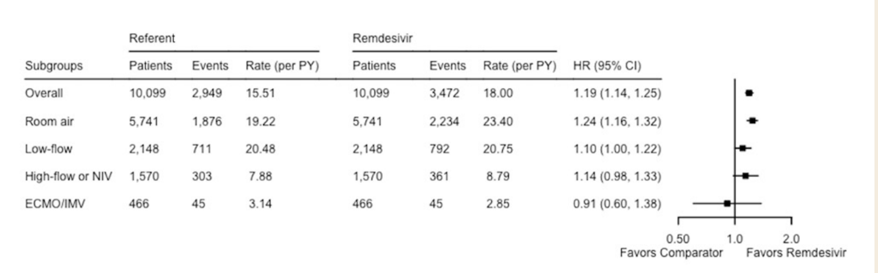

Referent
Remdesivir
Subgroups | Patients | Events | Rate (per PY) | Patients | Events | Rate (per PY) | HR (95% CI)
Overall | 24,856 | 3,775 | 7.47 | 24,856 | 3,557 | 6.18 | 0.83 (0.79, 0.87)
Room air | 15,709 | 1,553 | 5.34 | 15,709 | 1,510 | 4.58 | 0.88 (0.82, 0.94)
Low-flow | 5,523 | 725 | 6.73 | 5,523 | 677 | 5.57 | 0.81 (0.73, 0.90)
High-flow or NIV | 2,646 | 1,007 | 13.28 | 2,646 | 884 | 10.34 | 0.77 (0.71, 0.85)
ECMO/IMV | 728 | 450 | 16.99 | 728 | 423 | 14.15 | 0.83 (0.73, 0.95)
0.50
1.0
2.0
Favors Remdesivir
Favors Comparator

Results for Secondary Outcome

Hospital discharge

- Median (Q1, Q3) observed RDV treatment duration was 5 (4,5) days.
- 5-day landmark analysis showed that treatment with RDV was associated with a statistically significant increased likelihood of hospital discharge, both overall and in patients requiring no oxygen or low-flow oxygen at baseline **(Figure 4)**.
- No discharge benefit was observed in patients on IMV/ECMO at baseline

Figure 4. Hospital discharge with 5-day landmark, by baseline oxygen requirement subgroup in the as-treated primary analysis


Referent
Remdesivir
Subgroups | Patients | Events | Rate (per PY) | Patients | Events | Rate (per PY) | HR (95% CI)
Overall | 10,099 | 2,949 | 15.51 | 10,099 | 3,472 | 18.00 | 1.19 (1.14, 1.25)
Room air | 5,741 | 1,876 | 19.22 | 5,741 | 2,234 | 23.40 | 1.24 (1.16, 1.32)
Low-flow | 2,148 | 711 | 20.48 | 2,148 | 792 | 20.75 | 1.10 (1.00, 1.22)
High-flow or NIV | 1,570 | 303 | 7.88 | 1,570 | 361 | 8.79 | 1.14 (0.98, 1.33)
ECMO/IMV | 466 | 45 | 3.14 | 466 | 45 | 2.85 | 0.91 (0.60, 1.38)
0.50
1.0
2.0
Favors Comparator
Favors Remdesivir

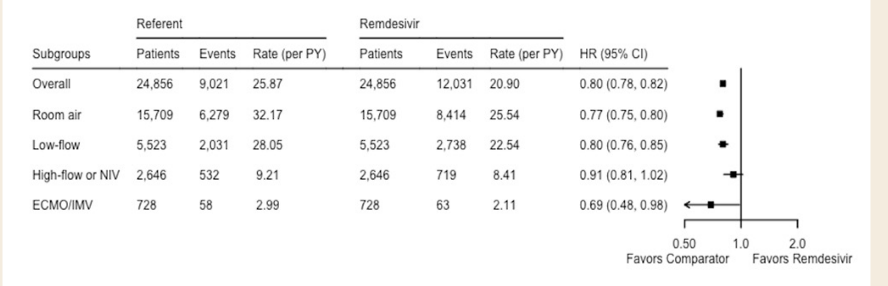
Abbreviations

ACTT-1	Adaptive COVID-19 Treatment Trial
AT	As-treated
CCSR	Clinical Classifications Software Refined
CI	Confidence Interval
COVID-19	Coronavirus disease 2019
ECMPO	Extracorporeal membrane oxygenation
EHR	Electronic health records
EUA	Emergency use authorization
FDA	Federal Drug Administration
HR	Hazard ratio
ICU	Intensive care unit
IMV	Invasive mechanical ventilation
IQR	Interquartile range
ITT	Intent-to-treat
NIV	Non-invasive ventilation
PS	Propensity score
RDV	Remdesivir
RNA	Ribonucleic acid
RSS	Risk-set sample
SD	Standard deviation
US	United States

Hospital discharge

- Exploratory: without accounting for the 5-day treatment course, RDV was associated with reduced likelihood of hospital discharge **(Figure 5)**.

Figure 5. Hospital discharge without 5-day landmark, by baseline oxygen requirement subgroup in the as-treated analysis (Exploratory)


Referent
Remdesivir
Subgroups | Patients | Events | Rate (per PY) | Patients | Events | Rate (per PY) | HR (95% CI)
Overall | 24,856 | 9,021 | 25.87 | 24,856 | 12,031 | 20.90 | 0.80 (0.78, 0.82)
Room air | 15,709 | 6,279 | 32.17 | 15,709 | 8,414 | 25.54 | 0.77 (0.75, 0.80)
Low-flow | 5,523 | 2,031 | 28.05 | 5,523 | 2,738 | 22.54 | 0.80 (0.76, 0.85)
High-flow or NIV | 2,646 | 532 | 9.21 | 2,646 | 719 | 8.41 | 0.91 (0.81, 1.02)
ECMO/IMV | 728 | 58 | 2.99 | 728 | 63 | 2.11 | 0.69 (0.48, 0.98)
0.50
1.0
2.0
Favors Comparator
Favors Remdesivir

Study Considerations

Strengths

- RSS and subsequent PS-matching achieved well-balanced patient populations in both the treatment a nd comparator groups, effectively mitigating potential confounding, selection bias, and immortal time bias.
- Large sample size (N=24,856 RDV) permitted well-powered evaluation of the studied outcomes overall and in subgroups
- The sensitivity analyses using an ITT approach assure that the results are robust to potential misclassification of followup time among referent patients who cross over to RDV
- With a wide range of COVID-19 patients and minimal inclusion/exclusion criteria, these results represent the real world treatment effect in hospitalized US COVID-19 patients

Limitations

- Due to the rapid evolution of patient management during the pandemic and increasing RDV use over time, matched controls could not be identified for some exposed patients. However, the RSS cohort included 76% of all RDV exposed patients, and PS matching captured 82% of those, indicating that the analyzed exposed population represented the majority of RDV exposed patients
- Oxygen supplementation may not be fully captured in chargemaster data, resulting in potential misclassification. Furthermore, determination of 'room air' relied on the absence of recorded procedures for oxygen support.
- Due to the real world nature of the dataset, detailed data such as laboratory measurements and granular changes in oxygen support are difficult to capture broadly
- Despite the analytical methods used, there may be residual or unmeasured confounding

Conclusions

- In this large real world data analysis with 24,856 RDV-exposed patients, RDV was associated with statistically significantly reduced all-cause mortality by day 28 in patients hospitalized with COVID-19
  - This benefit was observed in all baseline oxygen requirement subgroups (room air, low-flow oxygen, high-flow/NIV, and IMV/ECMO)
- RDV was associated with statistically significantly increased likelihood of hospital discharge by day 28 after RDV treatment completion
- These results emphasize the importance of
  - large sample sizes to observe treatment effects consistently
  - employment of robust methods to ensure balance between exposed and referent patients in comparative effectiveness studies using real world data
- Overall, these findings are consistent with the results from randomized well-controlled trials and support the clinical benefits of treatment with RDV in patients hospitalized with COVID-19

References

1. Beigel JH, et al. ACTT-1 Study Group Members. Remdesivir for the Treatment of Covid-19 - Final Report. N Engl J Med. 2020 Nov 5;383(19):1813-1826. doi: 10.1056/NEJMoa2007764. Epub 2020 Oct 8. PMID: 32445440; PMCID: PMC7262788.
2. Bradley MC, et al. 2021 FDA SCIENCE FORUM: Categorization of COVID-19 Severity to Determine Mortality Risk. Accessed 8 June 2021. Available from: https://www.fda.gov/science-research/fda-science-forum/categorization-covid-19-severity-determine-mortality-risk.
3. Garibaldi BT, Wang K, Robinson ML, et al. Comparison of Time to Clinical Improvement With vs Without Remdesivir Treatment in Hospitalized Patients With COVID-19. JAMA Netw Open. 2021;4(3):e213071. doi:10.1001/jamanetworkopen.2021.3071.
4. Wang SV, et al. Transparency and Reproducibility of Observational Cohort Studies Using Large Healthcare Databases. Clin Pharmacol Ther. 2016 Mar;99(3):325-32. doi: 10.1002/cpt.329. PMID: 26690726; PMCID: PMC7833029.

Please also see the following posters at WMF for additional real world data analyses of RDV:

- 7863 (Remdesivir Treatment is Associated with Improved Survival in Hospitalized Patients with COVID-19)
- 8439 (Remdesivir vs Standard of Care for Severe COVID-19

Presented at World Microbe Forum, June 20-24, 2021