International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 14, No. 3, March 2025 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_14.3.2025.35

ORIGINAL RESEARCH

Comparison of outcomes with remdesivir along with standard care and standard care alone in moderate to severe COVID-19patients in a tertiary care hospital

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Received: 28 January, 2025 Accepted: 25 February, 2025 Published: 07 March, 2025

ABSTRACT

Background: The aim was to compare outcomes with remdesivir along with standard care and standard care alone in moderate to severe COVID-19 patients in a tertiary care hospital. **Method**: A retrospective observational study was conducted by collecting data of moderate to severe COVID-19 patients admitted to covid wards of a tertiary care hospital for a period of six months. Demographic data, information about SpO2 changes, duration of hospitalization, marker status and ventilation status were parameters collected and used to compare between two groups. **Results**: Total number of patients in this study was 112. Out of which 56 patients who were on Remdesivir with standard care belonged to group A and 56 patients receiving standard care alone belonged to group B. In group A 47 were males and 9 females. In group B 40 were males and 16females. Mean age in group A was 55.98 ± 12.95 (with age range 33 – 84 y)) and in group B 44.11 ± 16.04 (15 - 74 y). Patients in group A showed more presence of comorbidity (55.4%) as compared to group B (17.9%). Mean SpO2 level on day 1 in group A was 87.68 ± 4.27 and in group B 90.00 ± 5.37. On day of discharge mean SpO2 level was 94.63 ± 1.77 in group A and87.68 ± 4.27in group B. Mean length of hospital stay in group A was 4.45 ± 2.36 and 9.86 ± 6.91 in group B. Improvement in marker status for group A was 96.4% and group B 83.9%. Ventilation status was 100% improvement in group A and 94.6% in group B. **Conclusion**: Remdesivir did not show a significant improvement in management of moderate to severe COVID-19 patients when compared to standard care.

Keywords: COVID-19, Methylprednisolone, Dexamethasone, Moderate to severe

INTRODUCTION

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. Because of its contagious nature, it had a catastrophic effect on the world. Thus, WHO declared it a global pandemic on March 11, 2020.[1] Over 760 million cases and 6.9 million deaths have been recorded worldwide.[2]

Covid-19 infected patients often develop atypical pneumonia, acute lung injury, and acute respiratory distress syndrome.[3]The clinical disease can be mild, moderate, or severe. Moderate and severe cases with oxygen saturation < 92% require hospitalization, ventilation, standard care, and remdesivir.[4,5]

Remdesivir, a nucleotide analog, is an inhibitor of viral RNA synthesis. It is a prodrug metabolized in the liver to form an active nucleoside triphosphate analogue. It has selectivity over ATP substrate for incorporation into viral RNA chains by SARS-CoV-2 RNA-dependent RNA polymerase.[6,7]

FDA approved remdesivir for emergency use authorization in the treatment of COVID-19 in May 2020.[8] The recommended dosage of remdesivir in COVID-19 in adults is a single loading dose of 200 mg on day 1 followed by once-daily maintenance doses of 100 mg from day 2 up to day 5.[9]Some studies have shown that remdesivir treatment improved the

DOI: 10.69605/ijlbpr_14.3.2025.35

clinical condition of COVID-19 patients, and reduced the hospital stay and duration of oxygen need, whereas some clinical trials did not show significant benefits with remdesivir use.[10,11]

Hence in this study, we intend to compare the efficacy of remdesivir and standard care with standard care alone in moderate to severe COVID-19.

MATERIALS AND METHODS

This retrospective observational study was conducted over six months (April to September 2021) in the Covid ward at KIMS, Hubli, tertiary care hospital. The study was approved by the institutional ethics committee.

All moderate to severe COVID-19 patients aged more than 18 years of either sex admitted to covid ward with or without comorbid conditions receiving either remdesivir and standard care or standard care alonewere included in the study. Patients with immunodeficiency disorders and those not willing to participate in this study were excluded. The record of patients with moderate to severe COVID-19 was obtained and the data was collected. Demographic data, information about SpO2 changes, duration of hospitalization, marker status, and ventilation status were the parameters collected. The patients will be divided into two groups. Those who received remdesivir along with standard care belonged to Group A and those who received only standard care belonged to Group B.

Statistical analysis

Data for study parameters were entered in Microsoft-excel and analysis was done using, IBM SPSS statistics (version 23.0). Demographic characteristics and other parameters between study groups were compared by Mann-Whitney test and Chi-square test. Independent student T-test was used for the comparison of mean SpO2 levels between the 2 groups.

RESULTS

Among 112 patients included in this study, 56 patients who were treated with Remdesivir with standard care belonged to group A and the other 56 patients who received only standard care belonged to group B.

The mean age in Group A was significantly higher 55.98 ± 12.95 (with an age range between 33-84 years) as compared to Group B 44.11 ± 16.04 (15-74 years). This difference was statistically significant p<0.001.

In both study groups, males were predominantly distributed (83.9% in Group A & 71.4% in Group B) as compared to their female counterparts (16.1% in Group A & 28.6% in Group B). There was no significant difference between the two groups p=0.11.

Patients in Group A showed a higher proportion of presence of comorbidity (55.4%) as compared to Group B (17.9%). The difference was statistically significant p<0.001.

The mean SPO2 level on day 1 in Group A was significantly lesser (87.68 ± 4.27) as compared to Group B (90.00 ± 5.37). This difference was statistically significant at p=0.01. And the mean SPO2 level on the day of discharge in Group A was 94.63 ± 1.77 and in Group B was 95.20 ± 6.61. There was no significant difference between the two groups p=0.53.

The mean SPO2 level in Group A on the day of discharge was significantly higher (94.63 ± 1.77) as compared to the day 1 (87.68 ± 4.27). The difference was statistically significant p<0.001.

Similarly, the mean SPO2 level in Group B on the day of discharge was significantly higher (95.20 ± 6.61) as compared to day 1 (90.00 ± 5.37). The difference was statistically significant at p<0.001.

The mean length of hospital stay in Group B was significantly lesser (4.45 ± 2.36) as compared to Group A (9.86 ± 6.91). This difference was statistically significant p<0.001.

Group A showed a 96.4 % improvement in the marker status and Group B showed an 83.9% improvement with a 5.4% worsening of the scores. The marker status evaluation was not performed in 3.6% in Group A & 10.7% in Group B. The difference showed a borderline significance of p=0.06.

Improvement in the ventilation status in Group A was 100.0% & in Group B 94.6%. However, in Group B 5.4% of the patients did not show any change in the ventilation condition. This difference was not statistically significant p=0.08.

Table 1: Age and gender distribution among 2 groups

Variable	Category	Group A		Group B		P-Value
		Mean	SD	Mean	SD	
Age	Mean	55.98	12.95	44.11	16.04	<0.001*[a]
	Range	33 - 84		15 - 74		
		n	%	n	%	
Sex	Males	47	83.9%	40	71.4%	0.11[b]
	Females	9	16.1%	16	28.6%	

DOI: 10.69605/ijlbpr_14.3.2025.35

Table 2: Comparison of presence of comorbidity among study patients between 2 groups using Chi-Square Test

Variable	Category	Group A		Group B		P-Value
		Mean	SD	Mean	SD	
Comorbidity	Yes	31	55.4%	10	17.9%	<0.001*
	No	25	44.6%	46	82.1%	

Table 3: Comparison of mean SPO2 levels between 2 groups on Day 1 & last day using Independent Student t Test

Time	Group	N	Mean	SD	Mean Diff	p-value
Day 1	Group A	56	87.68	4.27	-2.32	0.01*
	Group B	56	90.00	5.37		
Last Day	Group A	56	94.63	1.77	-0.57	0.53
	Group B	56	95.20	6.61		

Table 4: Comparison of mean SPO2 levels between Day 1 & last day in each group using Student Paired t Test

Groups	Time	N	Mean	SD	Mean Diff	p-value
Group A	Day 1	56	87.68	4.27	-6.95	<0.001*
	Last Day	56	94.63	1.77		
Group B	Day 1	56	90.00	5.37	-5.20	<0.001*
	Last Day	56	95.20	6.61		

Table 5: Comparison of mean Length of Hospital Stay between 2 groups using Mann Whitney Test

Time	Group	N	Mean	SD	Mean Diff	p-value
Hospital stay	Group A	56	9.86	6.91	5.41	<0.001*
	Group B	56	4.45	2.36		

Table 6: Comparison of Marker status among study patients between 2 groups using Chi Square Test

Variable	Category	Group A		Group B		P-Value
		Mean	SD	Mean	SD	
Marker	Improved	54	96.4%	47	83.9%	0.06
	Worsened	0	0.0%	3	5.4%	
	Not done	2	3.6%	6	10.7%	

Table 7: Comparison of ventilation status among study patients between 2 groups using Chi Square Test

Variable	Category	Group A		Group B		P-Value
		Mean	SD	Mean	SD	
Ventilation	Improved	56	100.0%	53	94.6%	0.08
	Didn't change	0	0.0%	3	5.4%	

DISCUSSION

Remdesivir was previously used for the Ebola virus and coronaviridae family (SARS and MERS). [12]

In our study, SpO2 on the day of discharge was higher compared to day 1 in patients who received remdesivir along with standard care compared to patients who were treated only with standard care.

A systematic review and meta-analysis of 8 randomized trials found that remdesivir reduces mortality for patients requiring supplemental oxygen therapy.[13]

In the ACTT-1 trial, daily infusion of remdesivir in COVID-19hospitalized patients reduced the time to recovery compared to placebo. The most common adverse effects found were decreased GFR, anemia, hyperglycemia, pyrexia, and increased blood creatinine.[14,15]

Wang et al reported that clinical improvement with remdesivir was seen in patients who started treatment within 10 days of the onset of symptoms than those who started later.[16]

A study by Spinner et al reported that a 10-day course of remdesivir did not have a statistically significant difference in clinical status compared to standard care on the 11th day of treatment.[17]

Our results didn't show any significant difference in outcome in both groups.

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CONCLUSION

From this study, we can conclude that there was no significant difference in length of hospital stay and improvement in marker and ventilation status between both groups of patients. However, there was an improvement in mean SpO2 on the day of discharge compared to day 1 with remdesivir treatment. Thus, remdesivir did not play a significant role in improving the overall health of COVID-19 patients when compared to the standard care of treatment.

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