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**ORIGINAL ARTICLE**

# Evaluation of the Remdesivir Treatment of Non-Hospitalized Patients with COVID-19

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## ABSTRACT

Novel corona virus 2019 has resulted in a pandemic which killed over five million people worldwide. It causes acute respiratory syndrome and is reported to affect multi-organ system. Various variant of corona virus (COVID-19) has been emerged in various regions of the world as a result of mutation in original strains. The Purpose of the Current Study to evaluate the effect of Remdesivir for treating non-hospitalized patients with COVID-19 at the Department of Medicine PIMS Hospital from 1st January 2021 to 30th June 2021. In the Current Research One hundred patients were enrolled and divided into group A and group B within the age of 24-70 years. Group A was receiving Remdesivir while group B is not receiving Remdesivir. The clinical variables, BMI, Comorbidities, duration of disease severity and viral load were determined. RT-PCR was conducted to determine viral load. The mean age of study participants was 50±15 years with greater number of males. Diabetes was the major comorbidity. The time duration was decreased in group A upto 5 days and 8 days in group B. The viral load was decreased by mean value 6.32±1.76 to 6.2±1.78 in group B then group A respectively and result show that Remdesivir is effective in COVID-19 treatment.

**Keywords:** Remdesivir, COVID-19, Viral load

## INTRODUCTION

The corona virus disease 2019 (COVID-19) outbreak was first described in Wuhan city, Since December 2019, the whole world is confronted with the problem of corona-virus pandemics and its effects on the people and their social life has been incredible. Every part of the world is virtually hit by COVID-19 infection. Most of the COVID-19 fatalities were aged people followed by the result of high death ratios as shown in data [1]. Corona virus is a (+) strand enclosed RNA virus with the biggest genome of all RNA viruses. The coronavirus's RNA is polyadenylated and capped, and the genomic RNA is packed and enclosed by a nucleocapsid and an extra layer of envelop. Furthermore, the corona virus envelop contains unique glycolproteins such as hem agglutinin–acetyl esterase (HE) glycoprotein, various membrane glycoproteins, and spike glycoprotein. Which emerge from the envelop forming a crown-like shape[2]. Corona virus genome contains replicase genes with overlapping open reading frames (ORF1a and ORF1b) that can encode various non-structural proteins, as well as structural genes for Envelop, Spikes, membrane proteins, and nucleocapsid [3].It causes acute respiratory syndrome and is reported to affect multi-organ system. Various variant of corona virus (COVID-19) has been emerged in various regions of the world as a result of mutation in original strains [1].The best-known treatment by now is vaccination which saves from hospitalization and critical condition in majority of the cases [4].Older people and those with Comorbidities have higher risk of mortality or critical condition due to this disease. The main Comorbidities include diabetes, cardiovascular disease or any disease which caused an immunocompromised state in them [5 Remdesivir is an anti-viral prodrug inhibitor, which direct acts on viral nucleotide such as of SARS-CoV2. It inhibits the RNA dependent RNA polymerase activity [6]. Studies regarding the effect of Remdesivir have been researched extensively and have documented the fact that the patients with the course of ten days and a course of five days presented length shortening of the disease, in most of hospitalized and non-hospitalized cases [7]. Early initiation of treatment including anti viral drugs has been known to improve the health outcomes. Similar plan has been planned for COVID-19 to reduced clinical conditions and mortality [8].The current study was planned for examining the effect of Remdesivir on efficacy of treatment of non- hospitalized patients. The findings of this study will assist in finalizing the treatment plan for COVID-19 patients who are not hospitalized but are suffering from mild to moderate disease condition.

## MATERIAL AND METHOD

The Current Research is a retrospective survey-based study which was conducted in the Department of Medicine at PIMS Hospital from 1st January 2021 to 30th June 2021.There were 100 study participants were analyzed for their treatment and recovery. Fifty patients were put in Group A while other 50 patients were placed in Group B. The group A had those patients who were treated with Remdesivir between 5-10 days depending on their level of severity while in Group B patients never took the Remdesivir as for treatment of their COVID-19 infection. The data was collected from the community through the help of government COVID-19 testing program as after collecting address records from them each patient was approached in their house holds for gaining the information regard his/her treatment plan, time of recovery, severity of disease, obesity, hypertension, diabetes, immunocompromised status, cardiovascular disease: post their disease clearance. The research was strictly conducted after the approval of Hospital Administration. Each participant of the study or their guardians was explained about the importance of this research and their written informed consent was obtained pre-enrolment. Real time PCR was conducted to assess the viral load in both groups after day 5 of disease. Data was recorded and analyzed by using SPSS version 25.0 where Chi square test was used as well as mean and standard deviation. P value less than 0.05 was considered significant.

## RESULTS

The present study had 50±15 mean age of the patients with no significant difference between the groups. However, there were more patients in group A and B such as 84% and 80% in age group <50-70years respectively. As it was a research which took data from government testing department therefore, the frequency of confirmed cases of COVID-19 within young age were comparatively low. There were 66% males and 34% females confirmed with COVID-19 (Table 1).

The BMI level of group A showed obesity status in those who were given Remdesivir in their COVID treatment in comparison to significantly low (P<0.05) in non-Remdesivir group B. The comorbidity diabetes was reported highest in group A

followed by obesity and hypertension, whereas, in group B similar findings were observed in context to their Comorbidities status. There were 4%, 2% and 2%, 0% immune-comprised or cancer patients in group A and B respectively (Table 2).

Table 1: Distribution of age and gender (n=100)

| Variables | Remdesivir | No Remdesivir | total |
|---|---|---|---|
| Age (years) | | | |
| ≥25-49 | 8 (16%) | 10 (20%) | 18 (18%) |
| <50-70 | 42 (84%) | 40 (80%) | 82 (82%) |
| Gender | | | |
| Male | 30 (60%) | 36 (72%) | 66 (66%) |
| Female | 20 (40%) | 14 (28%) | 34 (34%) |

Table 2: Distribution of Comorbidities in enrolled patients

| Variables | Remdesivir | No Remdesivir | Total |
|---|---|---|---|
| Body-mass index ($kg/m^2$) | 31.3±6.7 | 24.9±5.8 | 28.1±6.25 |
| Coexisting morbidities | | | |
| Diabetes mellitus | 31 (62%) | 30 (60%) | 60 (61.5%) |
| Obesity | 27 (54%) | 28 (56%) | 55 (55%) |
| Hypertension | 25 (50%) | 24 (48%) | 49 (49%) |
| Current cancer | 1 (2%) | --- | 1 (1%) |
| Cardiovascular disease | 9(18%) | 4 (8%) | 13 (13%) |
| Immune compromise | 2 (4%) | 1 (2%) | 3 (3%) |
| Chronic kidney disease, mild or moderate | 1 (2%) | 2 (4%) | 3 (3%) |

The duration of disease severity was decreased with the mean value of 5 days in group A which was given Remdesivir, then the mean value of 8 in group B which were not given Remdesivir treatment (Table 3)

Table 3: Comparison of duration of time between the groups

| Variables | Remdesivir | No Remdesivir | Total |
|---|---|---|---|
| Median duration of symptoms before first infusion (IQR) – days | 5 (3–7) | 8 (3-11) | 6.5 (3–9) |
| Median time since RT-PCR confirmation of SARS-CoV-2 (IQR) - days | 2 (1–3) | 3 (1–3) | 2 (1–3) |

RT-PCR values showed mean decrease in viral load of group A patient' by 6.32±1.76 in comparison with group B by 6.2±1.78 value (Fig. 1).

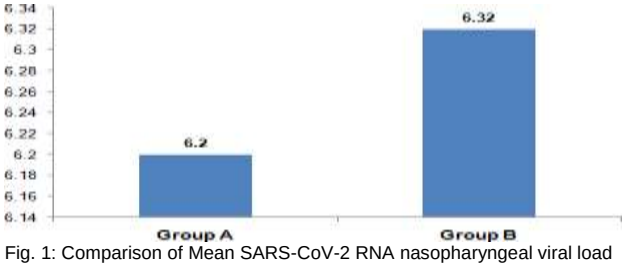


Fig. 1: Comparison of Mean SARS-CoV-2 RNA nasopharyngeal viral load

## DISCUSSION

Corona virus is an emerged pandemic, causing millions of casualties in 2 years. Its symptoms ranging from mild cough and flue to multi organ and life threatening complications and disorders [9]. Several anti-viral drugs and vaccinations have made to combat its deadly consequences. Remdesivir is considered an effective anti-viral drug against COVID-19 treatment. Studies have highlighted that Remdesivir is proved beneficial in reducing and in the treatment of severe COVID patient [10].Trials proved that, 87% of the risks associated or death with COVID was reduced after taking Remdesivir for three days in severe COVID-19 patients in contrast to placebo in which reduction of complications is seen in 81% of the patients [11,12]. Results related to Comorbidities related to COVID was also showed beneficial results in Remdesivir group and risk of COVID related hospitalization was also decreased in this group as compared to placebo. An acceptable safety result profile was obtained in Remdesivir given patients and similar adverse events were observed that to placebo group [13,14]. Result of this study is also in accordance with the previous literature [15,16]. Remdesivir showed shorter time to recovery and lower chances of other Comorbidities in previous studies than to the placebo. Similar has been observed in the present study [17,18]. Few studies also showed some conflicting results [19, 20]. On the other hand, several findings suggest that, safety profile of Remdesivir was also comparable or to somewhat similar to placebo [21,22].Furthermore, This Research Shows greater Remdesivir efficacy in earlier start of COVID-19 treatment.

## CONCLUSION

The Present Research Conclude that Remdesivir is an efficient anti-viral drug in COVID-19 patients which reduces the duration of disease in addition to the mean viral load.

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