

BRIEF COMMUNICATION

COVID-19 and the Unseen Benefits of Dexamethasone

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Abstract

According to current World Health Organization (WHO) updates, the COVID-19 pandemic has spread all over the globe, affecting 216 countries, and has caused 8,860,331 confirmed cases and 465,740 deaths as of June 24, 2020. Many countries cannot afford nucleic acid tests to confirm COVID-19 infection; as a result, people cannot know the COVID-19 status of the people living around them. The use of dexamethasone

in COVID-19 hospitalized patients for up to 10 days lowered 28-day mortality compared to patients receiving standard of care plus mechanical ventilation at randomization (by 12.3 age-adjusted percentage points, approximately one-third of proportional reduction) and patients receiving oxygen without invasive mechanical ventilation (by 4.1 age-adjusted percentage points, approximately one-fifth of proportional reduction).

Introduction

According to World Health Organization (WHO) current updates, the COVID-19 pandemic has spread all over the globe affecting 216 countries and caused 8,860,331 confirmed cases and 465,740 deaths last followed by 24 June 2020.[1] Many countries cannot afford the nucleic acid tests to confirm COVID-19 infected patients; as a result, people cannot know the COVID-19 status of the people living around them.

Since the last century with the advent of technology and advancement, it was barely rare to see such pandemic. It has been a new, unique, and challenging condition for the whole world including Science. America being the technology king and one of the developed countries had worst affected by this virus. Currently, the registered confirmed cases in America are 2,241,178 with 119,453 deaths. Brazil has been affected as the second most country with registered cases of 1,067,579 with 49,976 deaths. Russian Federation is the third country with registered cases 592,280 with 8,206 deaths.[1] The overall global count for the cases is 8,860,331 with 465,740 deaths (**Figure 1**). Interestingly all these conditions are developed and highly technologically advanced countries. Pakistan is also affected very badly by the current virus. The first case was reported on 26 February 2020 and it is increasing exponentially and now the active number of cases are 181,088 and 3,590 deaths were reported to WHO on

June 22, 2020.[1] The government has taken substantial measurements and Quarantine has been established in major emergency centers, but still, the cases of COVID-19 have increased very rapidly.

Methods

The COVID-19 infection spread from person to person; therefore, the affected COVID-19 patients are kept in isolation where they are given treatments. Currently, no specific antiviral drugs or vaccines are available for treating COVID-19. The COVID-19 patients are given empiric therapy which includes HIV protease inhibitors and also broad-spectrum antiviral drugs like nucleoside analog that could attenuate the infection until the availability of specific antiviral drugs.[2]

The WHO also recommends convalescent plasma for the treatment of COVID-19 patients. But recently, the promising results of the clinical trials of dexamethasone in the United Kingdom were welcomed by WHO. The dexamethasone, a corticosteroid, can be life-saving for seriously ill COVID-19 patients.[3] The preliminary reports shared with the WHO showed that dexamethasone reduced mortality by one third in patients on ventilators, and by one fifth in patients requiring only oxygen. The effectiveness of this drug was only observed in critically ill COVID-19 patients and was not reported in patients with milder symptoms of the disease. The WHO Director-General, Dr. Tedros Adhanom Ghe-

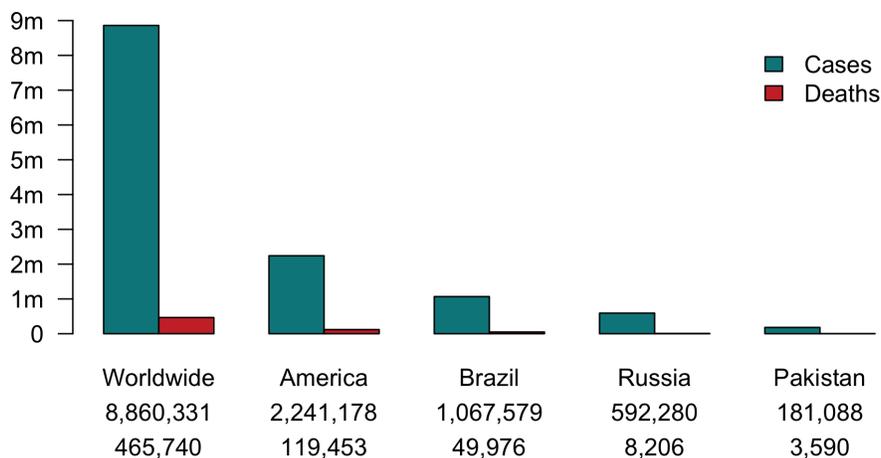


Figure 1. Current status of COVID-19 across the globe.

breyesus has said that it is the first drug to have reduced mortality in patients in COVID-19 patients on ventilators or requiring oxygen.[3]

Results

Dexamethasone, steroid, that reduces inflammation (the main cause of death in COVID-19 patients, lungs swells during the fight with the virus) has been used in different conditions like certain cancers and inflammatory disorders since the 1960s. It has been included in the WHO Model List of Essential Medicines, in many formulations since 1977, and is currently affordable and off-patent in most of the countries.[3]

Advantages of dexamethasone

It has been shown that dexamethasone saves lives: a clinical trial over 4 weeks in the Oxford University observed that it reduced the mortality rate by 35% in COVID-19 patients on ventilators and 20% in those who needed oxygen only. Studies have shown that this drug would prevent the death of 1 patient for every 8 COVID-19 patients on ventilators and 1 for every 25 COVID-19 patients who need supplemental oxygen only. Another key advantage of this drug is that it is cheap and easily available in most of the countries worldwide.

Side effects of dexamethasone

Dexamethasone is an only useful drug for treating critically ill COVID-19 patients, but there are some side effects of using steroids, including water retention, weight gain, high blood pressure, sleep problems, mood changes, and raise the blood sugar level in diabetic patients. However, some researchers have also reported that the mortality rate was high during a clin-

ical trial: the mortality rate in COVID-19 patients on ventilators and oxygen alone were 41% and 25% respectively. This mortality rate seems higher than in the United States, where recently mortality rate of 12% was found, although it was only 2 weeks versus 4 in the United Kingdom study, said Dr. Peter Bach a health policy expert at Memorial Sloan-Kettering Cancer Centre in New York.

Discussion

The preliminary results of a study conducted by Group (Table 1) showed that the use of dexamethasone in COVID-19 hospitalized patients for up to 10 days lower 28-day mortality as compared to the patients taking usual care and also receiving mechanical ventilation at randomization (by age-adjusted percentage points 12.3, approximately one third of proportional reduction) and those patients receiving oxygen without invasive mechanical ventilation (by age-adjusted percentage points 4.1, approximately one fifth of proportional reduction).

However, they did not note any evidence of dexamethasone benefits in those patients that were not receiving any respiratory support at randomization, and the findings were similar with the possible harm in this subgroup. In all those patients of COVID-19 having common inflammatory lung damage and they were treated for more than 07 days after onset of symptoms, the use of dexamethasone was also found to be effective.[4]

Recently, another trial was conducted in which the patients having acute respiratory distress syndrome and also receiving mechanical ventilation, the mortality at 60 days was 15% lower in the dexamethasone group as compared to the other group receiving usual care.[5] These findings are also parallel to the results of

Table 1. Dexamethasone in COVID-19 Hospitalized Patients.[4]

	Standard of care (n=2,104)	Dexamethasone (n=2,104)	Risk/rate ratio [95% CI]
Primary outcome			
Mortality at 28 days	1,110/4,321 (25.7)	482/2,104 (22.9)	0.83 [0.75–0.93]
Secondary outcomes			
Discharged within 28 days from the hospital	2,745/4,321 (63.5)	1,413/2,104 (67.2)	1.10 [1.03–1.17]
Invasive mechanical ventilation	285/3,638 (7.8)	102/1,780 (5.7)	0.77 [0.62–0.95]
Death or invasive mechanical ventilation	994/3,638 (27.3)	456/1,780 (25.6)	0.92 [0.84–1.01]
Deaths	827/3,638 (22.7)	387/1,780 (21.7)	0.93 [0.84–1.03]

Abbreviations: CI, confidence interval.

* Frequency/total (%).

Group.[4]

These trials provide evidence that all COVID-19 patients that receiving respiratory support, when treated with a dose of 6 mg once daily at least for up to 10 days with dexamethasone reduces 28-day mortality. They did not found any benefit and also the harm possibility among all those patients who did not need any kind of respiratory support.[4]

So, dexamethasone is now present on the essential medicines list of WHO and easily available throughout the world at minimum price.

The National Institutes of Health (NIH) in the USA and the chief medical officers of U.K issued and updated guidelines to recommend the use of glucocorticoids in COVID-19 hospitalized patients.[4]

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References

1. Coronavirus disease (COVID-19). Situation Report. Geneva, Switzerland: World Health Organization, 2020 22 June 2020. Report No.: 154.
2. Rothan HA, Byrareddy SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. *J Autoimmun* 2020; 109:102433. doi: 10.1016/j.jaut.2020.102433. PMID: 32113704.
3. World Health Organization. WHO welcomes preliminary results about dexamethasone use in treating critically ill COVID-19 patients. Available at: <https://www.who.int/news-room/detail/16-06-2020-who-welcomes-preliminary-results->

1. [about-dexamethasone-use-in-treating-critically-ill-covid-19-patients](#). Accessed 24 August 2020.
4. Horby P, Lim WS, Emberson JR, et al. Dexamethasone in hospitalized patients with COVID-19. *N Engl J Med* 2021; 384(8):693-704. doi: 10.1056/NEJMoa2021436. PMID: 32678530.
5. Villar J, Ferrando C, Martínez D, et al. Dexamethasone treatment for the acute respiratory distress syndrome: A multicentre, randomised controlled trial. *Lancet Respir Med* 2020; 8(3):267-76. doi: 10.1016/s2213-2600(19)30417-5. PMID: 32043986.