

## **CORTICOSTEROID THERAPY AND COVID-19**

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### **ABSTRACT**

While acknowledging the recommendations to administer corticosteroids for fetal lung maturation when preterm delivery is anticipated, one must also consider the renin-angiotensin-aldosterone system, which is closely linked to the pathophysiology. Corticosteroids do not directly attack the viruses, rather act via anti-inflammatory and immunosuppressive properties to minimize the damage created all over the body. The anti-inflammatory activity of glucocorticoids is attributed to the repression of pro-inflammatory genes through signal transduction by their steroid receptors.

**Keyword:** Corticosteroid , therapy , COVID-19.

### **1. INTRODUCTION**

Coronavirus disease 2019 (COVID-19) is an emerging infectious disease that was first reported in late December 2019, in Wuhan, China, and has subsequently spread worldwide<sup>(1)</sup>.

The disease has clinical manifestations ranging from asymptomatic, mild pneumonia to serious acute respiratory distress syndrome (ARDS), septic shock, and multiple organ dysfunction syndrome. The mainstay of management of patients with COVID-19 is supportive therapy<sup>(2)</sup>. Due to a lack of definitive treatment, many drugs were repurposed for COVID-19 treatment; among them, corticosteroid. Corticosteroids have been widely used during the previous outbreaks of SARS, MERS, severe acute respiratory syndrome (SARS); Middle East respiratory syndrome (MERS) and are currently used in patients with COVID-19, although their benefit-to-risk ratio remains controversial<sup>(3)</sup>.

Corticosteroids do not directly attack the viruses, rather act via anti-inflammatory and immunosuppressive properties to minimize the damage created all over the body. The anti-inflammatory activity of glucocorticoids is attributed to the repression of pro-inflammatory genes through signal transduction by their steroid receptors. Glucocorticoids inhibit nuclear transcription factor- $\kappa$ B (NF- $\kappa$ B) signaling and further inhibit the transcription and translation of inflammatory factors. Thus, the anti-inflammatory mechanism is the basis for using it in various medical conditions including bacterial or viral pneumonia<sup>(2)</sup>.

Several retrospective studies have been published on the use of corticosteroids in patients with COVID-19<sup>(4-9)</sup> and revealed that treatment with corticosteroids may be reduced the risk of death,

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improve prognosis and promote clinical recovery especially in patients with severe COVID-19.

In contrast to above studies, many studies reported no beneficial effect of the use of corticosteroids on clinical outcomes in COVID-19 patients treated with glucocorticoids<sup>(10,11)</sup>. Other study demonstrated that treatment with corticosteroids was associated with a higher risk of progression of severity and prolonged hospital stay<sup>(12)</sup>. Another study reported an increased risk of super-infection in patients with COVID-19 receiving steroids as is seen in influenza pneumonia<sup>(13)</sup>.

On 2 September 2020, the World Health Organization (WHO) published guidance for clinicians and healthcare decision makers on the use of corticosteroids in patients with COVID-19. The guidance recommends to use systemic (i.e. intravenous or oral) corticosteroid therapy (e.g. 6 mg of dexamethasone orally or intravenously daily or 50 mg of hydrocortisone intravenously every 8 hours) for 7 to 10 days in patients with severe and critical COVID-19, and not to use corticosteroid therapy in patients with non-severe COVID-19, as the treatment brought no benefits, and could even prove harmful<sup>(14)</sup>.

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