



## REVIEW ARTICLE

# Oxidative Stress Associated with SARS-Cov-2 (COVID-19) Increases the Severity of the Lung Disease - A Systematic Review

Samir Derouiche<sup>1,2\*</sup> 

<sup>1</sup>Department of Cellular and Molecular Biology, El-Oued University, Algeria

<sup>2</sup>Laboratory of Biodiversity and Application of Biotechnology in the Agricultural Field, Faculty of Natural Sciences and Life, University of El Oued, Algeria

\*Corresponding author: Samir Derouiche, Department of Cellular and Molecular Biology, Faculty of Natural and Life Sciences, El-Oued University, El Oued 39000, El Oued, Algeria; Laboratory of Biodiversity and Application of Biotechnology in the Agricultural Field, Faculty of Natural Sciences and Life, University of El Oued, El-Oued 39000, Algeria



## Abstract

COVID-19 patients have a higher risk of developing inflammatory responses associated with serious and even fatal respiratory diseases. This review focuses on the relationship between oxidative stress and COVID-19. Coronaviruses are a family of common RNA viruses that can cause serious lower respiratory tract infections, followed by bronchitis and pneumonia. Pulmonary inflammation, fever and fibrosis are symptoms of COVID-19 mediated by cytokine pro-inflammatory. Oxidative stress affect repair mechanisms and the immune control system, which is one of the main events of the inflammatory response which allows us also to conclude that oxidative stress is a major factor increasing the severity of COVID-19 especially during chronic diseases associated with the fragility of the antioxidant system, suggesting to recommend antioxidants supplementation in therapeutic strategies against COVID-19.

## Keywords

Inflammatory response, Oxidative stress, Antioxidant therapy, SARS-CoV-2

## Background

SARS-CoV-2, the virus responsible for COVID-2019 for (Coronavirus disease 2019) is a new coronavirus discovered in the city of Wuhan in Hubei province in China in December 2019 ref. COVID-19 has been described as a pandemic by the WHO from the date March 11, 2020, the first triggered by a coronavirus [1]. Coronaviruses are enveloped RNA viruses belonging to the

family of Coronaviridae, genus betacoronavirus [2]. In humans, SARS-CoV-2 (COVID-19) has identified as the seventh now pathogenic Coronavirus for humans after other coronavirus species which are: seasonal HCoV, SARS-CoV, MERS-CoV [3]. Whereas coronavirus 2 (SARS-CoV-2) causes a severe acute respiratory syndrome that spreads worldwide [4]. According to the guidelines of the World Health Organization (WHO), the communicability, severity and impact of the disease are the criteria for assessing the severity of pandemic influenza [5]. Communicability reflects the movement of the virus, which is influenced by the dynamics of spread [6]. The lungs are the preferred target of COVID-19 by the large area exposed to viruses, they are among the most oxygenated organs in the human body [7]. Multiple lung disease including apnea causes alveolar hypoventilation, vasoconstriction of the pulmonary artery and cyclic changes in hypoxemia contribute to increased production of reactive oxygen species (ROS) characteristic of the condition oxidative stress [8]. Oxidative stress is an important factor causing metabolic and physiological alterations and various diseases in the body [9]. COVID-19 attack triggers inflammatory reaction which releases pro-inflammatory cytokines characteristic of acute lung damage [10]. A great association between the pro-inflammatory elements and the reactive oxygen species (ROS) in the different lung disease including Coronavirus infection which is associated with inflammation and