

# Overview of Severe Acute Respiratory Syndrome Corona Virus 2; Current Evidence and Prospects

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## Abstract

Coronavirus disease 19 (COVID-19) was first reported in December 2019 in China. Since then, the disease has caused 139,378 deaths worldwide, and the numbers are on the rise. This literature review describes COVID-19 in a variety of aspects including age and symptomatology, mortality risks, countries preventive measures advantages and disadvantages, ways to optimize controls by testing and hospitals anticipation, Intensive care units (ICU) approach to treatment for better outcomes, role of cardiopulmonary resuscitation, and health care worker protection importance, currently used treatments and their effectiveness. Community education, providing the correct information to unify our message about this pandemic, is vital. Finally, it is unquestionable that further optimal research is needed to guide to the best medical practice in preventing, diagnosing, and treating COVID-19.

**Keywords:** COVID-19; Fever; Intensive Care Units; Treatment Approaches; Preventive Measures

**Abbreviations:** ICU: Intensive Care Units; HCW: Health Care Workers; CPR: Cardiopulmonary- Resuscitation; PCR: Polymerase Chain Reaction; ARDS: Adult Respiratory Distress Syndrome; PEEP: Positive End-Expiratory Pressure

## Introduction

The first case of Coronavirus disease 19 (COVID-19) was in thirty-one December 2019 in Wuhan, China. It affects 2,074,529 people causing 139,378 deaths worldwide [1]. The majority of cases have mild to moderate disease status, while 14% of cases have severe disease status, and only 5% are in critical disease status [2]. This review aims to present an overview of COVID-19 from its occurrence until the current management and prospects. The literature review will attempt to describe the current aspects of COVID-19. Firstly, who are the patients at increased risk of mortality from COVID-19? Second, what are the presenting symptoms of COVID-19? Examples of preventive measures in countries with an increased risk of transmission in the absence of symptomatology take place next. Third, why do numbers keep rising despite preventive measures? With an elaboration of the importance of testing to control the pandemic situation. Fourth, how many ventilators do we need for COVID-19? The importance of protecting health care workers (HCW) takes place afterward with a discussion of the current evidence in dealing with COVID-19 from intensive care units (ICU) point of view. Additionally, cardiopulmonary- resuscitation (CPR) and its difficulties are discussed hereafter. Lastly, existing treatments and their effects on COVID-19 are elaborated with prospects.

## Age and Risk of the Disease

The cases of COVID-19 rise on daily bases in many countries worldwide. However, the current view of the case fatality rate is 6.72% worldwide [1]. The mean age of presentation is 44.2 years (standard deviation 13.2), yet cases are reported from all ages up to 99 years old [3].

## Who are the Patients at Increased Risk of Mortality from COVID-19?

The risk of having COVID-19 appears to be similar in men and women as the male to female ratio is 1.08 [2]. Furthermore, it was found that most deaths occurred among patients  $\geq 80$  years old and patients with comorbidities. This shows that the risk of mortality is higher in weakened immune status, whereas potent immune patients have a strong tendency toward recovery.

## What are the Presenting Symptoms of COVID-19?

Many patients acquire the virus and do not present with symptoms, as it was reported in 13% of patients [4]. Nevertheless, presenting symptoms vary, with the majority presenting with fever (82%) followed by cough (61%), fatigue (36%), dyspnea (26%), headache (12%), sore throat (10%) and gastrointestinal symptoms (9%).

## Preventive Measures and its Importance

The absence/complexity of symptoms may have a role in increasing transmission risks, which led many organizations to establish safety measures in order to minimize transmission and preventing an overflow of cases to hospitals to optimize hospital care. For example, the kingdom of Saudi Arabia withheld Umrah for all people on the 5<sup>th</sup> of March 2020, followed by the closure of air travels, gathering locations, and other sectors on the 15<sup>th</sup> of March 2020. Currently, there are 7,142 cases, 87 deaths, and 1047 recovered patients with COVID-19 in Saudi Arabia [5]. It is probable that such preventive measures, especially the holy sites, may have played a role in decreasing the current reported cases. Also, it is arguable that the low reported deaths could be attributed to age, as the median age in Saudi Arabia is thirty years old [6].

## Why do Numbers Keep Rising despite Preventive Measures?

China was the first country to encounter COVID-19. We could note that they may have succeeded temporarily to limit the virus. However, we could see that cases rose in China despite preventive measures. Many patients had symptoms in China before the outbreak was detected [7]. The publication reported the number of cases with the virus, yet it is important to signal that this number does not reflect the actual number of cases, as they could be much higher. We think that all countries must estimate the actual number of cases COVID-19. Thus, testing modalities and the capacity of hospitals is adapted.

## Testing Importance to Control the Pandemic Situation

The testing availability is an important pillar to diagnose and treat infected individuals and protect uninfected individuals. A publication reported countries ranking and availability of testing per one million population [8]. Iceland is shown to be the best country in the availability of testing, while Saudi Arabia has a limited testing capacity as many other countries. Nations should step up their testing to achieve optimal control of cases for the time being. The only present available testing for COVID-19 is polymerase chain reaction (PCR) as many countries are in progress of finding an alternative modality given their limited sources; chest x-ray has been found to be sensitive yet not specific for diagnosis [9].

## How many Ventilators do we need for COVID-19?

Looking at the current pandemic worldwide, it is vital to anticipate approximately the number of ventilators needed. Generally, up to 10% of hospital admissions require ICU beds [10]. Without a doubt, the percentage may increase in elderly patients, especially in the presence of comorbidities. Furthermore, a recent case series in the Seattle region investigated twenty-four admissions to ICU, 18 patients (75%) needed ventilator support [11]. Another report in the United Kingdom of 5578 patients with COVID-19 found that 68.6% of patients needed ventilators with the majority requiring respiratory support [12]. Similarly, an Italian study of 1591 patients found that 70% needed respiratory support [13]. The majority of patients in ICU in their study had comorbidities, and they were older than 50 years old [13]. Thus, it is essential to plan for these percentages in countries that have not reached these values, and if reached ICU team organization and adaptation should be established if feasible.

## The Importance of Protecting Health Care Workers (HCW)

HCW protection is another critical entity to efficient practice and spread prevention of the disease. 29% of COVID -19 were HCW in a study in Wuhan, China [14]. Emergency care and ICU teams are one of the main frontlines identifying and treating this condition. Thus, adequate protection protocols in each hospital are mandatory to minimize transmission to HCW and other uninfected hospitalized patients.

## Current Evidence in dealing with COVID-19 from ICU Point of View

One of the main reasons that lead to patient's admission to ICU is moderate to severe hypoxia. More or less, many patients with COVID- 19 are treated as adult respiratory distress syndrome (ARDS). Statistical significance with better outcomes is found in ARDS ventilator support with low volume in each breath as protection of undamaged alveoli is established [15]. On the other hand, low or high positive end-expiratory pressure (PEEP) has no difference in statistical significance [16]. Moreover, prone positioning of patients with ARDS improved survival significantly than supine positioning [17]. Looking back at the United Kingdom study of outcomes in COVID-19 with intubation, 51% did not survive. Similarly, The Italian study documented only 26% without survival, yet 58% of intubated patients are still in ICU. Thus, it is critical to know the status of survival in the remaining patients to achieve a better comparison if applicable. Also, it is arguable that not all COVID -19 patients and ARDS, as reported [18]. This may have had an impact on the survival of patients in ICU.

## What about CPR in COVID-19 Patients?

A study investigated CPR outcomes in patients with COVID-19 [19]. Out of 136 patients, only one patient survived with favorable neurological outcome. Asystole was found in the majority of those patients. It is unknown if such outcomes were as a result of delayed recognition or not. This could signify the difficulty in doing CPR, given the risk of transmission to HCW. Thus, doing CPR by HCW is possible if the protection of the HCW is optimized and anticipated.

## Existing Treatments and Future Prospects

The cure for COVID-19 has not been established yet. However, many centers worldwide are in progress to achieve this objective. Current antiviral treatments are inconclusive. Hydroxychloroquine is another treatment yet not clinically proven to treat the virus; however, it is currently allowed for emergency use administration [20,21]. We agree that properly randomized control trials are needed for proper management [3]. Finally, the COVID-19 vaccine is one of the most reliable methods to prevent the disease, as seen by many validated vaccines for other bacterial or viral infections. However, until now, there is no vaccine. Surely, there will be a COVID-19 vaccine in the future as organizations are in the process of its development.

Finally, educating the community by guidance to the right source of information is vital, following the ministry of health guidelines and other reliable sources of information is highly essential to unify the message and collaborate to protect ourselves and neighbors.

## Conclusion

COVID-19 has a life span like many other pandemics that ended from existence. We, as medical practitioners and community members, have the possibility to eradicate the virus slower or faster depending on our uniformity, starting by the transmission of the message followed by researching and applying the best evidence. With an optimal understanding of preventive measures and testing to estimate the actual number of cases, we would have an anticipated plan for our hospitals, intensive care units, HCW, and patients with or without coronavirus disease ultimately, leading to better outcomes from all aspects.

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