

# Coronavirus Disease 2019 Symptoms on First Wave and Second Wave: An Overview

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## ABSTRACT

During this decade, a fast spreading threat coronavirus has to infect human populations. This virus was first identified in Wuhan, China, in humans exposed to a seafood market. The virus is officially called 2019-novel coronavirus. The studies conducted during its initial outbreak show that human-to-human transmission was limited or non-existent, but it was not a correct assumption. Recently, the virus is reported in almost all the countries and territories. It is the third epidemic caused by coronavirus in the 21<sup>st</sup> century, already surpassing severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) in the number of individuals infected. The World Health Organization (WHO) reported that as of 6:19 pm CEST, June 11, 2021, there have been more than 174 million confirmed cases of coronavirus disease 2019 (COVID-19), including more than 3 million deaths, reported to the WHO. Many research works have been published and actively conducting on the threatening spread of the virus. The main symptoms of COVID-19 included fever, fatigue, and cough, which are similar to that of SARS-CoV- and MERS-CoV-infected cases. Much literature reported various symptoms of COVID-19, but the comprehensive review is few. The purpose of the paper is primarily to review the symptoms of different waves of COVID-19 infection. Awareness of the COVID-19 symptoms may help in early diagnosis, to control virus spread, and risk stratification.

**Keywords:** Coronavirus disease 2019, Post-coronavirus disease 2019 symptoms, Symptoms of coronavirus disease 2019 first wave, Symptoms of coronavirus disease 2019 second wave, Symptoms of coronavirus disease 2019

*Asian Pac. J. Health Sci.*, (2021); DOI: 10.21276/apjhs.2021.8.4.32

## INTRODUCTION

In late December 2019, several local health centers reported clusters of patients with pneumonia of unknown cause that was linked to a seafood and wet animal wholesale market in Wuhan, Hubei Province, China.<sup>[1]</sup> The coronavirus outbreak came to light when China informed the World Health Organization (WHO) on December 31, 2019, of a cluster of an unknown disease called pneumonia of unknown cause occurred in Wuhan City, China. The new disease began to spread to more states in China and also to the rest of the world. Subsequently, the WHO declared it as a pandemic. The virus has been named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the disease is now called coronavirus disease 2019 (COVID-19). The WHO reported that as of 6:19 pm CEST, June 11, 2021, there have been more than 174 million confirmed cases of COVID-19, including more than 3 million deaths, reported to the WHO.<sup>[2]</sup> The world is now shrunk to a global village because of the fast development in the area of science and technology and IT. The people is traveling frequently to every nuke and corner of the world and since China being the industrial hub of the world it is quite natural that the traffic to and fro from China has been increased at a very fast pace, the virus could reach to every corner of the world very fast like a wild fire. COVID-19 affects people in different ways. During the first wave, most of the infected people is effected only a mild-to-moderate illness and recover without hospitalization. However, in the second wave, the spreading rate and mortality rate are increased.<sup>[3]</sup> Baud *et al.* presented a paper by showing the real mortality rate in their studies using WHO data on the cumulative number of deaths to March 1, 2020, mortality rates would be 5.6% (95% CI 5.4–5.8) for China and 15.2% (12.5–17.9) outside of China. They have calculated the global mortality rates overtime using a 14-day delay estimate and shown in their work.<sup>[4]</sup> Some common symptoms have been identified in COVID-19 patients, but new symptoms are

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**How to cite this article:** Jamsheela O. Coronavirus Disease 2019 Symptoms on First Wave and Second Wave: An Overview. *Asian Pac. J. Health Sci.*, 2021;8(4):160-162.

**Source of support:** Nil

**Conflicts of interest:** None.

**Received:** 20/06/21 **Revised:** 17/07/21 **Accepted:** 20/08/21

also identified in the patients affected with mutated coronavirus. Here, an overview of the various COVID-19 symptoms is included. The new SARS-CoV-2 is a fast spreading virus. Therefore to restrain the spread of the virus, a transparent and authenticated understanding of the symptoms is very important to take proper cares and to implement guidelines for quarantining and testing.

Here, symptoms have been reviewed as three groups such as symptoms in the first wave, symptoms in the second wave, and post-COVID-19 symptoms. The first section contains reviews from the earlier published articles, that is, papers published up to March 2020. In the second section, symptoms in the second wave, the published work after March 2020 and up to 2021 is reviewed.

## COVID-19 SYMPTOMS: AN OVERVIEW

Coronaviruses are positive single-stranded RNA viruses surrounded by an envelope and belong to the family *Coronaviridae*. They are grouped into four genera: Alpha, Beta, Gamma, and Delta coronavirus. Seven human coronaviruses which fall within the Alpha and Beta coronavirus genera have been identified till now.<sup>[5]</sup> People with COVID-19-infected patients may show various

symptoms, including cough, vomiting, nausea, arthralgia, fever, myalgia, dyspnea, fatigue, headache, diarrhea, breathing issues, and rarely arthritis.<sup>[6]</sup>

### Symptoms Reported During the First Wave

Chen *et al.* published an article on January 30, 2020, by showing the symptoms of COVID-19 infected patients in a hospital in China.<sup>[7]</sup> The authors have collected details of 99 patients. The paper shows that out of 99 patients with 2019-novel coronavirus (nCoV) pneumonia, 49 (49%) had a history of exposure to the Huanan seafood market. Patients had fever (82 [83%]), cough (81 [82%]), shortness of breath (31 [31%]), muscle ache (11 [11%]), confusion (9 [9%]), headache (8 [8%]), sore throat (5 [5%]), rhinorrhea (4 [4%]), chest pain (2 [2%]), diarrhea (2 [2%]), and nausea and vomiting (1 [1%]).<sup>[7]</sup>

Another study is published in February 2020 by showing the symptoms of COVID-19 infected patients by analyzing 138 hospitalized patients.<sup>[8]</sup> In the article, the authors state that the most common symptoms were fever (136 [98.6%]), fatigue (96 [69.6%]), dry cough (82 [59.4%]), myalgia (48 [34.8%]), and dyspnea (43 [31.2%]).<sup>[8]</sup> Less common symptoms were headache, dizziness, abdominal pain, diarrhea, nausea, and vomiting. A total of 14 patients (10.1%) initially presented with diarrhea and nausea 1–2 days before development of fever and dyspnea.<sup>[8]</sup> Compared with the non-intensive care unit (ICU) patients, patients admitted to the ICU were more likely to report pharyngeal pain, dyspnea, dizziness, abdominal pain, and anorexia.

The clinical features of COVID-19 range from asymptomatic patients to acute respiratory distress syndrome and multiple organ dysfunction. Another study is conducted in Shanghai by Chen *et al.*<sup>[9]</sup> In their findings, fever was occurred in 94.3% of patients. Patients who were transferred to ICU had significantly longer duration of fever as compared to those not in ICU. About 86.3% of patients had been discharged after average 16 days of hospitalization.<sup>[9]</sup> The article is published in March 2020.

It has also been reported that clinical symptoms associated with 2019-nCoV infection includes uncomplicated illness such as viral infection, cough, sore throat, malaise, nasal congestion, headache, muscle pain or malaise non-productive cough, dyspnea, myalgia, fatigue, normal or decreased leukocyte counts, radiographic evidence of pneumonia, and organ dysfunction fever.<sup>[10]</sup> These patients do not have any signs of dehydration, sepsis, or shortness of breath.<sup>[10]</sup>

Another work is published during the earlier stage of the COVID-19 infection and states that the most common symptoms at onset of illness were fever, cough, dyspnea, and myalgia or fatigue. The less common symptoms were sputum production, headache, hemoptysis, and diarrhea. In this study, the data of the first admitted 41 patients in China have been collected and analyzed. More than half of patients developed dyspnea. The median duration from illness onset to dyspnea was 8.0 days. The median time from onset of symptoms to first hospital admission was 7.0 days, to shortness of breath was 8.0 days, to mechanical ventilation was 10.5 days, and to ICU admission was 10.5 days.<sup>[11]</sup>

### Symptoms Reported During the Second Wave

A study states that as an early marker for COVID-19 infection, important changes in an individual's resting heart rate are suggested by the description of 5700 patients hospitalized with

COVID-19. The article reports that at the time of admission, a greater percentage (43.1%) of individuals had a heart rate of >100 b.p.m. and only 30.7% had a fever.<sup>[12]</sup>

An article shows that the 11 common symptoms of COVID-19 patients are fever, cough, shortness of breath, myalgia, malaise, sore throat, and nasal symptoms such as runny nose, sneezing, congestion, and sinus symptoms; gastrointestinal symptoms, rash, anosmia/ageusia (i.e., loss of smell/loss of taste), and headache.<sup>[13]</sup>

Another review is conducted on the data set of 24,410 COVID-19 patients from nine countries. The authors confirmed that the purported cardinal symptoms of fever and a new persistent cough are indeed the most prevalent symptoms of COVID-19 worldwide. However, their study shows that at approximately 1 in 5 test-positive adults were never febrile and fewer than 3 in 5 developed a cough. The most prevalent symptoms were fever, cough, and fatigue.<sup>[14]</sup>

A research study is conducted by comparing the first and second waves of COVID-19 patients in Spain. The findings shows that the most frequent signs and symptoms in both waves are fever, dyspnea, pneumonia, and cough, and the most relevant comorbidities were cardiovascular diseases, type 2 diabetes mellitus, and chronic neurological diseases. Patients from the second wave more frequently presented renal and gastrointestinal symptoms. The authors state that several differences in mortality risk factors were also observed during the study. The analysis shows that hospitalized patients in the second wave were younger, required fewer days of hospitalization, and had lower mortality rates and treatments were more effective and less intensive. The study observed that the chronic neurological diseases in this second wave should be given more importance.<sup>[15]</sup>

A cross-sectional study is conducted from November to December 2020 with a total of 176 adult COVID-19 patients. In this analysis, 76.7% were symptomatic patients and the most common presenting symptoms were fever 43.2%, loss of smell 42.0%, and cough 25.6%. The prevalence of comorbidity in COVID-19 patients was 35.8% and the most common comorbidities were hypertension 19.9%, heart diseases 9.7%, and diabetes mellitus 9.1%, respectively. As a severity, 23.3% of patients had signs of pneumonia. The associated factors of pneumonia were aged 60 years and older, overweight or obese, current smoking, and alcohol drinking. About 30% of symptomatic patients present with pneumonia. The authors states that the COVID-19 patients who are aged 60 years and older, overweight or obese, current smokers, and alcohol drinkers should be monitored carefully during the course of treatment to reduce the disease severity.<sup>[16]</sup>

### Post-COVID-19 Symptoms

From April 21, 2020, to May 29, 2020, a research study is conducted on 143 COVID-19 patients to analyze the symptoms after the virus infection.<sup>[12]</sup> The mean age of the patients' is 56.5. During hospitalization, 72.7% of participants had evidence of interstitial pneumonia.

The post-COVID symptoms were assessed a mean of 60.3 days after onset of the first COVID-19 symptom. The authors state that only 18 (12.6%) patients were completely free of any COVID-19-related symptom, while 32% of the patients had one or two symptoms and 55% had three or more symptoms. None of the patients had fever or any signs or symptoms of acute illness. Worsened quality of life was observed among 44.1% of patients.

The analysis result shows that a high proportion of patients still reported fatigue (53.1%), dyspnea (43.4%), joint pain, (27.3%) and chest pain (21.7%).<sup>[17]</sup>

To analyze the post-COVID-19 symptoms, a study with 287 recovered COVID-19 patients has been conducted by Kamal *et al.*<sup>[18]</sup> Out of the 287 patients, 70.7% of the patients have no known history of other illnesses, while 7.7% have hypertension and 5.2% were diabetic. The authors find that during the disease, 90.6% of patients were receiving multivitamins (natural or pharmaceutical products) as a nutritional support. The study shows that that only 10.8% of the patients have no manifestation after recovery from the COVID-19 infection, but a large percentage of patients suffered from several symptoms.

The findings of the study are revealed that around 73% of patients suffered from fatigue, 38% of patients have anxiety, joints pain is reported in 31.4% of patients, around 29% of patients are suffering continuous headache, 29% of patients have chest pain, dementia reported in 28.6% of patients, depression in 28.6% of patients, and dyspnea found in 28.2%. Among the few recovered patients, 2.4% have newly diagnosed with diabetes. About 67.6% of the patients recovered from post-COVID-19 manifestations, however, 32.4% of patients have persistent manifestations. The severity of post-COVID-19 manifestations was related to the severity of COVID-19.<sup>[18]</sup>

## CONCLUSION

Here, the symptoms of two COVID-19 waves and post-COVID-19 symptoms are presented. Although the majority of symptoms are similar in both periods, gastrointestinal symptoms, renal problems, and breathing problems are seen more in the second wave. It is difficult to predict future prospects. The assumption is that the COVID-19 is not going to disappear in the short or medium period of time. New or mutated virus variants may appear. It is not possible to continue with the strict lockdowns for a very long period. Only the vaccination process can control the virus spread and mortality rate. Each country is expecting a third wave, and the overall analysis of the symptoms indicates that the characteristics of the infection may slightly vary overtime.

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