



1 EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS

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MODULE 1: EPIDEMIOLOGY AND CLINICAL CHARACTERISTICS

WHAT'S NEW?

Update January 2021

Updated figures for asymptomatic patients, pre-symptomatic patients, and infection fatality ratio.

KEY RECOMMENDATIONS

The mean incubation period for COVID-19 is 4-5 days. However, patients may be infectious for 2-3 days prior to the onset of symptoms.

The strongest risk factor for severe disease is advanced age. Other risk factors include cardiopulmonary comorbidities, obesity, HIV and diabetes mellitus.

The spectrum of COVID-19 clinical presentations include asymptomatic infection, a respiratory tract infection that may range from mild to severe, and atypical manifestations such as diarrhoea, skin manifestations, hyperglycaemic syndromes and large vessel strokes

SARS-CoV-2 is a betacoronavirus closely related to SARS-CoV and MERS-CoV. It is an enveloped, non-segmented, positive-sense RNA virus. It is thought to have originated in bats but the animal responsible for transmission to humans remains unknown.

EPIDEMIOLOGY

The median incubation period for COVID-19 is estimated to be 4-5 days, with an interquartile range of 2-7 days. Based on patients' viral-shedding patterns and on epidemiological modelling, patients appear to be infectious for 2-3 days prior to the onset of symptoms, and the contribution of pre-symptomatic infections to the overall pandemic may be substantial.¹⁻⁷ The basic reproductive number for the virus is approximately 2.2 (meaning that on average each person spreads the infection to two others).⁸ A male preponderance of cases has been noted globally both in terms of absolute case numbers, and in severe disease.⁹⁻¹¹ Risk factors for severe disease include older age, cardiopulmonary comorbidities, obesity, HIV and diabetes mellitus. Very few cases requiring hospitalisation have been reported among children under the age of 15 years (.1%).

CLINICAL CHARACTERISTICS – WHAT TO LOOK FOR

Truly asymptomatic COVID-19 patients (as distinguished from pre-symptomatic patients) comprise approximately 20% of COVID-19 cases.¹²⁻¹⁴ However, around half of patients who are asymptomatic at the time of diagnosis are actually pre-symptomatic.^{15,16} Among symptomatic patients in China, 81% developed mild disease, an estimated 14% developed severe disease (with hypoxaemia, marked tachypnoea and extensive lung infiltrates), while 5% became critically ill (with respiratory failure, septic shock and/or multi-organ dysfunction).¹⁷ Because of the strong effect of age on disease severity, the proportions of mild, severe and critical cases seen in a country will partially depend on that country's population age structure.

The most common presenting symptom has been fever in approximately 90%, but importantly this may only be present in a minority of patients on admission.^{11,18} A cough is present in two-thirds of patients, but sputum production is only reported by one third of patients, as is dyspnoea. Myalgia, a sore throat, nausea, vomiting and diarrhoea are all present in less than one-fifth of cases.^{11,18,19} Anosmia (loss of sense of smell) and dysgeusia (alteration of the sense of taste) have also emerged as relatively common, early and moderately specific symptoms.^{20,21} Atypical manifestations are increasingly being recognised, including large vessel strokes in young patients, diabetic ketoacidosis/hyperglycaemic hyperosmolar syndrome, unexplained abdominal pain and various dermatological manifestations.^{22,23}

Abnormalities are visible on chest X-ray in at least 60% of hospitalised COVID-19 patients, with chest CT scans being more sensitive.^{11,18,24} These are typically bilateral, patchy, ground-glass opacities, though other patterns have been described.^{11,25} However, a normal chest X-ray or chest CT scan does not rule out COVID-19. This is especially true of patients with mild disease, in whom a majority of chest X-rays may be normal.²⁶

OUTCOMES AND PROGNOSIS

The vast majority of cases will make a full recovery, although this may take several weeks, particularly in severe cases. In a minority of cases, COVID-19 has been associated with rapid progression to acute respiratory distress syndrome (ARDS), multiple organ failure and, sometimes, death. Internationally, the case-fatality ratio has ranged between 0.7-7%, and is partially determined by the particular population's age distribution, the pandemic's burden on the healthcare system at the time, and the extent to which mild or asymptomatic cases are diagnosed.^{9,27} The infection-fatality ratio (which includes both asymptomatic and symptomatic patients) is estimated at around 0.8% overall, though again there is substantial age-related variability, from <1 per 10,000 cases in those less than 30 years to 12% in those over 80 years of age.²⁸ Full recovery from COVID-19 may take several weeks, and in a minority, symptoms can persist for >1 month (now often referred to as 'long-COVID', see Module 11). A multisystem inflammatory syndrome resembling Kawasaki Disease has also been described, occurring almost exclusively in patients aged <21 years ('MIS-C syndrome'), and typically appearing 2-3 weeks after the primary infection.²⁹

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