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COVID-19: A GP's Perspective

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ABSTRACT

There is a pandemic of coronavirus disease (COVID-19). It is an infectious disease caused by the new coronavirus, a highly contagious virus. The most common symptoms of COVID-19 are fever, tiredness and dry cough. Most people (about 80%) usually recover from the infection. COVID-19 is a new disease and new data is coming out every day. The general practitioner (GP) is not actively involved in management of active cases. But, as the first point of contact, a GP has an important role in preventing its spread by prompt detection and timely referral of suspected cases. Hence, it is important for the GP to be aware of the key aspects of the disease.

Keywords: Coronavirus, dry cough, fever, general practitioner

The coronavirus disease (COVID-19) pandemic emerged from Wuhan, China, where few cases of viral pneumonia were detected on 31st December, 2019.[1] Initially called "pneumonia of unknown etiology",[2] the disease has been termed as Coronavirus disease-2019 (COVID-19) by the World Health Organization (WHO) following identification of a new coronavirus (2019-nCoV) as the cause. The virus has now been officially named the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) because of its genetic similarity (86%) with SARS-CoV.[3]

BURDEN OF DISEASE

The coronavirus outbreak was declared a pandemic on 11th March, 2020. Since then, the pandemic has been "accelerating" (WHO); the first 1 lakh cases were reached in 67 days, 2nd 1,00,000 cases in 11 days, 3rd 1,00,000 cases in 4 days, 4th 1,00,000 cases in 3 days, 5th 1,00,000 cases in 2.5 days, 6,00,000 in 2 days and 7,00,000 in 2 days.

The total number of cases and deaths outside China now exceed those in China. The epicenter of the pandemic shifted from China to Europe (March 13) and now the United States has become the epicenter of the coronavirus pandemic (March 26) with the highest number of coronavirus cases, followed by Italy and Spain.

Global Scenario

Total coronavirus cases	Total deaths	Recovered
2,000,943	1,26,781	4,84,979

Source: https://www.worldometers.info/coronavirus/#countries. Accessed April 15, 2020.

India Scenario

Total coronavirus cases	Total deaths	Recovered
11,555	396	1,362

Source: https://www.worldometers.info/coronavirus/country/india/. Accessed April 15, 2020.

ROUTES OF TRANSMISSION

When it was first detected, COVID-19 was linked to the Huanan seafood wholesale market in Wuhan and therefore presumed to have been transmitted from animals to humans. But, person-to-person transmission was soon confirmed to be the primary mode of transmission.

Person-to-person Transmission

The COVID-19 virus spreads from person-to-person mainly via respiratory droplets expelled from the mouth and nose when the infected person coughs or sneezes or just talks.[4] Droplets are >5 μm in diameter and are transmitted only over a limited distance (e.g., ≤1 m).[5]

These droplets land on objects and surfaces around the person. Indirect spread can occur by touching the surface or object that has the virus on it and then touching the mouth, nose or possibly the eyes (CDC). The virus was found to survive on various surfaces up to 17 days after cabins of both symptomatic and asymptomatic infected passengers were vacated (before

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disinfection) on the Diamond Princess cruise ship.[6] The COVID-19 virus can survive up to 72 hours on plastic and stainless steel, for 4 hours on copper and for up to 24 hours on cardboard.[7]

People can also acquire the virus if they directly breathe in the droplets. This is why, it is important to stay more than 1 meter (3 feet) away from a person who is coughing or sneezing.[8] This is the rationale of social distancing, which is recommended to stop the spread of the infection.

Airborne transmission of COVID-19 has not yet been reported. But, procedures that produce aerosols such as endotracheal intubation, bronchoscopy, open suctioning, disconnecting the patient from the ventilator, may increase the likelihood of airborne transmission.[4] Airborne transmission occurs via droplet nuclei, which are <5 μm in diameter, can remain in the air for long periods of time and be transmitted over distances >1 m.[4]

The COVID-19 virus has been isolated from stool, but there have been no reports of fecal-oral transmission of the COVID-19 virus to date.[4]

Transmission of infection from an asymptomatic contact has also been reported.[9]

Vertical Transmission

Although cases of the new coronavirus in newborns have been reported from China and the UK, mother-to-child transmission is yet to be confirmed. A series of 9 pregnant women found no evidence to suggest that intrauterine infection may result from affected women due to vertical transmission. All samples examined (amniotic fluid, cord blood, breast milk, and neonatal throat swab samples) tested negative for the virus.[10]

CLINICAL PRESENTATION

The incubation period for COVID-19 is 1-14 days, usually around 5 days (WHO). Hence, those who may have been exposed to the virus will present with symptoms on the 5th day of the exposure. This is why, close contacts of COVID-19 patients are tested between 5 to 14 days.

SPECTRUM OF ILLNESS

Most infections are self-limiting. The illness is severe in the elderly and in those with comorbidities. The severity of illness can be categorized as follows:[11]

- Mild illness in 81% patients
- Severe illness (hypoxemia, >50% lung involvement on imaging within 24 to 48 hours) in 14%
- Critical disease (respiratory failure, shock, multiorgan failure) in 5%.

The WHO has estimated the global death rate for the novel coronavirus to be 3.4%.

CLINICAL FEATURES

The most common symptoms of COVID-19 are fever, cough and expectoration. Serious cases can have severe pneumonia, acute respiratory distress syndrome (ARDS) and multiple organ failure resulting in death.[12]

Other symptoms may include headache, sore throat, rhinorrhea (runny nose) and/or gastrointestinal symptoms.[13]

Researchers from King's College London have suggested that a sudden loss of smell (hyposmia/anosmia) and taste (dysgeusia) may be an early symptom of COVID-19. The American Academy of Otolaryngology - Head & Neck Surgery (AAO-HNS) has proposed adding anosmia and dysgeusia to the list of screening items for potential novel coronavirus disease (COVID-19). *"Anosmia, hyposmia and dysgeusia in the absence of other respiratory disease such as allergic rhinitis, acute rhinosinusitis or chronic rhinosinusitis should alert physicians to the possibility of COVID-19 infection and warrant serious consideration for self-isolation and testing of these individuals".*[14]

Case Definition

The criteria for suspect case, probable case and confirmed case have been defined by the WHO.

Suspect case

- A patient with acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath), AND a history of travel to or residence in a location reporting community transmission of COVID-19 disease during the 14 days prior to symptom onset; or
- A patient with any acute respiratory illness AND having been in contact with a confirmed or probable COVID-19 case (see definition of contact) in the last 14 days prior to symptom onset; or
- A patient with severe acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath; AND requiring hospitalization) AND in the absence of an alternative diagnosis that fully explains the clinical presentation.

Probable case

- A suspect case with inconclusive testing for COVID-19, or
- A suspect case for whom testing could not be performed for any reason.

Confirmed case

A person with laboratory confirmation of COVID-19 infection, regardless of clinical signs and symptoms.

Global surveillance for COVID-19 caused by human infection with COVID-19 virus: Interim guidance, WHO, 20 March 2020.

LABORATORY DIAGNOSIS

White Blood Cell Count

Patients with COVID-19 may have lymphocytopenia (83.2%) and leukopenia (33.7%).[15] Compared to nonsurvivors, survivors had significantly higher baseline lymphocyte count; in survivors, lymphocyte count was lowest on Day 7 after onset of illness and improved during hospitalization, while severe lymphopenia was observed until death in nonsurvivors.[16]

Platelet Count

Thrombocytopenia has been observed in 36.2% cases with COVID-19.[15]

Serum Procalcitonin

In uncomplicated infection, serum procalcitonin level is normal. High procalcitonin levels are indicative of bacterial coinfection (sepsis).[17]

C-reactive Protein

C-reactive protein (CRP) levels are raised in most patients.[15]

Laboratory Abnormalities Indicative of Poor Prognosis[17]

Increased white blood cell count	Increased total bilirubin
Increased neutrophil count	Increased creatinine
Decreased lymphocyte count	Increased cardiac troponin
Decreased albumin	Increased D-dimer
Increased lactate dehydrogenase (LDH)	Increased prothrombin time (PT)
Increased alanine aminotransferase (ALT)	Increased procalcitonin
Increased aspartate aminotransferase (AST)	Increased CRP

All suspect cases (as per the criteria above) should be tested for SARS-CoV-2 in throat and nasal swabs (preferred sample) or nasopharyngeal swab, bronchoalveolar lavage or endotracheal aspirate (alternate samples).[18] The induction of sputum is not recommended.[19] Sampling should be done under strict airborne infection control precautions.

Patients should also be tested for other pathogens as per guidelines for the management of community-acquired pneumonia.[20]

ICMR Current Testing Strategy

- All asymptomatic individuals who have undertaken international travel in the last 14 days:
  - They should stay in home quarantine for 14 days
  - They should be tested only if they become symptomatic (fever, cough, difficulty in breathing)
  - All family members living with a confirmed case should be home quarantined.
- All symptomatic contacts of laboratory confirmed cases.
- All symptomatic healthcare workers.
- All hospitalized patients with severe acute respiratory illness (fever AND cough and/or shortness of breath).
- Asymptomatic direct and high-risk contacts of a confirmed case (those who live in the same household with a confirmed case and healthcare workers who examined a confirmed case without adequate protection) should be tested once between Day 5 and Day 14 of coming in his/her contact.

Indian Council of Medical Research, Dept. of Health Research, Revised Strategy of COVID19 testing in India (Version 3, dated 20/03/2020).

The diagnosis of COVID-19 is confirmed by the detection of virus RNA by reverse-transcription polymerase chain reaction (RT-PCR). However, a negative test does not rule out the possibility of COVID-19.

A false-negative test may be due to poor quality of specimen, or specimen collected late or very early in the course of the disease or the specimen was not handled and shipped appropriately or technical reasons.[20]

Imaging

Chest X-ray: Chest X-ray in a patient with COVID-19 shows bilateral peripheral consolidation. Baseline chest X-ray had a sensitivity of 69%, compared to 91% for initial RT-PCR.[21]

Chest CT scan: The major findings on CT include bilateral ground glass opacity, consolidation or both.[22]

The RT-PCR test has high specificity but low sensitivity (60-70%). Hence, patients may have pneumonia even with an initial negative RT-PCR. CT therefore could be an important modality to detect COVID-19 pneumonia in such patients.[23]

MANAGEMENT

Patients with mild disease or their close contacts can be managed by isolation at home or isolation facility. Patients with severe disease need hospitalization.

There is no specific antiviral treatment recommended for COVID-19.

The "Solidarity trial", to be conducted by the WHO, will compare the safety and effectiveness of four different drugs or drug combinations against COVID-19: Remdesivir; chloroquine, hydroxychloroquine; combination of lopinavir and ritonavir; combination of lopinavir, ritonavir and interferon-beta.

Various drugs used for treatment of COVID-19 are remdesivir (experimental antiviral drug - compassionate use only),[24] combination of lopinavir and ritonavir,[25] hydroxychloroquine and chloroquine.[26,27]

The Central Drugs Standard Control Organization (CDSCO) has approved the "restricted use" of lopinavir-ritonavir combination for treating those affected by novel coronavirus.

The National Task Force for COVID-19 set up by ICMR has recommended hydroxychloroquine for prophylaxis of SARS-CoV-2 infection for high-risk population.

- Asymptomatic healthcare workers involved in the care of suspected or confirmed cases of COVID-19: 400 mg twice a day on Day 1, followed by 400 mg once weekly for next 7 weeks; to be taken with meals.
- Asymptomatic household contacts of laboratory confirmed cases: 400 mg twice a day on Day 1, followed by 400 mg once weekly for next 3 weeks; to be taken with meals.

Systemic corticosteroids are to be used only if there is another indication such as exacerbation of asthma or chronic obstructive pulmonary disease (COPD), septic shock.[28]

When to Discharge the Patient?

If the person tests positive for COVID-19, the case shall be managed as per the confirmed case management protocol. The treated patient should be discharged only after evidence of chest CT clearance and two samples test negative for the virus within a period of 24 hours.[29]

Some patients with mild COVID-19 may continue to be infectious even when symptoms have resolved. In a study from China, about 50% of patients who had recovered from mild disease continued to shed the virus for up to 8 days despite two consecutive negative RT-PCR tests. This may hamper efforts to control the spread of the infection.[30] Therefore, the recently recovered patients or asymptomatic persons should be treated as carefully as symptomatic patients.

ROLE OF THE GP IN MANAGEMENT OF COVID-19

General practitioners (GPs) are the backbone of medical practice as they are the first point of contact for the patient. Hence, in the current scenario of the national lockdown due to the COVID-19 pandemic, GPs have an important role to play. The first and foremost is timely consultation. This facilitates prompt case detection and its management and thus prevents further spread of infection.

GPs should provide as many teleconsultations as possible at least for the duration of the lockdown. These consultations can be paid similar to the regular in-person consultations. Inform all your patients by SMS or email that no office consultation would be provided. Teleconsultation helps to prevent cross infection of coronavirus-like illnesses among the large number of patients waiting to see the doctor. It also keeps the doctor and the staff safe.

The government has released new telemedicine practice guidelines. Patient consent is necessary for any telemedicine consultation. Four types of telemedicine consults have been identified according to:

- Mode of communication (video, audio, text-based)
- Timing of the information transmitted (real time or asynchronous - accessed as per need or convenience)
- Purpose of the consultation (non-emergency or emergency)
- Interaction between the individuals involved (Registered medical practitioner [RMP]-to-patient/caregiver, or RMP to RMP).

Take a complete medical history including travel history to a country with active COVID-19 transmission or history of close contact with a positive case.

If the person is a suspect case (*as per criteria defined earlier*), prescribe blood tests (complete blood count [CBC], CRP) including test for COVID-19. Check the ICMR list of approved government or private laboratories nearby, which are equipped to test for COVID-19. Or, advise the patient to contact the central or state helpline number for testing.

If there is a positive history of travel to COVID-19 affected countries or if the patient falls under the case definition of COVID-19 (suspect/case), get the self-declaration form (from Health Ministry) filled.

All suspect cases should be informed to the appropriate authority. As per directive from the Health Ministry, Government of India, *"it is obligatory for all hospitals (Government and Private), Medical officers in Government health institutions and registered Private Medical Practitioners including AYUSH Practitioners, to now notify COVID-19 affected person (as defined by MoHFW) to concerned district surveillance unit".*

Assess the patient to categorize the severity of illness: Mild, moderate or severe.

If the person has history of travel in the last 14 days and has symptoms, advise isolation at home or in an isolation facility. For close contacts, advise home quarantine for 14 days. Any person in quarantine who develops symptoms (cough/fever/difficulty in breathing) at any point during the quarantine period should be advised to inform or visit the nearest health center or call the helpline number. Educate them about cough hygiene, hand hygiene, proper use of masks and maintaining distance from others in the family.

It is easy to identify patients who will need hospitalization as they will be breathless. Refer such patients to nodal hospitals.

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Lactic Acid Bacteria Isolated from a Korean Food Item Activate Vitamin D Receptor-autophagy Signaling Pathways

According to a study published in the *Inflammatory Bowel Diseases* journal, probiotic lactic acid bacteria (LAB) exert anti-inflammatory action and induce autophagy. These effects have been reported to depend on the expression of vitamin D receptor.

In this study, 5 LAB strains were isolated from Korean kimchi. The findings demonstrated benefits of these strains isolated from food in anti-infection and anti-inflammation.

Magnetic Field Exposure *in utero* may Increase Kids' Risk of ADHD

Babies exposed to relatively strong household magnetic fields (MF*) in utero* appeared to have higher odds of developing attention-deficit/hyperactivity disorder (ADHD), reported a longitudinal birth cohort study published in *JAMA Network Open*.

Children whose mothers were exposed during pregnancy to fields of over 1.3 milligauss (mG) during normal activities were more than twofold as likely to develop ADHD as those exposed to lower levels (adjusted HR 2.01, 95% CI 1.06-3.81), reported researchers.

Asthma, Type 1 Diabetes Often Co-occur in Children, Families

Asthma and type 1 diabetes often co-occur in children and their family members, suggests new research.

Siblings with either condition had an increased risk of the other compared with the general population. While individuals diagnosed with asthma first, at an average age of 3 years, had an increased risk for a subsequent diagnosis of type 1 diabetes (at an average age of 5.9 years), the reverse wasn't seen. The findings were published online in *JAMA Network Open*.