

SELF-DIAGNOSIS FOR COVID-19

Possibilities and Limitations

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The primary causative agent of the coronavirus disease 2019 (COVID-19) is SARS-CoV-2, which belongs to the class of β -coronaviruses. The virus mainly infects the lower respiratory tract and can cause pneumonia. The median incubation period of the virus is 4-5 days before the onset of symptoms. These symptoms develop on an average of 11.5 days. The virus reaches its peak after 5-6 days of symptom onset and the acute symptoms make an appearance after 8-9 days of onset. Thus, there is an ample amount of time between the first contact of the virus and the onset of the disease condition. This time can be utilized to observe precautionary measures of self-isolation and cure.

The pathophysiology of the SARS-CoV-2 indicates the chain of events of viral infection and its associated symptoms. Transmission of the SARS-CoV-2 mainly occurs via respiratory droplets, with a possible, but unproven, fecal-oral transmission route. Like most other viral infections, the SARS-CoV-2 comes in contact with the host (human) immune system, where it evades innate immunity and encounters the adaptive immune response (*Frieman et al, 2008*). This results in a possible cold response, which is often

associated with the **loss of smell and taste**. The pathophysiology is characterized by aggressive inflammatory responses strongly implicated in the resulting damage to the airways. When the virus reaches the lower respiratory tract the host (human) immune cells show a rapid inflammatory response by the release of a chemical called cytokine. These cytokines accumulate in the lungs and invite immune response cells called macrophages and T-cells to the affected site (*Tay et al, 2020*). The immune response cells and cytokines together cause mucus secretions and inflammation to occur at the affected site, in this case, the lungs. Thus the primary encounter of the immune cells with the virus causes **fever** and the mucus secretions in the lungs cause the symptoms of **cough** to occur. The lack of oxygen and the spread of inflammation may also cause myalgia (inflammation in muscle) in some patients leading to **muscle pain and joint pain**.

The aggressiveness of the inflammatory response leads to a disease condition called the Acute Respiratory Distress Syndrome (ARDS) which causes **difficulty in breathing** and low blood oxygen levels. ARDS is a life-threatening complication that is prone to **older adults** (of higher age groups) and persons with **immune disorders** or persons

with an earlier **history of diseases** such as hypertension, diabetes, etc. (*Tay et al, 2020*).

Sometimes the immune system response to viral infections is so aggressive that it causes a cytokine storm in the body and leads to a condition called sepsis. In these cases, uncontrolled inflammation of not only lungs occurs but the inflammation spreads to other organs such as heart, liver, and kidney leading to multiple organ failure and ultimately death.

Some studies have also shown the likeness of the SARS-CoV-2 to the gastrointestinal tract, i.e. the virus can reside and multiply in the gastrointestinal tract. Other studies report that the digestive system is the potential route of the viral infection (*Zhang et al, 2020*). This was confirmed by the presence of the viral RNA in the stool samples of the infected patients. Thus, some patients also show symptoms related to improper digestion such as **diarrhea, vomiting, etc** (*Wong et al, 2020*).

Therefore, based on the pathophysiology of the virus explained above, a primary level of self-diagnosis can be done by people to evaluate their potential infection to the disease. The symptoms that need to be checked are;

1. Fever
2. Cough
3. loss of smell/taste
4. muscle pain/joint pain
5. difficulty in breathing
6. whether belong to older age group
7. whether having any previous disease condition
8. diarrhea and nausea

Limitations

While self-diagnosis can be a great help in the assessment of the disease risk, it is associated with a few limitations as well. A major limitation is that self-report nature is biased towards the intentions of the person performing self-diagnosis, i.e. a person's answers would be biased towards the final assessment he/she wants to have. The widespread information about the disease symptoms through the media might provoke

the individual to mark him/her as disease-free by answering negatively. This might lead to an increase in false negatives.

Another limitation of the self-diagnosis is that the assessment done by an individual himself/herself cannot replace physiological assessments of an experienced physician, sometimes leading to misunderstood questions and wrong answers. Thirdly, questions about the gustatory (related to taste) and olfactory (related to smell) symptoms are conflated and can arise due to several other reasons. An example would be a case of anosmia (partial/complete loss of smell), which might occur as a result of a common cold or may have been acquired due to other factors.

However, in spite of these limitations, self-diagnosis can help in increasing the number of laboratory assessments of the probable COVID-19 patients, allowing the sophistication of modern medicine to cure the patient before the disease progresses any further.

References

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