

Precision Medicine and COVID-19



Precision medicine has been an important goal in healthcare. Researchers have been focused on generating new disease subclassifications to maximise individualised treatment options. There have been many phenotypes, endotypes, and subtypes so that patients who demonstrate specific symptoms and fall into a specific subtype or phenotype can be treated with precision.

The same is true for SARS-CoV-2. To date, more than 60 subtypes have been proposed ranging from simple classification such as the H or L phenotype of COVID-19 related ARDS to groups organised by machine learning methods.

The point of the effort is this: not all SARS-CoV-2 infections are the same. COVID-19 is a complex disease. It is not caused by a single, genetically identical RNA virus. It is an evolving pathogen with mutations and variants. Each variant has a different effect on transmission, antigenicity, and virulence.

Since SARS-CoV-2 is not always the same, some patients have more disease severity and an increased risk of death compared to others. Also, it is important to understand that even the hosts are not the same. They differ in age, gender, and respiratory comorbidity. They have different baseline factors. All these have an impact on the risk, type, and outcome of the infection. Different patients also have different levels of tolerance. This may contribute to the disparate manifestations of COVID-19 among patients who seemingly appear to be quite similar.

Patient responses to SARS-CoV-2 are also not the same. That is why the initial condition of each patient differs from another. It could be due to different preexisting conditions, a different strain, different timing of treatment etc.

Considering that the COVID-19 infection presents differently in each patient depending on the variant, subtype, and host factors, isn't it important to identify meaningful COVID-19 subtypes? So far, the subtyping has been more or less imprecise. In some patients, glucocorticoids and IL-6 receptor antagonists appear beneficial along with oxygen support, but on the other hand, anticoagulation appears to be the better option in patients with milder symptoms.

During the time of the pandemic, it is too difficult to conduct a sophisticated biomarker-guided precision trial. But at the same time, it is evident that the pursuit of precision COVID-19 treatment is unavoidable. Five criteria could help define COVID-19 subtypes. These include:

- Biologically plausible because a biological mechanism must underlie any proposed subtypes.
- Promptly identifiable through practical steps or measurement techniques.
- Nonsynonymous to ensure that subtype proposals do not identify the same patients.
- Reproducible to ensure subtypes can be reproduced in similar patients from separate data sets.
- Treatment responsive by ensuring subtype-specific treatment strategies are identified.

There is still a long way to go when it comes to achieving a precise approach to COVID-19. But this goal should be considered important, and the path to an effective precision medicine approach for COVID-19 must be realised sooner than later.

Source: [JAMA](#)

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