



## Editorial

# Biomarkers in Covid-19 Diagnosis

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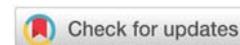
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In medicine, a biomarker is a measurable indicator of the severity or presence of some disease state. Universally a biomarker is anything that can be used as an indicator of a particular disease state or some other physiological state of an organism.

Biomarkers have always played a key role in clinical decision making in numerous infectious diseases. It is critical to estimate the role of biomarkers in evaluating severity of disease and appropriate allocation of resources.

Biomarkers can be classified into different categories depending on their functions, characteristics such as imaging biomarkers that includes computed tomography, positron emission tomography, and magnetic resonance. Other class is namely molecular biomarkers. The molecular biomarkers can be referred to as nonimaging biomarkers which have biophysical properties permit them to be measured as biological samples, and also includes nucleic acid-based biomarkers such as gene mutations or as polymorphs, and quantitative gene expression analysis, peptides, proteins, lipid metabolite, and different other small molecules. Biomarkers can also be categorized depending on their application, such as diagnostic biomarkers, disease prognosis biomarkers (cancer biomarkers), staging of disease biomarkers, and biomarkers which are used for monitoring the clinical response to an intervention. Another class of biomarkers include those that are used in decision making in early drug development. For instance, specific pharmacological response can be marked by pharmacodynamic biomarkers and exceptionally used in dose optimization studies [1].

As of 11<sup>th</sup> March 2020, due to the outbreak of Corona Virus, it was declared a global pandemic by WHO, and as of April 2020, the COVID-19 pandemic has infiltrated over 200 countries and has affected over three million confirmed people. Over the

course, different biomarkers were evaluated to analyse and confirm their clinical outcome and correlation with the severity of COVID-19 disease.

Biomarkers were heavily used by researchers worldwide as diagnostic tools in COVID-19 trials. According to GlobalData, a leading data and analytics company, biomarkers have been a beneficial too in the search and development of COVID-19 vaccine that will help in speeding up the clinical trials and also reduced cost developments. They also help in guiding the subject selection, reducing patient safety risks and allow for easier verification of the mechanism of action. According to the biomarkers database of GlobalData, the top two of the biomarkers being in use for COVID-19 trials are diagnostic markers. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is the first biomarker which is now presently used in round about 30% of the COVID-19 trials. And the second biomarker being used is Coronavirus Nucleic Acid, which is being incorporated in roughly 5% of the trials. Other biomarkers such as C-reactive protein, lymphocytes, and SARS-CoV-2 RNA have also reported to be used in COVID-19 trails.

Analysts at GlobalData have commented that-Biomarkers are helpful in quick runs to identify severe cases of COVID-19. An analysis study on 28 samples of COVID-19 done from Zunyi District in China reported that serum urea, Cystatin C (CysC), and Creatinine (CREA) concentration levels in severe cases of COVID-19 patients were notably higher than those with mild COVID-19 patient cases, which suggested that biomarkers can play a prominent key role in the early diagnosis of COVID-19.

Biomarkers are also useful in determining the type of drugs that can be administered to treat COVID-19 patients. Some patients with COVID-19 also suffer from severe pneumonia.

According to the research done by GlobalData, results have shown that IL-6 that acts as a biomarker for increased immune



response and inflammation, is more evident in patients who were suffering from pneumonia. All but two of the highlighted clinical trials done by the GlobalData Clinical Trials Database have shown results used biomarkers. And all of the trials which have achieved their endpoints used biomarkers. With the increase of COVID-19 global threat and the consecutive trials performed, it is a given that these trials will include biomarkers to help in trial advancement, assisting in patient diagnosis and selection of drug administration [2].

Other research studies that were conducted have found a noteworthy association between thrombocytopenia, lymphocytopenia, and the elevated levels of CRP, PCT, LDH, D-dimer and COVID-19 severity. The results have shown that it is inherently possible to be used as an early biomarker to improve the COVID-19 patient care, by detecting high-risk patients and providing fitting healthcare resources during the pandemic [3].

## Conclusion

Biomarkers are playing a pivotal role both in guiding

improvements in the clinical management of COVID-19 patients and in world-wide vaccine development efforts.

Pharmacodynamic biomarkers are a class of biomarkers that are not directly involved in the patient care. However, they are employed as probing endpoints to manifest clearly that a vaccine induced is showing desired antigen-specific immune responses after dosing in the context of clinical trials. Relevant results can be produced even where shipping to geographically distant, specialized immunology labs is required, as long as logistics considerations are addressed during the validation phase.

## References

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