

“Cytokine Storm” & COVID-19

SARS-CoV-2



TNF, IFN- α / β , IL-6, IL-1 β

ARDS



Cytokine Storm

- Overwhelming inflammatory immune response to an illness or trigger with release of:
 - Interferon (IFN), interleukins (IL), tumor-necrosis factor (TNF), chemokines
- Results in cell and tissue damage



COVID-19

- Pathogenesis of lung injury & multiple organ dysfunction syndrome remain uncertain
- Cytokine storm is on proposed theory of pathogenesis in severe COVID-19 illness
 - \uparrow IL-6 has been associated with disease severity¹



Acute Respiratory Distress Syndrome (ARDS)

- IL-6 plays a key role in pathogenesis in several known viral etiologies²
 - eg, Influenza & SARS-CoV
- Mechanisms other than cytokine storm may contribute to COVID-19 ARDS
 - Median levels of IL-6 in COVID-19 ARDS are \uparrow but reported \leq than median levels seen in typical ARDS³



Therapies

- Clinical trials are evaluating IL-6 pathway targeted treatments such as:
 - Tocilizumab (IL-6 receptor inhibitor)
 - Sarilumab (IL-6 receptor antagonist)
 - Siltuximab (monoclonal antibody with high affinity for IL-6 receptor)

Further study is needed to evaluate the role of cytokine storm in the pathogenesis and severity of COVID-19 disease.

¹Qin C et al. Clin Infect Dis. 2020.

²Wang W et al. Clin Infect Dis. 2004.

³Sinha P et al. JAMA Intern Med. 2020.