

Cytokine Storm Syndrome link with COVID-19

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Have you heard of a syndrome called Cytokine Storm?

Let us find out what cytokines are. They are a group of proteins, peptides or glycoproteins secreted by specific cells of the immune system. They are chemicals that signal and regulate your immune system.

Such signaling by these chemicals stimulate the immune system to fight a foreign germ, or attack by a cancerous tumor. Now these are the good beneficial cytokines, that protect you from the invaders.

They function to protect your body cells from inflammatory diseases produced by bad damaging cytokines, and foreign invasions by pathogens.

There are the bad inflammatory cytokines produced by the same immune cells that cause havoc in your body.

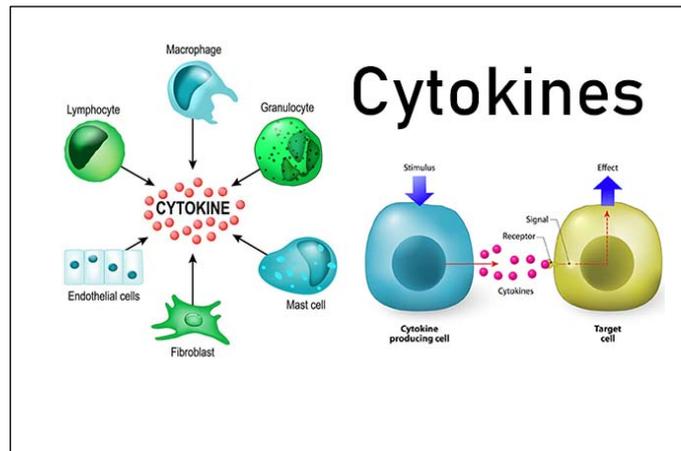
So, basically both good and the bad cytokines seems to be secreted by the immune cells.

Through taking drugs the body could modulate the cytokine expression to produce good cytokines and block the bad cytokines from damaging the body as in rheumatoid arthritis, Crohn's disease and so on.

The bad cytokines are also referred to as inflammatory cytokines.

It is known that adipose or fat tissues secretes various inflammatory cytokines and hormones

People with big bellies have very much stocked fat in their adipose tissue in the visceral organs within the belly. These adipose cells pump out immune system chemicals called cytokines which increases your risk of cardiovascular disease and many other chronic diseases. They are the bad fellows.



These chemicals have deleterious effects on cells' sensitivity to insulin, blood pressure, blood clotting, and many other metabolic processes in the body.

In the current COVID-19 endemic the more severe cases seem to be stimulated by the immune system to secrete large amounts of inflammatory cytokines, such as tumor necrosis factor (TNF), and this is described as cytokine storm.

These inflammatory cytokines increase the risk of vascular hyperpermeability, meaning leading to weakness of their walls and leakage of serum and other chemicals through the permeable walls, and disrupting the normal metabolism in your body. That is how you explain the swelling in your body, a common symptom of COVID-19 disease.

Such bad cytokine storms also affect your organs and lead to organ failure, as a new finding in COVID-19 infections.

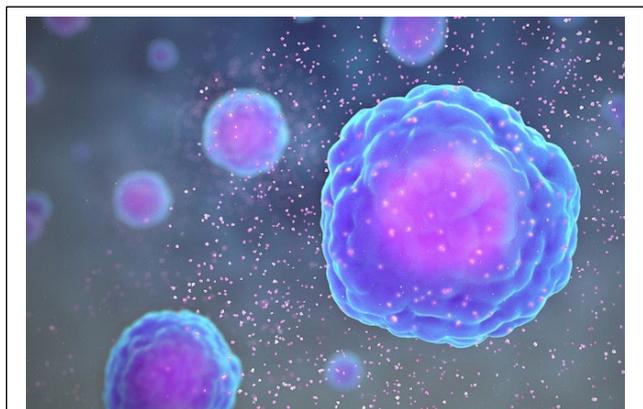
Another new finding is that cytokine storm can activate a severe systemic inflammatory response to human coronavirus family members and cause what is called a macrophage activation syndrome(MAS), also known as secondary hemophagocytes and an acute consumptive coagulopathy, leading to disseminated intravascular coagulation.

It has been found that 20% to 30% of critically ill COVID-19 patients get clots in their pulmonary blood vessels. These findings were from studies by the scientists in Netherlands and France

Laboratory data indicate early pulmonary intravascular coagulopathy and that could be the main cause of death.

Blood clotting is a normal body's mechanism to stop bleeding. Some researchers seem to believe that clotting as a key feature of COVID-19.

On basis, should the doctors give blood thinning drugs to cure the disease. It is also observed that blood thinners do not reliably prevent clotting in people



In some severe cases of COVID-19, the release of too many signalling molecules called cytokines — a cytokine storm — can cause the immune system to attack the body, with deadly results. (Credit: [scientificanimations.com/Wikimedia Commons](https://www.scientificanimations.com/WikimediaCommons))

with COVID-19, and young people are dying of strokes caused by blockage of brain vessels in the disease.

Researchers also have found, in addition to blood clots in large vessels like the pulmonary veins, miniature clots found in the body's smallest vessels.

Jeffrey Laurence, a hematologist at Weill Cornell Medicine in New York City, and his colleagues examined lung and skin samples from three people infected with COVID-19 and found that the capillaries were clogged with clots. Other groups, including a team led by O'Donnell, have reported similar findings.

This is the reason why mechanical ventilators so popularly used on these patients in the ICU's did not help and just oxygen inhalation through a tube was found to be sufficient. British Prime Minister was treated that way and he fully recovered without a ventilator use.

So, it is concluded that it is the cytokine storm that causes the death in most severe cases of COVID-19.

So, there is a mild to moderate form of the disease, and the severity is not influenced by the cytokine storm, as in the severe cases, and there is no organ damage or blood clot formations.

Umesh Gidwani, head of cardiac intensive care at New York's Mount Sinai Hospital, says that trying to treat the severe form of the disease is like facing a terrifying fire, burning out of control.

"The patients we take care of [in intensive care] are those in whom the fire has already destroyed the house. But there continues to be embers and small fires. I can't enter the house because it's too hot and things are falling on me," he says.

This article should give the reader that COVID-19 is just not one disease. It could be considered as three diseases.

Vaccine will work on all three stages or types of COVID-19. Unfortunately, the vaccine may not be ready for human use until early next year. Till then social distancing and limiting your social activities may need to continue until such time.

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