



CYTOKINE STORM BASICS

The phrase “cytokine storm” has been popping up in the news regarding COVID-19. Some people are calling it an “overblown immune system response,” while others are saying it happens due to the immune system being too “strong.” Let’s take a look at some basics regarding what a cytokine storm is.

Q: *What is the immune system?*

A: The immune system is the body’s army. It detects invaders, such as viruses and bacteria, and mounts an attack strong enough to neutralize them. When the job is done, the army rests until the next enemy comes along.

Q: *What is the difference between an autoimmune disease and a cytokine storm?*

A: Both an autoimmune disease and a cytokine storm result from a malfunctioning immune system. However, the immune system malfunctions differ between the two.

In an autoimmune disease, the immune system mistakenly identifies normal healthy body tissue as “foreign” and attacks it.

In a cytokine storm, the immune system is unable to control itself. Unlike an autoimmune disease, the immune system can still recognize what is foreign, so it does not target healthy cells to attack. But, when an enemy invades, the immune system is not able to control its response and cannot stop attacking, even after defeating the enemy. The resulting collateral damage affects the body’s own cells, tissues, and organs.

Q: *Why are some COVID-19 patients dying from cytokine storms?*

A: COVID-19 patients dying from cytokine storms have faulty immune functions. Their immune system is out of control. The issue is not their immune system being “too strong.” Rather, they have a defect in their immune system that tells it to keep attacking when it should stop. It is like having the gas pedal in a car pressed to the floor while the brakes are broken—the car keeps running and cannot stop. It is not an issue of the car’s horsepower being too high!

Q: *What are cytokines?*

A: Cytokines are small proteins that different immune cells use for communication. For example, pro-inflammatory cytokines call upon the immune army to attack, while anti-inflammatory cytokines tell the immune system that the job is done and to back off.

Q: *Are cytokines bad?*

A: Cytokines are not inherently bad. The immune system needs cytokines to work properly. When the immune system is functioning perfectly, pro-inflammatory cytokines and anti-inflammatory cytokines work together to neutralize an invader—first, by attacking it, and then, by backing off, so the immune system is not perpetually in attack mode.

Q: *What is a deadly COVID-19 cytokine storm?*

A: When a person who has a previously unknown defect in the immune system gets COVID-19, his body will not be able to control the inflammatory cytokines, which results in an amplified immune response. His body’s own cells and tissues will be damaged, because his immune system does not know when to stop attacking, and will continue to attack even when the COVID-19 virus has already been defeated.

Q: *Are autoimmune patients more likely to get cytokine storms?*

A: Yes. For example, about 10% of autoimmune patients with juvenile idiopathic arthritis (JIA) experience cytokine storms (unrelated to COVID-19). Adults with lupus or other autoimmune conditions may also develop cytokine storms.

There are many things that can trigger a cytokine storm, including noninfectious agents. Many infections, not necessarily COVID-19, can trigger a cytokine storm.

Q: *What can I do for a healthy, balanced immune system?*

A:

- Eat more fruits and vegetables, and less animal products.
- Be happy, smile more.
- Exercise daily and sleep well.