Can Stress Really Make Us Sick?

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It seems like a no-brainer that stress may make us more likely to succumb to viruses and other infections, but that's a tough connection to make scientifically.

For starters, it would not be ethical to test the idea by putting people under extreme stress and exposing them to dangerous infections in the laboratory. But some scientists have nonetheless found ways to study the problem. Their findings show that the picture is more complicated than the notion that too much stress can overwhelm the immune system.

Hormones biologically express our emotions, says Jan Kiecolt-Glaser, a psychologist at the Ohio State University College of Medicine and a pioneer in this field. Stress hormones are part of the "fight or flight" response that primes your body for battling a saber-toothed predator or avoiding a car crash.

"But if stress is chronic every day, pumping out hormones without any escaping or fighting, then it's not good for your immune system," impairing its response to infection, Kiecolt-Glaser says. And Americans' chronic stress isn't going away.

The American Psychological Association's 2013 Stress in America online survey showed that 84 percent of participants reported stress levels equal to or higher than those in the previous year. Yet only 35 percent report managing their stress well.

Research by Kiecolt-Glaser and others has shown that stress doesn't necessarily suppress the immune system, but it does hamper the body's ability to respond to infections appropriately.

Kiecolt-Glaser and her colleagues use vaccination as an ethical way to compare immune responses in people with different stress levels. Vaccines give each person the same exposure to a "foreign invader" and cause a predictable production of antibodies.

In 1998, her team showed that stressed people — students about to take a medical board exam and caregiving spouses of Alzheimer's patients — took longer to develop protective antibodies after vaccination than did other students or spouses.

Sheldon Cohen, a health psychologist at Carnegie Mellon University in Pittsburgh, wanted to know what those immune changes meant when a chronically stressed person was exposed to an actual infection. So his team measured the stress levels of healthy volunteers through questionnaires, then exposed them to nasal drops containing cold viruses. Over the next five days, they determined who had become infected and quantified their congestion and mucus production (by weighing the snot found in every used tissue).

The more stress people reported — especially from ongoing personal conflicts or unemployment — the greater their likelihood of getting sick. Cohen's group also showed that high-stress people infected with the flu virus produced more pro-inflammatory cytokines than their less-stressed peers. These cytokines are the molecular signals that recruit immune cells to the site of infection or injury and cause the cold symptoms of a runny nose and congestion.

A small cytokine response can shut down an infection without any symptoms at all. But when your body produces too many of these molecules, you have a full-blown cold and its accompanying pile of tissues. In a 2012 study, Cohen's group showed how chronic stress disables one of the body's mechanisms for the cytokine off-switch.

The bottom line, Kiecolt-Glaser says, is that "chronic stress makes it more likely you become infected and that infections will last longer and be nastier."

Other immunology experts are not so sure.

Erwin Gelfand, an immunologist at National Jewish Health in Denver, has no doubt that stress causes small changes in immune cells or inflammatory molecules, but he's skeptical that those changes are significant.

"The immune system is very plastic and flexible. On balance, I think our immune system manages these perturbations," he says. Otherwise, he reasons, most Americans would be sick in bed most of the time.

“To say stress lowers our vulnerability to disease? That’s a quantum leap at this point,” Gelfand says.

But Greg Miller, who studies how stress affects health, thinks the evidence is “as strong as it can be,” given the limitations of human laboratory studies. And it points, he says, to an evolving view of how stress impacts immunity — that perhaps stressed-out immune responses are too much of a good thing.

“Immune cells are sloppy, and they make a mess,” calling in other cells and setting off chain reactions in the process of fighting infection or healing wounds, says Miller, a psychologist at the Institute for Policy Research at Northwestern University. With stress, that mess gets bigger, more out of hand, creating collateral damage.

Scientists now think that immune overdrive, especially chronic high inflammation, explains why stress is linked to aging-related diseases such as diabetes, cardiovascular disease and cancer. “You have a lifetime of these overshot inflammatory responses and the damage they accumulate over the course of decades,” Miller says.

So is there anything I can do to keep my immune system operating smoothly?

Kiecolt-Glaser advises monitoring stress through such activities as controlled deep breathing, practicing mindfulness and talking to a therapist. In a study published last month, her team found that breast cancer survivors who did yoga twice a week for three months had lower levels of inflammatory molecules and slept better than similar women who did not.

“Channel energy into more physical activity. Make more connections with friends,” Miller suggests. “None of that is high-tech.”

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