

Yoga reduces cytokine levels known to promote inflammation

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(PhysOrg.com) -- Regularly practicing yoga exercises may lower a number of compounds in the blood and reduce the level of inflammation that normally rises because of both normal aging and stress, a new study has shown.

The study, done by Ohio State University researchers and just reported in the journal [Psychosomatic Medicine](#), showed that women who routinely practiced yoga had lower amounts of the cytokine [interleukin-6](#) (IL-6) in their blood.

The women also showed smaller increases in IL-6 after stressful experiences than did women who were the same age and weight but who were not yoga practitioners.

IL-6 is an important part of the body's [inflammatory response](#) and has been implicated in heart disease, stroke, [type-2 diabetes](#), arthritis and a host of other age-related debilitating diseases. Reducing inflammation may provide substantial short- and long-term health benefits, the researchers suggest.

"In addition to having lower levels of inflammation before they were stressed, we also saw lower inflammatory responses to stress among the expert yoga practitioners in the study," explained Janice Kiecolt-Glaser, professor of psychiatry and psychology and lead author of the study.

"Hopefully, this means that people can eventually learn to respond less

strongly to stressors in their everyday lives by using yoga and other stress-reducing modalities."

For the study, the researchers assembled a group of 50 women, age 41 on average. They were divided into two groups - "novices," who had either taken yoga classes or who practiced at home with yoga videos for no more than 6 to 12 sessions, and "experts," who had practiced yoga one of two times weekly for at least two years and at least twice weekly for the last year.

Each of the women was asked to attend three sessions in the university's Clinical Research Center at two-week intervals. Each session began with participants filling out questionnaires and completing several psychological tests to gauge mood and anxiety levels.

Each woman also was fitted with a catheter in one arm through which blood samples could be taken several times during the research tasks for later evaluation.

Participants then performed several tasks during each visit designed to increase their stress levels including immersing their foot into extremely cold water for a minute, after which they were asked to solve a series of successively more difficult mathematics problems without paper or pencil.

Following these "stressors," participants would either participate in a yoga session, walk on treadmill set at a slow pace (.5 miles per hour) designed to mirror the metabolic demands of the yoga session or watch neutral, rather boring videos. The treadmill and video tasks were designed as contrast conditions to the yoga session.

Once the blood samples were analyzed after the study, researchers saw that the women labeled as "novices" had levels of the pro-inflammatory

cytokine IL-6 that were 41 percent higher than those in the study's "experts."

"In essence, the experts walked into the study with lower levels of inflammation than the novices, and the experts were also better able to limit their stress responses than were the novices," Kiecolt-Glaser explained.

The researchers did not find the differences they had expected between the novices and experts in their physiological responses to the yoga session.

Co-author Lisa Christian, an assistant professor of psychology, psychiatry and obstetrics and gynecology, suggested one possible reason:

"The yoga poses we used were chosen from those thought to be restorative or relaxing. We had to limit the movements to those novices could perform as well as experts.

"Part of the problem with sorting out exactly what makes yoga effective in reducing stress is that if you try to break it down into its components, like the movements or the breathing, it's hard to say what particular thing is causing the effect," said Christian, herself a yoga instructor. "That research simply hasn't been done yet."

Ron Glaser, a co-author and a professor of molecular virology, immunology and medical genetics, said that the study has some fairly clear implications for health.

"We know that inflammation plays a major role in many diseases. Yoga appears to be a simple and enjoyable way to add an intervention that might reduce risks for developing heart disease, diabetes and other age-related diseases" he said.

"This is an easy thing people can do to help reduce their risks of illness."

Bill Malarkey, an professor of internal medicine and co-author on the study, pointed to the inflexibility that routinely comes with aging.

"Muscles shorten and tighten over time, mainly because of inactivity," he said. "The stretching and exercise that comes with yoga actually increases a person's flexibility and that, in turn, allows relaxation which can lower stress."

Malarkey sees the people's adoption of yoga or other regular exercise as one of the key solutions to our current health care crisis. "People need to be educated about this. They need to be taking responsibility for their health and how they live. Doing yoga and similar activities can make a difference."

As a clinician, he says, "Much of my time is being spent simply trying to get people to slow down."

The researchers' next step is a clinical trial to see if [yoga](#) can improve the health and reduce inflammation that has been linked to debilitating fatigue among breast cancer survivors. They're seeking 200 women to volunteer for the study that's funded by the National Cancer Institute.

More information: www.psychosomaticmedicine.org/

Provided by Ohio State University

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