

Get Healthy

WELLNESS

Exercise and the Immune Response

By Erik Durak



One of the most important areas of sports medicine research in the late 1980's was the application of immune system markers to exercise and conditioning programs. This has been seen as a "validation" of sorts as to the efficacy of exercise programs to a biological response from the body. This article will concentrate on the effects of exercise on immune function, and lets you decide as to how exercise can play a role in helping the body fight disease and improve general health.

What is the immune system?

The immune system is the body's defense center. Specific cells react to specific invaders, and if all is working properly, destroy these invaders to keep the body functioning properly. Some of the specific immune cells include the following:

- ✧ Natural Killer (NK) cells, situated in the bone marrow, which kills foreign cells
- ✧ Phagocyte cells, situated in the blood stream, which kills bacteria
- ✧ T-cells, situated in thymus gland, which has cellular immunity functioning
- ✧ B-cells, situated in bursa cells, which has hormonal immunity functioning

Immune cells produce anti-bodies, and generally help both hormone and other cellular functions to occur in their normal progression. It is when a foreign invader (bacteria, virus, retrovirus, etc) known as an antigen is present in large amounts, or other situation occurs (low level of immune cells present) when problems start to arise.

What keeps the immune system going?

Good nutrition, proper sleep, and adequate hydration helps keep processes working correctly. Since some cells are formed in the bone marrow, proper amounts of zinc, selenium, and iron are required for proper development. Deficiencies in nutrition may have effects on atrophying of specific immune glands (thymus gland, spleen), and delay both the time in killing foreign invaders, and the amount of antibodies sent to do the job.

Therefore, good nutrition is essential in keeping a healthy immune system. It has stated that as much as 60% of Americans have immune system deficiencies. This underscores the proper role of good nutrition on a daily basis for maintaining and strengthening the immune system - especially during exercise.

Exercise and Immune Function

Studies in the mid 1980s from Dr. David Nieman from Appalachian State University on runners and general exercise patients gave a great deal of information on the importance of exercise in modulating the immune process. It seemed that after bouts of exercise, levels of immune system markers such as natural killer (NK) cells increased significantly.

Over time these improvements in the immune system may have an effect on overall health. It has been stated by leading oncologist Dr. John Reike from VMMC in Seattle as "immuno-enhancement", or the stimulation of the immune system above normal levels chronically.

What is the effect of this enhancement? Production of more NK cells may play two important roles:

1. Prevention. If more immune fighting power is available to healthy cells, the formation of an oncogene (initial formation of a tumor), may be destroyed before it has the chance to grow and metastasize.
2. If a cancer patient stimulates the immune system during and after chemotherapy - they may have a better chance of remaining in remission longer.

Both of these scenarios are important for improving overall health status.

The same holds true for other auto-immune diseases, such as HIV/AIDS, and Lupus, where the immune function is blunted by a viral disease. Exercise has been shown to improve immune components in these areas as well, and therefore improve overall survival and quality of life issues.

Exercise has additional benefits that may not be attributable to immune disease. We should remember that immune disorders are ultimately wasting diseases. The end stages of cancer and AIDS are tissues feeding upon themselves. It is not uncommon to see cancer patients lose over 50 lbs (\pm 25kgs) of body weight in a very short time before death.

Physical training (especially weight training) helps to maintain muscle mass and improve immune system markers, so [hopefully] the end stage of disease can be avoided. We have seen this in AIDS patients who lift weights, take supplements, and are on proper medications. This combination may see an important advancement of not just life expectancy, but as Dr. James Fries from Stanford University states: A compression of morbidity - or decrease in the problems associated with keeping patients merely alive, but not enhancing quality of life.

Exercise may be one important physiological link between an external stimulus (pushing weights, running, swimming), and changes in specific cells in the body. As mentioned, this is good news for the sports medicine community, who wish to prove to

medical personnel that exercise does more than just make you feel good - it actually changes cells in the body which may affect the course of disease.

Future issues in immune function

It is the hope of many clinicians that regular immune function reports will be as common as home cholesterol and blood sugar testing is today. This important blood marker may indeed help to direct training efforts as it does chemotherapy regimes today. The stronger the immune marker (usually white blood cells), the more therapy can be tolerated. Strong immune systems also effect our sleep patterns, our general fatigue states, and our thought processes. Although many trainers may not have access to blood data on immune markers, their knowledge of general immune function and the effects of exercise is important to discuss with patients and doctors who may see a change in immune levels after an exercise program has been implemented.

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