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Exercise and immune system

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Abstract

The human body is surrounded by pathogens that like to invade the human body and cause diseases. Pathogens are micro organisms that has the ability to cause diseases. But our body has got a self defense mechanism called the immune system to attack against these pathogens. While a strong immune system protects your body from disease, your risk for illness elevates significantly when your immune system is compromised by stress or other factors. Regular exercise throughout the week strengthens your immune system and gives you a better chance to avoid the cold or flu as well as other serious health conditions like obesity, cancer, diabetes etc.

The immune system acts as a first line defender against harmful chemicals, bacteria or viruses that weaken your body and make you more susceptible to sickness. Your immune system also works around the clock to hinder the development of life-threatening disease like cancer. Although your immune system functions effectively on its own when healthy, making changes to your lifestyle can enhance a weakened immune system and empower your body. Doctors typically recommend adding fruits, leafy green vegetables and fiber to your diet, but regular exercise is also essential

Proper nutrition helps you avoid illness, although the Cleveland Clinic reports that exercise is more important to the health of your immune system than the foods you consume. Jogging, swimming and walking or aerobic activities are commonly regarded as the most beneficial type of exercise for your immune system, regardless of your age. Aerobic workouts, which require continuous movement of your arms and legs, make you breathe deeper and faster. While aerobic exercise often receives media attention as a way to protect your heart, the activity also strengthens your immune system and significantly decreases your likelihood for viral illnesses like the flu. People who perform regular aerobic exercise also enjoy a reduced risk of diabetes, cancer, stroke and cardiovascular disease. They also typically live longer than people who don't exercise.

While aerobic exercise like soccer or bicycling lowers your risk for illness, the physical activity also decreases your stress an enemy of a healthy immune system. Aerobic workouts help reduce stress, anger and depression by allowing your body to release healthy chemicals called endorphins that aid relaxation. Some doctors characterize endorphins as natural painkillers. Reducing stress benefits more than your immune system, as people with altered mood states are also more likely to suffer fatigue and sleeping problems.

Consider doing at least 20 to 30 minutes of aerobic exercise like brisk walking up to five days a week as an effective method to protect the health of your immune system. . Higher levels of aerobic activity typically provide a better chance for significant weight loss and increased energy. Start your aerobic regimen slowly and add to the pace only when your body feels ready. Moderate exercises is really good for your immune system and also to other parts of the body. The goal is to aim for 30 to 40 minutes of the above type of activities, at least five days a week for a better tomorrow

Keywords: Physical education, fitness, wellness, sports, health

Introduction

The human body is surrounded by pathogens that like to invade the human body and cause diseases. Pathogens are micro organisms that has the ability to cause diseases. But our body has got a self defense mechanism called the immune system to attack against these pathogens. While a strong immune system protects your body from disease, your risk for illness elevates significantly when your immune system is compromised by stress or other factors. Regular exercise throughout the week strengthens your immune system and gives you a better chance to avoid the cold or flu as well as other serious health conditions like obesity, cancer, diabetes etc. The immune system acts as a first line defender against harmful chemicals, bacteria or viruses that weaken your body and make you more susceptible to sickness. Your immune system also

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works around the clock to hinder the development of life-threatening disease like cancer. Although your immune system functions effectively on its own when healthy, making changes to your lifestyle can enhance a weakened immune system and empower your body. Doctors typically recommend adding fruits, leafy green vegetables and fiber to your diet, but regular exercise is also essential

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Consider doing at least 20 to 30 minutes of aerobic exercise like brisk walking up to five days a week as an effective method to protect the health of your immune system. Your doctor may recommend extending your workouts to 60 minutes, based on a review of your health and your fitness goals. Higher levels of aerobic activity typically provide a better chance for significant weight loss and increased energy. Start your aerobic regimen slowly and add to the pace only when your body feels ready.

Basic concepts of immunity

White blood cells or leukocytes are the cells in the immune system that helps the body fight infection

The immune system response to antigenic challenge can be categorized into 2 1) Innate immunity 2) Adaptive immunity

- 1) Innate or natural immunity
- 2) Acquired immunity

Innate immune system

It provides the first line of defense against infectious agents. It is non specific means the response is the same for different bacteria, virus and other microbes. The skin, mucous membranes, phagocytes, NK cells, cytokines and complement factors.

Adaptive or acquired immunity

Second line of defense
Protects the body against specific infectious agents during both initial and subsequent attacks.
T – lymphocytes (Thymus origin)
B- lymphocytes (bone marrow origin) are associated with it.

The body's immune system can be impaired by

Temperature, wind, sun, humidity and trauma.
So it has to be rejuvenated.

How immunity can be improved?

Regular exercise is the best way to improve your immune system

- Although proper nutrition avoids illness to a certain extent
- Reports suggests that Regular exercise is important to the immune system that the food you eat.
- Jogging
- Swimming,
- Walking or aerobic activities
- Biking
- Dancing
- Treadmill running
- Aerobics reduces stress thereby reducing the stress hormones release.
- At least 20 to 30 minutes of aerobic exercise like brisk walking up to five days a week as an effective method to protect the health of your immune system.

Benefits of Exercise-How exercise helps to improve the immune system

- During moderate exercise immune cells circulate through the body more quickly and are better able to kill bacteria and viruses.
- According to professor David Nieman, Dr. PH., of Appalachian State University, when moderate exercise is repeated on a near-daily basis there is a cumulative effect that leads to a long-term immune response.
- His research showed that those who walk at 70-75 percent of their VO2Max for 40 minutes per day had half as many sick days due to colds or sore throats as those who don't exercise.
- Regular exercise may also help to increase the activity of macrophages, or the cells that attack bacteria, claims the American Council on Exercise

Moderate Exercise increases the production of:

- **Interleukin-1:** Stimulates lymphocyte activity and causes fever when you are sick by affecting areas in the brain that controls the body temperature Lymphocytes are type of WBC that fight infection
- **Interferon:** Prevent infections by activating immune cells.
- **Natural killer:** Or NK, cells are highly active immune cells. Your immune system uses NK cells to fight viral infections and cancer cells. Athletic exercise such as rowing, running and cycling may boost NK cell activity in your body for most of the day.
- Exercise reduce the chance of cancer by the loss of carcinogens through increased urine and sweat.

Stress: An enemy of healthy immune system

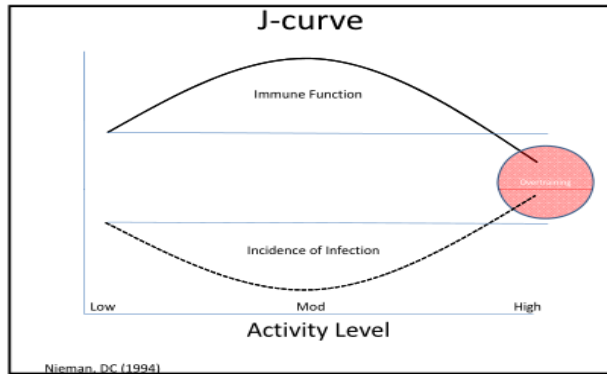
- Aerobic exercise like soccer, bicycling and any such physical activity lowers the risk of illness.
- This exercises induce the release of healthy chemicals called endorphins that aid relaxation.

They are natural pain killers.

Exercise improves immune system But what happens when we over-do it?

Studies have proved that heavy prolonged exercise sessions which extend to 90 mins can lead to a decrease in the effectiveness of your immune system, both during exercise and for 6to 9 hours after exercise stops.

This can leave your body susceptible to illness if exposed to bacteria or viruses during and after training. And may cause Upper Respiratory Tract Infections



During heavy exercise

- The athlete switches from *nasal to mouth breathing*,
- This can increase deposition of harmful particles in the lower respiratory tract.
- Increases *cooling and drying of the respiratory mucosa*, which slows ciliary movement and increases mucous viscosity.

Causing URTI (Upper Respiratory Tract Infection)

Natural Ways to improve the immune system

These are some of the immune boosting foods to incorporate into your diet



- Green tea contains the antioxidants which reduces the risk of most types of cancer. It also inhibits the growth of bad bacteria in the intestine

Leafy Vegetables and fruits improves the immune system

Spinach contains vitamin A, lutein, iron, chlorophyll and folate. Which improves the immune system.

- Vitamin A acts as anti oxidants
- Lutein prevent retina deterioration
- Folate and iron supports immunity functioning by developing health RBCs
- vitamin C strengthens your immune system by stimulating antibodies by stimulating the anti bodies and cells in the immune system
- Food sources of vitamin C includes lemon, orange, papaya, mango etc.
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Drink lots of water

Water flushes toxins from the body and allows all our defense systems, including our skin, blood, mucous, and saliva to function properly, discouraging flu and other infections from entering your body.

Conclusion

We can conclude that moderate exercises is really good for your immune system and also to other parts of the body. The goal is to aim for 30 to 40 minutes of the above type of activities, at least five days a week for a better tomorrow

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