

The Susceptibility of Endurance Athletes to Common Illness

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You are experiencing yet another cold, your training sessions have been below average, you are feeling weak and your motivation has sunken to a minimum?

This article is meant to give you a simple overview and easy understanding on the factors that could play a role and may answer the question if or why some athletes are more or less prone to common infections.

Cold & Flu

Many of us misunderstand or wrongly use the terms “cold” and “flu”. Even tho both may present common symptoms it is momentous to differentiate.

Cold:

The common cold is a contagious viral upper respiratory tract infection (VURTI), or acute rhinopharyngitis. Acute rhinopharyngitis has its name from one of the most common viruses causing colds, the so-called human rhinovirus. This type of virus seems to propagate in temperatures between 33-35Celsius, which may be why it is primarily reproduced in the nose.

The second most common virus responsible for colds is called corona virus. Occurring more frequently in mammals and birds, this virus has about 4-5 strains, which can cause viral infection in humans. It is more common in winter and spring time and has the potential to affect the upper as well as lower respiratory tract and cause gastroenteritis.

Time:

- Symptoms normally start to present 2-5 days after infection.
- 4-12 days (some symptoms can last up to 3 weeks),

Common Symptoms:

- Congestions (stuffy/runny nose)
- Blocked sinuses, “full” feeling in the head causing headache
- Sneezing
- Sore throat
- Watery eyes
- Itching in nose, throat and eyes (could go along with conjunctivitis)
- Cough
- Feeling tired
- Fever (lower end)

The severity of cold-symptoms is reduced compared to flu type symptoms.

Influenza (Flu):

Influenza is a more severe viral disease caused by a different type of virus, the so-called RNA pathogens from the family Orthomyxoviridae that affects birds and mammals. There are 3 different forms, Type A (most severe), B (similar to Type A but not as severe) and C (the mildest, similar to

cold-type symptoms).

Influenza is commonly transmitted by coughs and sneezes creating aerosols containing the virus. It may also be transmitted by direct contact with contaminated surfaces, bird droppings or nasal secretion. Influenza may produce nausea and vomiting particularly in the elder or children, though this is more common in the unrelated gastroenteritis, also known as "stomach flu" or "24h flu".

Influenza is continuously mutating new strains, which is also reason for seasonal epidemics. In 2009 a novel flu strain evolved out of human, pig and bird flu. The influenza A/H1N1 virus, which is commonly know as "swine flu". The WHO officially declared a pandemic level 6, which did not indicate its severity but more an indication of spread! The strain actually has a lower mortality than normal flu outbreaks.

The most common vaccine is the so-called TIV (trivalent influenza vaccine). It contains inactivated and purged material from 3 viral strains (2 Influenza A subtypes and 1 influenza B virus strain). It is of very low reactivity and not transmittable. Generally a flu-vaccination in one year may not be effective in the following year, since the virus continuously mutates new strains.

Time:

- Onset of symptoms 1-2 days after initial infection
- Usually between 3-7 days, you should consult a doctor if the symptoms are too severe or if there is no improvement after 1 week. Influenza can turn into more severe illnesses such as pneumonia.

Symptoms:

Generally, flu-symptoms are more rapid in onset and greater in severity than cold-type symptoms. It would typically start with chill/cold sensation, fever and absolute fatigue. People concerned will often be bed-bound and experience severe aches and pains and high body temperature 38-30Celsius. Patients may also present gastrointestinal symptoms such as diarrhoea, vomiting and abdominal pain.

P1. By: http://en.wikipedia.org/wiki/File:Symptoms_of_influenza.svg

Immune System

Definition:

The human immune system is a complicated and dynamic body system responsible for combating infection.

Following activation by foreign substances (pathogens) is the so-called immune response, a complex cascade of events resulting in destruction and inactivation of pathogens, abnormal cells, toxins and foreign molecules.

What affects our Immune Function?

P2. These are possible factors that may affect our immune function.

As endurance athletes it is of great importance to look after a good balance between all of these factors, though many of them are closely related and directly affect our performance.

Let's have a closer look at the ratio of exercise and recovery and training intensity in relation to the susceptibility to common illness.

Sebastian Coe

Frederick Carlton Lewis

In 1987, British Olympian and world record holder over the middle distance Sebastian Coe failed to qualify for the Seoul Olympics due to a severe respiratory illness. In 1992, 9 times Olympian gold medallist and 8 times world-champion Frederick Carlton was unable to qualify for the 100m sprints at the Olympic games due to an infection.

Even tho the general public believe that illness in athletes is rather rare than common, it is more the opposite, which has been researched in several university studies (GLEESON, 2000; NIEMAN et al. 1989; NIEMAN, et al 1990; PETERS, 1997). In fact over the last two decades doctors and coaches of Olympic athletes (summer & winter games) have consistently noticed upper airway infections as a common problem, which seems to be greater than the danger of injury.

Studies have shown that certain immune functions can be suppressed due to high-level exercise or excessive training. Other environmental and physiological factors such as cold and heat exposure, psychological stress, training load and nutrition do play a significant role and may determine the frequency and duration of an infection. (PEDERSON, et al, 1994)

Is this transferable to non-pro endurance athletes?

An Act Of Balance

The amount, duration and intensity of you training must match your current ability. Increase in performance is closely related to the quality of your recovery. Therewith an increase in training should go along with an increase in performance. This can be a very fine line to manage and the prevention of illness or injury is closely related to that.

More recent studies have shown that moderate exercise on a daily basis increases the quality of the body's immune response. It can lead to a temporary boost in the synthesis (production) of macrophages, cells that seek and kill invaders (pathogens such as viruses, bacteria, fungi). Macrophages also release substances that are related to muscle regeneration, growth and repair. Immune cells circulate faster through the body and are more efficient in the way they respond during moderate exercise. The immune system will return to its normal state only a few hours after exercise but this will be prolonged with consistent and regular exercise.

A research conducted by Professor Dr. PH. David Nieman from the Appalachian State University has shown, that people who walk on 70-75% of their VO2 MAX for 40min/day experienced half as many colds or sore throats than people who did not exercise at all.

Salivary proteins such as lactoferrin and lysozyme act as immune barriers preventing infectious agents such as respiratory viruses to activate. PhD candidate Nic West at Griffith University concluded this research by looking at a group of elite rowers.

However, research has also shown that athletes produce certain hormones (e. adrenalin and cortisol) that raise blood pressure and cholesterol levels and suppress immunity during high intensity exercise. This may occur during high intensity exercise of short and long duration.

The state of decreased immunity can last up to 72h post training and therefore is a considerate hazard for athletes to introduce an infection. This is also believed to be the reason why so many endurance athletes get sick after a major race such as a marathon, ironman or long distance multisport events.

It is to be mentioned that even tho there has been done a lot of research, convincing evidence of a cause and effect relationship stays elusive. This is mainly because of the changes and individual fitness levels with athletes participating in such studies.

Should I Train While Being Sick?

Nothing is worse for an athlete than being stuck at home with a cold! The sun is shining, you can see other cyclists racing past you window; I am missing out!

I asked myself the question last time I was sick. I have learned that there is only limited professional answer to that matter.

Nevertheless there is a broadly used recommendation by experts, which supports the opinion that the effect of exercise during illness is strongly related to its severity. This means that it is acceptable to

maintain reduced low intensity exercise for about 45min a day if the symptoms are above you neck and do not include fever. The reasons being that this could stimulate the body's immune system positively and therewith assist in the fight of an infection.

This is a very fine line though, because the immune system is normally severely weakened due to the fight of an infection and other factors as per image P2.

Having tried both methods myself (moderate upper airway infections), I personally made the experience that my immune response is of greater effect if I completely rest and focus on a good recovery! This resulted in a shortened period of illness; sooner start back into training and better performance outcome within the first few training-sessions after infection.

This may be different with each individual athlete but the main priority should be to really listen to your body and notice symptoms early so you can avoid infection and don't miss out on essential training sessions and races.

What To Do?

1. Eat a well balanced diet

It is of great importance and a big part of your post race/training recovery to replace the nutrients that your body needs. This will speed up your recovery, support you immunity and increase your level of performance! It is known that the best effect of replacement after training should happen within the first 2 hours.

2. Maintain adequate sleep

This is also very important, as 3 hours less sleep than normal can suppress immunity immensely. It is absolutely essential for athletes to maintain a good sleep pattern as the body is under continuous physical- and in elite sport also under psychological stress.

3. Avoid over-training

This can cause fatigue, suppress immunity, lower motivation, lower performance and cause injuries. Coaching and a good training plan can assist with keeping a good training/recovery ratio. Over-training happens with the total newbie all the way up to the high performance pro-athlete. Non-pro athletes do have other commitments that have to be considered.

4. Increase your fluid replacement in fall/winter

Due to external factors such as cold temperatures it is very easy to underestimate dehydration and to overlook thirst. A normal person should maintain at least 8 glasses of water a day.

5. Wash your hands frequently

This is an easy one but often seems to be forgotten!

6. Avoid "double-bottling"

He/She might be your best mate and you've known each other from birth. Nevertheless it is an easy way to transmit viruses.

7. Stay warm.

Make sure you stay warm before, during and after training/races. Wear appropriate clothing. The body's ability to shiver and maintain a good temperature is decreased after exercise and races.

8. Avoid having you hands near your mouth, eyes and nose.

Another easy way to transmit pathogens that you may have picked up on the way.

9. When you are already sick.

Stay at home, drink a lot of fluid, keep warm, rest and sleep a lot, think positive and keep up your nutrition! Avoid spreading your virus around the house or public places!

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(GLEESON, 2000; NIEMAN 2000; RONSEN 2001; NIEMAN et al 1989; PETERS 1997; PETERSON, 1997)