



# GOING OUT WITH WET HAIR CAUSES THE COMMON COLD, MYTH OR SCIENCE?

Fleur Strobbe<sup>1</sup>

<sup>1</sup>Master Student Medicine, Radboud university medical center, Nijmegen, the Netherlands

## Introduction

Opinion

We have all heard our mother or grandmother say: “Do not go out with your hair all wet like that, you will catch a cold!”. Just like me, most have never paid much attention to this well-meant warning and dismissed it as if it was nothing. Nonetheless, it has been a much-debated topic for centuries. It is a common folklore that exposure to a cold environment can be associated with the development of the common cold. The theory is that wet hair, clothes and feet can lead to acute cooling of the body surface which in turn can cause symptoms of a common cold. But, as we all know as (bio)medical students, the common cold is caused by a virus. Is it possible that there is a link between viral infections and a cold environment? Is there some truth in this theory linking being cold and the common cold, as it is such a widespread belief?

## The common cold

Before we look further into the question if going outside with wet hair can lead to the common cold, it is important to know what this common cold entails. First of all, the most common symptoms of the common cold are nasal stuffiness and discharge, sneezing, a sore throat and often coughing as well. We, as (bio)medical students, would refer to it as a harmless upper respiratory tract infection caused by a virus infection, most often with a rhinovirus. Although the common cold is a self-limiting illness in most of the cases, the viral infection can spread, which leads to more severe complications such as sinusitis and pneumonia in some cases. In addition, the common cold is an enormous burden on society since it often leads to absences from work [1]. In 2016, according to the Centraal Bureau voor de Statistiek (CBS), (2017), over 41% of the Dutch population reported to have experienced the common cold. The flu and common cold are in every age category the biggest reason for school and workplace absenteeism in the Netherlands. So, even though the common cold is harmless in most cases, it would be beneficial to prevent it. If indeed a relation between acute body cooling and the common cold exists, this could pave the way for preventive measures.

## Viral behaviour

During the winter months, half of the of Dutch young adults and adults experience the common cold, the flu and/or tonsillitis. While in the summertime, it is only one third, according to the CBS (2010). An explanation for this is that viruses spread easier during the winter months because people stay indoors and people are in more close contact with each other as a result. Another contributing factor, in this case, is the increase of indoor heating levels during winter time. There is a continuously recirculated body of air which has a very low humidity, making it easy for a virus to spread. It is also hypothesized that decreased ambient temperature increases physiological stress, consuming more energy for thermoregulation. This effort can, in turn, weaken the immune system, which can lead to an increased susceptibility to infection [2]. In summary, there are plenty of reasonable arguments on why only acute body cooling will not lead to a cold, but is this enough proof?

## Old wife's tale...

An argument that is often used against the so-called “myth”, is that the common cold is caused by a virus and you cannot get a virus from just being cold. A virus can be detected in approximately 80% of the cases of the common cold, most often a rhinovirus [3]. It is thought that in the other 20% of the cases, detection of a virus is not yet possible because

the virus causing the common cold, has not been identified yet [1].

Many articles on the internet state that it is a myth that you can catch a cold from being cold or going out in the cold without wearing a warm jacket. However, most of these articles are not supported by scientific proof, they simply call it an old wives tale. Although research on this topic has been conducted, most studies neither confirm nor deny that there might be a connection. Decades ago, in 1967, an article by Douglas, Couch and Lindgren was published, titled: “Cold does not affect the ‘common cold’ in study of rhinovirus infections”. In their study, different doses of rhinoviruses were used to inoculate volunteers who were free of detectable antibodies to this virus. The test subjects were either placed in a cold room of 4°C or in a water bath of 33°C for up to 2,5 hours. All the test and control subjects who received the highest dose of the rhinovirus became infected, opposed to none of the subjects who received the lowest dose. Based on these results, Douglas et al. concluded that ‘cold’ in the common cold is something of a misnomer [4].

## ... or scientifically proven?

Interesting research concerning the underlying causes of the common cold has been conducted by Ronald Eccles, former director of the Common Cold Centre in Cardiff, Wales. In 2002, he published an article in which he stated a new hypothesis regarding the effects of acute body cooling based on previous research. According to Eccles, acute cooling of the body surface causes vasoconstriction, also in the nose and upper airways. This vasoconstriction leads to inhibition of the local respiratory defences and a subclinical infection can convert into a clinical infection. These local respiratory defences consist out of a non-specific immune response. Because of the vasoconstriction, this non-specific immune response becomes less effective. This reduced effectiveness results from the reduction in blood flow to the airway epithelium, reducing the supply of nutrients and leukocytes to the site of infection. In addition, the temperature of the airway epithelium will drop because of the reduced supply of warm blood. On top of that, cooler temperatures enable replication of the common cold virus by diminishing the immune response [5]. Not everyone infected with a virus will show symptoms, but all the factors stated above can converse a subclinical infection into a clinical infection [6].

Eccles and his colleague Johnson decided to set up a study in which they wanted to determine if acute chilling caused common cold symptoms. They randomized 180 healthy study subjects to receive either a foot chill or control procedure. The group that was assigned to the chilling procedure was asked to take their shoes and socks off and place their

bare feet in a bowl containing up to 10 litres of water. The subjects kept their feet in the 10°C water for twenty minutes. The group allocated to the control procedure was asked to keep their socks and shoes on and they had to place their feet in an empty bowl for the same twenty minutes. Immediately after the procedures, the subjects had to score common cold symptoms. In addition to this, they had to score the same symptoms twice a day for 4 to 5 days. While there was no immediate difference between the two groups, there was a delayed effect of the chilling. The total symptom scores for days 1-4/5 following the chilling procedure were significantly higher than the symptom scores for these days in the control group. Out of the 90 chilled subjects, 26 (28.8%) were suffering from a cold, as opposed to 8 out of 90 (8.8%) control subjects. These results suggest that there is an association between acute cooling of the body surface and the onset of common cold symptoms. Although these results are promising, further research is necessary to determine if the development of these common cold symptoms following exposure to cold is associated with infection [7].

#### Current research at the Radboudumc

Solid evidence is hard to find. Luckily, there is still research being conducted on this matter, also here at the Radboudumc. PhD students Charlotte de Bree, Marlies Noz, Rob ter Horst and Anne Jansen from the Department of Experimental Internal Medicine are currently working on a project to learn more about the influence of cold weather on the response of the immune system. For this project, they and their colleagues collected data from 200 healthy volunteers at the Lowlands festival this summer. Their test subjects took a cold bath of 16°C for 4 minutes. Before and after the cold bath, a bit of blood was drawn from the subjects. With this research, these Radboudumc researchers hope to elucidate the effect of acute cooling on the immune system by testing the susceptibility of isolated cells for the flu virus.

All in all, there might be some truth in the advice given by my mother not to go out with wet hair. Although it is not the reason for giving you a cold, it might trigger one. In the vast majority of common cold cases,

a virus can be detected. Centuries ago, Douglas et al. came to the conclusion that the 'cold' is not a factor in the development of the common cold, but that a virus is. New research has been conducted on this topic since, revising this conclusion. Eccles et al. proved that there is an association between acute cooling of the body surface and the onset of common cold symptoms, but further research is necessary to give a definitive conclusion.

In the context of better safe than sorry even when I am in a hurry, I will dry my hair before I hop on my bike to get to class.

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