Overcoming heat sensitivity

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Our bodies are like an amazing air conditioning unit, and much like an air conditioning unit, it has to be able to sense the temperature and then calculate whether to switch on the heating elements, or switch on the fans and cooling elements to keep our core body temperature of 37ºC (our external temperature of the skin is much more variable).

But unlike an air conditioning unit which has switches and microprocessors, it is our central nervous system that determines whether we are hot or cold, and then relies on our nerves to transmit the resulting instructions to the body. If the central nervous system determines we are hot, it instructs our bodies to produce sweat and increase blood flow to the body's periphery to lose heat. If we are cold, our bodies reduce the blood flow to our extremities, it shivers and we get goose bumps, all in an attempt to keep us warm.

Up to 80% of people with MS experience what is called heat-related fatigue, also known as the Uhtoff's Phenomenon. This occurs when their body temperature increases more than 0.5 degrees and they experience a worsening of their symptoms. Once their body temperature is normalised, signs and symptoms tend to improve. Dr Ollie Jay, at the University of Sydney, has been investigating this phenomenon in a successful pilot study funded by MS Research Australia.

In this study, Dr Ollie Jay, took 21 participants, 12 with MS and 9 without and put them in a state of the art atmospheric controlled exercise chamber in the Thermal Ergonomics Laboratory at the University of Sydney. This allows the researchers to carefully control all aspects of the climate including the temperature, air flow, and humidity. The participants then exercised to increase their body temperature and as they did so their ability to sweat and regulate their blood flow around their periphery was analysed.

The team found that following exercise, people with MS had a reduced ability to regulate their temperature, resulting in about a 0.5 degree increase in body temperature. This was associated with a reduction in sweating and a reduced skin blood flow response, compared to people without MS, which reduces heat dissipation from the skin surface to the surrounding environment via evaporation.

Interestingly, the team also discovered that the perception of temperature in people with MS is altered. They placed items of different temperatures on the skin of participants, and their perception of different temperatures was measured. They found that the ability to perceive different cold stimuli is blunted in people with MS.

These results show that MS affects thermoregulation in two ways. First by affecting the sensing or perception of temperature differences, and secondly MS appears to subdue the body's attempt to shed the excess temperature.

Typically, people with MS try to minimise their exposure to hot environments and reduce exercise to minimise their symptoms worsening. However, there is mounting evidence to suggest regular exercise can be beneficial for people with MS with improvements in the sense of well-being, reduced fatigue, and improved walking abilities.

As such, regular physical activity can be seen as an important component of an overall disease management plan. Therefore, it is important to understand Uhtoff's Phenomenon, in an attempt to hopefully overcome heat sensitivity in people with MS.