Why do people with MS get hotter during exercise?

26th February, 2016

Heat sensitivity in people with MS is well documented, however the underlying physiological mechanisms are still unclear. It is known that very slight increases in core body temperature can affect the speed that damaged nerves are able to conduct signals and hence this may exacerbate the symptoms of MS. However, it is also possible that the lesions of MS could affect the parts of the brain involved in core body temperature regulation.

Ms Georgia Chaseling from the University of Sydney has been awarded a three-year MS Research Australia Postgraduate Scholarship to support her PhD studies investigating how MS impairs human body temperature regulation. In this project, she will study how people with MS respond to increases in ambient temperature during exercise, and what steps may be taken to help people with MS manage heat sensitivity during exercise.
Ms Chaseling's PhD Supervisor, Dr Ollie Jay, oversees a state-of-the-art climate chamber housed in the Thermal Ergonomics Laboratory at the University of Sydney, allowing the researchers to carefully control all aspects of the climate including the temperature, air flow, and humidity.

Ms Chaseling's project will study how individuals with MS respond to different thermal sensations, testing both when the person is at rest and also when the person is performing physical activity in a hot environment. Measurements of skin blood flow, sweat rate, core and skin temperatures will be used to determine an overall estimate of body temperature regulation. Her project will also study whether ingesting a cold drink prior to exercise has any effect on body temperature regulation, such as reducing sweating, core temperature, or reducing the sensation of heat.

This research will provide key insights into how heat regulation may differ in people with MS compared to those without MS, and importantly will assist in the management of heat-related fatigue via the development of clinical guidelines for safe exercise in people with MS.

Researchers from the University of Illinois in the USA, who also collaborate with Dr Ollie Jay, have been studying the response of people with MS to exercise under normal temperature conditions. In particular, they wanted to test whether one of the known benefits of exercise, improvements in brain function, including thinking and memory skills, is impacted by heat sensitivity in people with MS.

Published in the journal *Neurodegenerative Disease Management*, the researchers tested whether excessive changes in core body temperature might outweigh any potential cognitive benefits of exercise. They found that, although the people with MS did experience a significant increase in core body temperature, they still experienced improvements in complex cognitive function. This research highlights that physical activity can still have significant benefits for people with MS despite the problems of heat sensitivity.
This research also highlights the importance of Ms Chaseling's work, helping to identify safe ways to exercise so that people with MS can obtain the fullest benefits of exercise for improving both muscle function and brain function.