

Thermoregulatory Dysfunction in Multiple Sclerosis Patients During Moderate Exercise in a Thermoneutral Environment

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ABSTRACT

Impairments in sudomotor function during passive heat stress have been reported in multiple sclerosis (MS), a demyelinating disease of the CNS that disrupts autonomic function. However, little is known regarding exercise induced increases in core body temperature on thermoregulatory mechanisms in MS. Thus, the aim of this study was to test the hypothesis that thermoregulatory function is impaired in MS patients compared to healthy controls (CN) during moderate exercise. Thermoregulatory function in five patients diagnosed with relapsing-remitting MS and five mass-matched healthy controls were compared during a single bout of cycling exercise (fixed workload of 70 Watts) for 30-60 minutes in a climate-controlled room (25°C, 30% RH). Sweating thermosensitivity (MS: 0.56 ± 0.15 vs CN: 0.81 ± 0.13 , $p=0.04$) was significantly lower while a delay in sweating onset time (MS: 14.8 ± 10.0 min vs CN: 5.6 ± 1.6 min, $p=0.07$) approached significance in MS patients compared to controls. These altered mechanisms of body temperature regulation likely contributed to a greater observed change in core body temperature measured rectally (MS: 0.84 ± 0.34 °C vs CN: 0.37 ± 0.27 °C, $p=0.04$) in patients with MS. This observed thermoregulatory dysfunction in MS patients may intensify disease symptoms limiting exercise tolerance.

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