Exercise Tolerance in a Hot and Humid Climate in Heat-Acclimatized Girls and Women

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This study compared physiological responses associated with exercise tolerance in girls (G) and women (W) of similar fitness and heat acclimatization level during exercise in a hot and humid outdoor environment (33.4°C and 55.1% RH; WBGT = 29.9 ± 0.2°C). Nine pre-menarcheal G (age = 11.3 yr) and nine W (age = 26.8 yr), matched for aerobic capacity and heat acclimatization level, performed a cycling session at 60% VO2max until fatigue. A sports drink was provided periodically to prevent dehydration. Tolerance time was not different between the groups (G = 56.9 ± 6.3, W = 76.5 ± 9.9 min, p > 0.05). During exercise, sweat rate (G = 9.1 ± 1.1, W = 12.0 ± 1.1 ml·m^-2·min^-1), the increase in rectal temperature [Tre] (G = 0.9 ± 0.1, W = 1.1 ± 0.1°C), and heat storage (G = 10.6 ± 5.3, W = 20.5 ± 4.5 W·m^-2) did not differ between the groups. At fatigue, Tre (G = 38.2 ± 0.1, W = 38.4 ± 0.1°C), heart rate (G = 167.3 ± 7.3, W = 171 ± 3.3 beats·min^-1), stroke index (G = 48.3 ± 1.5, W = 52.4 ± 1.8 ml·m^-2), and forearm skin blood flow (G = 9.5 ± 1.3, W = 11.7 ± 1.5 ml·100ml^-1·min^-1) did not differ between the groups. Similar to women, the main reasons reported by girls to stop exercising in the heat were localized leg fatigue and gluteus muscle discomfort. We conclude that heat-acclimatized girls exhibit an adequate cardiovascular and thermoregulatory adjustment while exercising in a hot and humid outdoor environment when hypohydration is prevented.