Is the choice of walking speed in people with a lower limb amputation dependent on the relative aerobic load?

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Although increasing the aerobic capacity is a widely accepted goal in the rehabilitation of people after lower limb amputation, as yet it is unclear to which extent aerobic capacity plays an important role in regaining walking ability. This study investigated the relative aerobic load of people after lower limb amputation during walking at different speeds. Eleven trans-tibial and five trans-femoral traumatic amputees and twenty-one weight and aged matched controls participated in this research (age 61±6.3 years). Peak oxygen consumption was measured while walking at preferred walking speed (PWS) and at speeds 15 and 30% higher and while performing a discontinuous graded one-legged peak cycling test. The fraction of the peak oxygen consumption needed to walk is referred to as 'relative aerobic load'. Relative aerobic load at PWS did not differ between groups (p=0.814). The PWS was, however, significantly lower in both patient groups compared to controls (p<0.001). When the speed of the patient groups was matched with the PWS of the control group the relative aerobic load was significantly higher in the patients compared to controls (p=0.047). It was concluded that patients after lower limb amputation choose a lower PWS corresponding to a relative aerobic load similar to able-bodied controls. Research with healthy subjects has postulated that the PWS is the speed requiring the least oxygen per distance walked. However, preliminary data will be presented suggesting that this might not be the case, considering this speed might entail a relative aerobic load above the acceptable limit in patients.

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