The efficacy of the one-leg cycling test for determining the anaerobic threshold (AT) of lower limb amputees

T. Chin, S. Sawamura, H. Fujita, S. Nakajima, I. Ojima, H. Oyabu, Y. Nagakura and A. Nakagawa
Hyogo Rehabilitation Centre, Kobe, Japan

Abstract
The aim of this study was to investigate whether or not the one-leg cycling test driven by the subject's sound leg as the exercise load method is an applicable method for determining the anaerobic threshold (AT) of lower limb amputees. To evaluate physical fitness, a graded exercise test that monitored gas exchange, ventilation and heart rate (HR) was performed in 51 unilateral lower limb amputees. AT was successfully measured for 42 out of 51 subjects, an 82.3% success rate. The average AT was 12.7± 2.2 ml/kg/min, and the average HR at AT point was 117.7 ±16.2 beats/min. The average peak oxygen uptake was 20.1± 5.6 ml/kg/min, and the average peak HR was 145.1 ± 22.4 beats/min. The peak HR exceeded the HR at AT by an average 27.4 beats/min, which indicates that a comparatively intense exercise load above the AT level is possible. The average AT was 40.9% of the predicted maximum oxygen uptake, which seems reasonable when compared to the reports of other researchers. These results suggested that the one-leg cycling test driven by the sound limb is of use as a method for determining the AT of lower limb amputees.

Conclusion
The applicability of the one-leg cycling test driven by the subject's sound limb as a means of determining the AT of lower limb amputees has been proven. This study has indicated the feasibility of the clinical application of AT in exercise training for amputees.

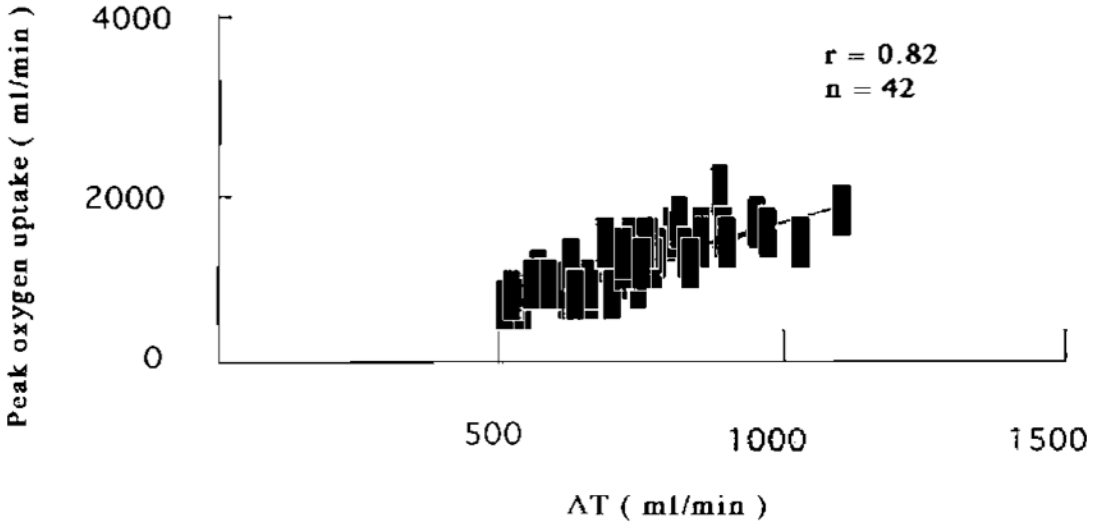

Fig. 3. The relationship between AT and peak oxygen uptake under exercise load. Among the 42 subjects for whom AT was determined a significant correlation was observed between the two factors (r = 0.82, P< 0 001).

PMID: 9285958 [PubMed - indexed for MEDLINE]