ABSTRACT

Introduction: The cardiopulmonary exercise test (CPET) assesses maximal oxygen uptake (VO\textsubscript{2max}) and is commonly performed on a leg cycle ergometer (LC). However, some individuals would rather perform the CPET on an arm cycle ergometer (AC).

Objective: The objectives of this study were to undertake a systematic review and meta-analysis of the difference in VO\textsubscript{2max} achieved by AC compared to LC in healthy adults and to explore factors that may be predictive of this difference.

Methods: MEDLINE, EMBASE, CINAHL, and PEDro were searched in April 2015. The differences in VO\textsubscript{2max} (ACLC\textsubscript{diff}) were pooled across studies using random effects meta-analysis and three different methods were used to estimate the ratio between the values obtained from the tests (ACLC\textsubscript{ratio}).

Results: This paper included 41 studies with a total of 581 participants. The mean ACLC\textsubscript{diff} across studies was 12.5 ml/kg/min and 0.89 l/min with a mean ACLC\textsubscript{ratio} of 0.70. The ACLC\textsubscript{diff} was lower in studies with higher mean age and lower aerobic capacity.

Conclusion: There is linear association between the AC and LC values in healthy adults. The AC values were on average 70% of the LC values. The magnitude of this difference appeared to be reduced in studies on older and less active populations.

Key words: Aerobic capacity, exercise testing, oxygen uptake, leg cycle, arm cycle, ergometer, systematic review, meta-analysis.

Level of evidence: 3a