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Aerobic Fitness protects from Atherosclerotic Cardiovascular Risk Paralympic Athletes with a Locomotor Impairment

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Aim: This study, carried out on Paralympic athletes (PA) with a locomotor impairment (LI), was aimed at:

1. assessing the prevalence of atherosclerotic cardiovascular disease (ACVD) risk factors (RF) in PA with either a spinal cord injury (PA-SCI) or other (different from SCI) LI (PA-OLI);

2. evaluating the hypothesis that aerobic fitness (oxygen uptake peak - VO2peak) was inversely related to ACVD RF.

Methods: A total of 135 male PA (72 PA-SCI, 28 PA with lower limb amputation, 12 PA with a cerebral palsy/brain injury, 7 PA with poliomyelitis, 9 PA with other neurological disorders and 7 PA with other orthopedic disorders) were screened through anthropometric and blood pressure (BP) measurements, laboratory blood tests and graded cardiopulmonary maximal exercise test, to estimate both an ACVD-RF score and VO2peak. The ACVD-RF score was assessed summing 1 point for each of the following RF: obesity –OB- (BMI≥30 or waist circumference ≥102 cm), hypertension –HT- (systolic BP ≥ 140 mm Hg and diastolic BP ≥ 90 mm Hg), dyslipidemia -DL- (total Cholesterol -C- ≥200 mg·dl-1 or LDL-C ≥130 mg·dl-1 or HDL-C <40mg·dl-1), impaired fasting glucose -IG- (fasting plasma glucose ≥100 mg·dl-1) and subtracting 1 point when serum HDL-C was higher than 60 mg·dl-1.

Results: Prevalence of OB, HT, DL, IG and high HDL-C were equal to 5.9% and 3.2%, 13.9% and 14.3%, 58.3% and 49%, 29.2% and 34.9%, 27.8% and 17.4%, in PA-SCI and PA-OLI, respectively. Based on the ACVD RF, 3 groups were formed: group 1 (RF≤0, N=54), group 2 (RF=1, N=41), group 3 (RF≥2, N=40). VO2peak was equal to 37.9±14.71 ml·kg-1·min-1, 30.9±9.13 ml·kg-1·min-1 and 24.1±5.50 ml·kg-1·min-1 in the PA of groups 1, 2 and 3, respectively.

Conclusions: Being VO2peak inversely related to groups of ACDR RF, high aerobic fitness provides a protective effect on ACVD morbidity in PA.

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