often imposed with increasing speed), in order to get an idea of the prognosis (prediction of peak VO2) or submaximal at a constant speed or a self-selected comfortable speed (6-minute walk, for example). Submaximal tests are considered as valuable benchmarks for measuring the response to a standardized activity typically encountered in everyday life. This performance evaluation can be performed before and after an intervention (surgery, medication, rehabilitation) in order to assess its effects. It can also help to assess the quality of life and could be a tool to personalize training programs.

Field tests have the advantage of being simple to perform, well tolerated, require fewer expertise and equipment, and appear well connected with daily activities. However, they have usually a modest correlation with peak VO2, and appear strongly influenced by familiarity and influence the motivation of the subject. The aim of this update is to describe the main walk tests used in the cardiac rehabilitation, their psychometric properties and interests in clinical practice, performed in addition to or instead of maximal stress tests.

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Are ventilatory treshold and 6-minute walk test heart rates interchangeable?

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Keywords: Cardiac rehabilitation; 6-minute walk test; Ventilatory treshold; Heart rate; Assessment

Objectives.– Heart rate (HR) at the ventilatory threshold (VT) remains a benchmark often used in the prescription of exercise intensity in cardiac rehabilitation. Some studies have reported no significant difference between the mean HR at VT and HR measured at the end of the a 6 minutes walk test (6MWT) [1,2]. The aim of this work was to assess the potential equivalence between those parameters with a more appropriate statistical approach.

Method.– Three groups of subjects performed a stress test and a 6MWT: 22 healthy elderly subjects (GES, 7 ± 3.7 years), 10 patients in cardiac rehabilitation after a myocardial infarction (GMI, 53.9 ± 4.2 years) and 30 patients with chronic heart failure (GHF, 63.3 ± 10 years). We analyzed the correlation, bias, 95% confidence interval (95% CI) of the bias and the magnitude of the bias between the HR at the end of 6MWT and HR at the ventilatory threshold.

Results.– There was no significant difference in the mean HR of 6MWD and at VT in the 3 groups, but the 95% CI was wide (30% for the GES, 15% for GMI, 40% for the GHF). The correlation was moderate for GMI (r = 0.78), and low for GES and GHF (r = 0.48 and 0.55, respectively).

Conclusion.– The HR of 6MWT and HR at VT do not appear interchangeable at the individual level in these groups of subjects. To this date, when training prescription aims to target HR at VT, it remains necessary to perform a stress test, or to develop other walk tests after with an exhaustive study of their cardiometabolic requirements.

References

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Comparison of three methods for predicting the maximal oxygen uptake in a population of submariners

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Keywords: Maximal oxygen fitness; Field test; Prediction of maximal oxygen uptake; Aerobic capacity

Introduction.– Maximal oxygen uptake (VO2max) is considered as one of the best indicators of aerobic fitness. It is an important parameter for assessing military populations, particularly in operational units as submariners, to better evaluate their operational abilities.

Purpose.– The objective of this study is to compare the results of an indirect measurement of VO2max with a field-test, and those of a questionnaire for estimating VO2max with the direct measurement of VO2max in laboratory.

Methods.– Forty-seven submariners (aged 29 ± 4.93, 76.7 ± 9 kg weight, regular sports) underwent a progressive maximal cardiorespiratory test on an electromagnetic cycle ergometer and completed the Huet questionnaire annually to determine the athletic ability of the military.

Results.– The mean maximal oxygen uptake found for each test were 46.1 ± 6.3 ml/kg/min for laboratory test on a cycle ergometer, 46.8 ± 7.14 ml/kg/min for the field test VAMEVal, and 52.2 ± 5.4 ml/kg/min for the Huet questionnaire. A positive correlation was found between the field test and the laboratory test (r = 0.40, P = 0.0001), and a good agreement of results. The Huet questionnaire and laboratory test also showed a positive correlation (r = 0.47, P = 0.005) but without a good agreement rate.

Conclusion.– This study shows that, for submariners population, the field test VAMEVAL is correlated and concordant with the results of maximal oxygen uptake measured in laboratory. However, this correlation is mild. The Huet questionnaire allows an assessment if the test is not feasible but with less reliability.

Further reading


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Validity of the Acti’MET calculator: A new tool for estimating physical activity in cardiac rehabilitation

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Keywords: Validation tool; Physical activity; Energy expenditure; Therapeutic education

Introduction.– The Acti’MET calculator was created to provide a quick estimate of weekly energy expenditure, to promote the prescription of personalized Physical Activity (PA) and facilitate support for patients in their practice.

Objectives.– To test the reproducibility of this new tool: inter-rater and intra-examiner validity; To study the correlation between the results obtained with the calculator and those obtained with other evaluation methods validated in coronary artery disease: the Dijon Physical Activity Score (SAP) [1] and the six-minute walk test (6MWT).

Method.– Nineteen patients (59 ± 10 years) hospitalized for cardiac rehabilitation were successively evaluated with the calculator by two observers (interval of 2 hours). They answered the SAP questionnaire and performed a 6MWT. The same criteria were retested on the 3rd day.