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The Anaerobic Threshold: Physiological and Clinical Significance

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Whipp, B.J. (Torrance, Calif.): Respiratory Markers of the Anaerobic Threshold. 47
Cerretelli, P.; Marconi, C. (Milano): Blood Flow in Exercising Muscles. 65
Webber, K.T.; Janicki, J.s. (Chicago, Ill.): Anaerobic Threshold and Aerobic Capacity in the Evaluation of Chronic Cardiac or Circulatory Failure. 79
De Vito, F.; Gattone, M.; Giordano, A.; Tavazzi, L. (Veruno): Limited Value of the Anaerobic Threshold as Quantitative Parameter of Cardiovascular Function in Cardiac without Clinical Heart Failure. 88
Opasich, c.; Cobelli, F.; Riccardi, G.; Aquilani, R.; De Martini, A.; Specchia, G. (Pavia): Applicability of the Anaerobic Threshold in Patients with Previous Myocardial Infarction. 100
Rossi, P.; Prando, M.D.; Occhetta, E.; Aina, F.; Rognoni, G.; Magnani, A. (Novara): Influence of Heart Rate on Anaerobic Threshold. 108
Shrago, E. (Madison, Wise.): Modification of Cardiovascular Function by 'Metabolic Drugs'. 127
Bogaard, J.M.; Scholte, H.R.; Busch, H.F.M.; Stam, H.; Versprille, A. (Rotterdam): Anaerobic Threshold as Detected from Ventilatory and Metabolic Exercise Responses in Patients with Mitochondrial Respiratory Chain Defect. 135
Van Meerhaege, A.; Sergysels, R. (Brussels): Possible Interest of Occlusion Pressure for the Assessment of the Anaerobic Threshold during Exercise in Chronic Obstructive Pulmonary Disease. 146

Contents IV

Versteegh, F.G.A.; Neijens, H.J.; Bogaard, J.M.; Starn, H.; Robijn, R.J.; Kerrebijn, K.F. (Rotterdam): Relationship between Pulmonary Function, O, Saturation during Sleep and Exercise, and Exercise Responses in Children with Cystic Fibrosis. 151
Subject Index. 156

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Introduction

Until a few years ago the approach of the cardiologist to the patient was basically static. The subject was evaluated at rest, the therapy effects were observed in patients in hospital in bed or up and about, and by the means of follow-up. The exercise tests were used almost exclusively as a diagnostic
tool for ischemic heart disease. In the last decade three basic changes have occurred: (1) The development and wide diffusion of noninvasive reliable and repeatable techniques easily applicable during stress has allowed to gain further insight into the cardiovascular dynamics of both patients and healthy subjects. (2) The physiology and medicine of sports have undergone a considerable development thus allowing the study of respiratory and cardiovascular events during exercise on large groups of athletes and ordinary men and women systematically practising physical exercise. (3) The rehabilitation of patients with heart and lung diseases has been recognized as therapeutic practice of which exercise testing and physical training constitute essential parts.

This general development in medical culture has brought about the agreement of ever-increasing numbers of physicians on the need of evaluating the patients in everyday life or at least in well-simulating everyday conditions in the laboratory.

As a consequence, the knowledge of the biological events connected with physical activity is now considered an indispensable part of the physician's culture, and the comparison and discussion of data between physiologists and clinicians have become necessary. This is the basic motivation of the workshop on the anaerobic threshold, whose proceedings are reported here.

The balance between aerobic and anaerobic metabolism resulting from the ratio between the metabolic demand of the tissues and the cardiorespiratory supply of oxygen, is clearly a key aspect of the metabolic pattern of the exercising body.

On these premises the three basic questions this workshop was asked to answer were: (1) How to investigate the dynamics of the aerobic/anaerobic muscular metabolism ratio in patients with heart or lung diseases? (2) Are the parameters used reliable, do they give quantitative answers? (3) Is the anaerobic threshold a parameter of quantitative evaluation of the cardiovascular performance in cardiac patients?

There have been no univocal answers, effect of which mirrors the complexity and many sides of the problems.

The study of the anaerobic metabolism of patients and healthy subjects is still developing: its state of the art is summarized by this workshop in an authoritative manner. In the past, physiologists and clinicians rarely met to discuss a problem with wide and immediate clinical applications: it is desirable that this will occur more frequently in the future.

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