

Relationship between breathlessness intensity during exercise and physical fitness

メタデータ	言語: jpn 出版者: 公開日: 2022-05-30 キーワード (Ja): キーワード (En): 作成者: Takano, Nariko メールアドレス: 所属:
URL	https://doi.org/10.24517/00066134

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 International License.



1997 Fiscal Year Final Research Report Summary

Relationship between breathlessness intensity during exercise and physical fitness

Research Project

Project/Area Number

08670078

Research Category

Grant-in-Aid for Scientific Research (C)

Allocation Type

Single-year Grants

Section

一般

Research Field

Environmental physiology (including Physical medicine and Nutritional physiology)

Research Institution

Kanazawa University

Principal Investigator

TAKANO Nariko Kanazawa University, Faculty of Education, Professor, 教育学部, 教授 (30019559)

Project Period (FY)

1996 - 1997

Keywords

Exertional breathlessness / Exercise training / Physical fitness / Ventilatory chemosensitivity

Research Abstract

In healthy humans, the breathlessness intensity (BS) during exercise increases mainly with an increase in pulmonary ventilation (V_E). Recently, we demonstrated that those with lower hypoxic ventilatory responsiveness of the peripheral chemoreceptors (HVR) exhibited lower BS at given levels of V_E during exercise (J.Physiol.499 : 843-848,1997). On the other hand, it has been reported that those with higher physical fitness tend to have

lower HVR and exertional breathlessness. The following two studies were conducted to examine the influences of HVR and physical fitness, which was evaluated by $\dot{V}_{O_2\max}$, on BS during exercise.

(1) Longitudinal study : Eleven nonathletes were asked to perform an endurance training (20-min running, 3 times/week) for 4 weeks. $\dot{V}_{O_2\max}$, HVR and \dot{V}_E -BS relations during an incremental cycle exercise were measured every week. With the time course of the training, rightward shifts of the \dot{V}_E -BS relation (reduction of BS at given \dot{V}_E), and finally 14%-increase in $\dot{V}_{O_2\max}$ and tendency of lowering of HVR were produced. A multiple linear regression analysis using these data showed that 28% of the rightward shift of \dot{V}_E -BS relation was explained by the increase in $\dot{V}_{O_2\max}$ and 16% by the lowering of HVR. (2) Cross sectional study : \dot{V}_E -BS relation as in the longitudinal study was measured in 14 sprint and 9 endurance athletes. It was found that \dot{V}_E -BS relation was similar in the two types of athletes, in which HVR was similar but $\dot{V}_{O_2\max}$ was much greater in the endurance than in the sprint athletes. In addition, \dot{V}_E -BS relation after 4-week training in the nonathletes was similar to those in the athletes. These results suggest that the sensation of breathlessness during exercise can be reduced by exercise training, with such a training effect mediated partly by increased $\dot{V}_{O_2\max}$ and decreased HVR but largely by familiarization with breathlessness sensation.

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-08670078/086700781997kenkyu_seika_hokoku_

Published: 1999-03-15