

Analysis of the Effects of Short-term Smoking Cessation by Cardiopulmonary Exercise Test and Heart Rate Recovery

Jaesung Cho*, Yoonbae Oh, Dohyun Kim, Jongshill Lee, Sun I Kim, Inyoung Kim and Youngjoon Chee

Department of Biomedical Engineering
Hanyang University, Seoul, Korea

Purpose: The purpose of this study is to compare smoking quitters with non-smokers in relation to VO_2 and VCO_2 trend and the pattern of the post-exercise heart rate recovery.

Method: A group of 20 adults(26 ± 3 yrs) was comprised of smoking quitters($N=10$) and non-smokers($N=10$). All of the participants filled out questionnaires including the smoking history and medical history. The two groups had exercise test on a treadmill with same exercise protocol which has stepwise increasing exercise intensity. The ECG and respiration data were acquired and analyzed on the computer. ECG, VO_2 , VCO_2 , VE and PAEE (physical activity) were measured continuously during the exercise and for 6 min after the exercise. The Experiment group of smoking quitters was tested two days and a day before quitting (D-2, D-1) according to pre-arranged test protocol. For the fairness, the number of times and schedule of testing were identically applied to control group. These tests were conducted for 1-2months. We checked the short-term effect of smoking cessation by analyzing the acquired data on experiment and control group.

Result: As the result of the testing, we found out that there was no significant difference of pattern and its gradient of the heart rate recovery of the non-smokers. But there was significant difference between before and after smoking cessation of the smoking quitters. We could conclude that quitting smoke makes heart rate recovery faster. However, there are no significant differences on VO_2 , VCO_2 , VE, PAEE between two groups.

Conclusion: According to the results of the smoking quitters, HRR(Heart rate recovery) of the post-smoking cessation is faster than pre-smoking cessation. However, if the smoking cessation became longer, the gradient of smoking quitters heart rate recovery could be similar to the non-smokers. Furthermore, it is worth studying about the smokers for the other side of control group.