EFFECT OF TREDMILL AND STATIONARY BICYCLE ON HEART RATE RECOVERY

Chee Cheng Hong, Nor Rasziyah Binti Mohd Rashid, Nur Ain Binti Majid & Kishen Ravi Varma s/o Letchumanan

Introduction: In this study, data was collected to examine the changes of heart rate recovery before and after aerobic training by using two different types of aerobic or cardio machine which are treadmill and stationary bicycle. Heart rate recovery is "the ability of heart to return to normal level after physical activity" (Craig Smith, 2015). Aerobic training is "any physical activity that has the ability to elevate a person's target heart rate and maintain that level for a minimum of 20 consecutive minutes. The aim of the study is to identify the changes towards heart rate recovery after one month aerobic training. Post-test using the treadmill have been utilize to measure heart rate recovery. Heart rate recovery, the speed at which the heart rate returns to normal after exercise, can indicate physical cardiac condition and the risk of certain diseases. For instance, according to the New England Journal of Medicine, people whose heart rate recovery time is long are at higher risk of death than people with shorter recovery times regardless of physical condition or other risk factors (Hannah Kitzmiller, 2013). People who are healthy and in better cardiovascular condition tend to have lower heart rates during peak exercise, and able to return to their resting heart rate more quickly after physical activity.

Methods: Twelve participants, six participants per group, were divided to participate in a study to test the changes of heart rate recovery before and after aerobic training session. The training were divided into two which are 30 minutes treadmill and stationary bicycle. Within the two groups each of the six participants were given a form to record their data. The data was collected by age (19-24 years old), gender (male/female),resting heart rate (RHR), maximum heart rate (MHR), target heart rate (THR) , heart rate recovery (HRrecovery) and heart rate return (HRr) .

Formula:

Maximum Heart Rate (MHR) : 220- age

Target Heart Rate (THR) : Intensity % of MHR

Activity Level: 1/7 days = inactive (60%)

3/7 days = moderate (65%)

5/7 days = active (70%)

Heart Rate Return (HRr) : $\left(\frac{THR-RHR}{2}\right) + RHR$

Before participants starts their training, they will have a pre-test to record their heart rate recovery to have a comparison with post-test after one month, by using treadmill. The duration of the test is 30 minutes. The resting heart rate of each participants will be recorded. After that they will exercising on treadmill and achieve their target heart rate within 10 minutes. The heart rate of the participants during exercise on treadmill will be observed and recorded in every 5 minutes of the test. On 25^{th} minutes of the test, the participants will start to cool down and the heart rate recovery will be recorded on the 26^{th} minutes. The participants will stop the test when they reach their heart rate return.

Results: For treadmill training, the highest differences of pre-test and post-test of heart rate recovery is 6 while for stationary bicycle training the highest differences is 2. The lowest differences of pre-test and post-test of heart rate recovery for treadmill training is -4 and -9 for stationary bicycle training. The average differences of pre-test and post-test of heart rate recovery for treadmill was 1.66 ±4.16. Highest difference was +6 and the lowest was -4. However, the average differences of pre-test and post-test of heart rate recovery for stationary bicycle is -1.66 ±4.08, which are opposite of treadmill training. Highest difference was +2 and the lowest was -9. From the data, we can see that slim participants improve the most on heart rate recovery (average differences= 1.25 ±3.30), followed by normal (average differences= 0 ±3.16) and fat participants (average differences= -2.25 ±6.18).

Discussion: From the analysis of data, the main finding were half of the participants have an improvement on their heart rate recovery while half of them have reduction on heart rate recovery instead of improve. The data between the heart rate recovery of treadmill and stationary bicycle training that acquired had been compared and found that participants who did treadmill training have a greater improvement on their heart rate recovery than participants who did stationary bicycle training. This shows that the bicycle training seems not much effect the cardiovascular system of participants within a short period of time.

Another comparison between the heart rate recovery of male and female participants, the result describe that most male participants have much more improvement compare to the female participants. However, the data may not show the accurate result as there were less female participants compare to the male participants. We assume that this result turn out like that because body size play a role on physical activity level. From that, we know that people with active life will experience higher improvement on their heart rate recovery.

Conclusion: Overall the findings of the result suggest that treadmill training give better improvement than stationary bicycle training. Participants that undergo treadmill training are mostly have greater improvement on their heart rate and heart rate recovery. On the other side, participants that undergo stationary bicycle training does not improve much. The result maybe because while doing treadmill training participant will move their whole body and some force were exerted through the legs and spine while during stationary bicycle training, there are not much more impact on the body as they are doing it in a seated position. However, the general reliability of the study is not ideal as there were many faults during the study which influenced the results, such as participants not motivated enough during training session, data collection was poor as most of them have a poor attendance on training.