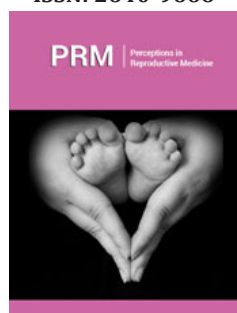


A Critical Review on Anaerobic and Aerobic Exercise: Which One to Choose? The Difference, The Benefits and The Risks

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Introduction

Currently, brand new discussions have been going on how to lose weight, what to do so as to burn more calories, how to be become more fit...etc. When looking at the issue from this point of view, the scientists and the professional sports people have not seemed to collectively agree on which exercise category they should focus on or which type of exercise they can suggest to the sports people about different types of exercises' benefits. On the other side, they do not point out that risks of exercises which can be various in type or occur in sports people or show variabilities from person to person. No matter the person is a weekend warrior or a professional athlete, a diverse training plan which involves different types of exercise, different intensity levels and the one that works different muscle groups is significant.

There are two specific types of training-aerobic and anaerobic-but if the involved person is not a gym addict, it is hard to guess the benefits and risks of each one. Aerobic is defined as "living, active, or occurring in the presence of oxygen." So when it comes down to the difference between aerobic and anaerobic exercise, oxygen is the key factor. As the name implies, aerobic exercise is a type of cardiovascular exercise. While doing aerobic exercise, the oxygen continuously supplies energy to the muscles. Then, large muscles obtain movements from retaining energy. Muscles, in a way, get larger and stronger. The aerobic exercise is to do with oxygen. Oxygen enters the body then the muscles burn fuel and they move.

Unlike aerobic, anaerobic exercises is not related with oxygen supply. Anaerobic exercise is higher intensity exercise meaning that body burns glucose without using oxygen supplies. The crucial point is that the body burns glucose and release energy in a very short period of time while the body's oxygen demands exceed the oxygen supply. Also, unlike aerobic exercise and their constant flow of movement, anaerobic exercise is short in duration at high-intensity levels. It often uses fast-twitch muscle fibers to carry out short bursts of high-powered exercises. The main differences between aerobic exercise and anaerobic exercise are based on the way of storage of energy into body, the intensity level of the exercise and the length of time that a person is able to maintain and suspend the exercise.

Method

Aerobic exercise can be defined as a cardiovascular conditioning which strengthens the person's heart and lungs. The word "aerobic" is known as "with oxygen," because this kind of exercise is fueled by the oxygen that the person gets from breathing (Jamie Smith on September 17, 2019). While the person is exercising, the muscles need more oxygen, which is

carried by the blood, to keep going. This is a situation which causes the heart rate to go up and at the end makes the person breathe deeply and quickly. Thus, the small blood vessels get wider so that they can carry more oxygen to the large muscle groups, like the arms, legs, and hips and this way they enlarge and improve in muscle volume. When doing aerobic exercise, this kind of activity should include repeated, continuous movement. The types of aerobic exercises include:

- a. Running or jogging
- b. Walking, especially at a brisk pace
- c. Swimming
- d. Rowing
- e. Cycling or biking
- f. Jumping rope
- g. Step aerobics
- h. Skiing
- i. Stair climbing
- j. Dancing
- k. Using cardio machines like a treadmill or elliptical.

In contrast, while in anaerobic exercise the body doesn't need oxygen for the muscles to be active, it instead of this uses the energy that's already stored in the muscles. Anaerobic exercise is very similar to aerobic exercise but it uses a different form of energy it is done quickly and immediately. Anaerobic exercises include High-Intensity Interval Training (HIIT), weightlifting, circuit training, Pilates, yoga, calisthenics, such as jumps and squats, plyometrics and other forms of strength training. When doing anaerobic exercise, the person should push the body to work at the highest level of effort.

While talking about the benefits of aerobic exercise in general, aerobic exercises increase the heart rate and breathing rate and boost blood circulation. By this way, aerobic exercise by having used up the whole energy and fresh oxygen in the body it improves a person's cardiovascular health. Thanks to aerobic exercise the person's stamina increase and it reduces fatigue, it helps assisting weight management, lowers blood pressure, increases Trusted Source levels of "good" cholesterol and lowers levels of "bad" cholesterol in the blood. Also, it stimulates the immune system and improves mood of the person and improves sleep. It slows Trusted Source losses in bone density. A 2015 study investigated whether regular aerobic activity reduced a person's mortality risk. The study found that people who engaged in a total of 1-2.4 hours of light jogging over two or three runs per week had a significantly lower risk of mortality than those who did not exercise (Jamie Smith on September 17, 2019).

However, people who practiced strenuous jogging appeared to have the same mortality risk as those who did not exercise at all. This

finding suggests that moderate aerobic exercise can help reduce the risk of mortality, but that high intensity aerobic exercise may not result with any added advantage (Jamie Smith on September 17, 2019). Actually, doing aerobic exercises would be beneficial for most people. However, people should talk to a professional before they begin practicing aerobic exercise if they have a preexisting cardiovascular condition, such as a heart condition, coronary artery disease, high blood pressure...etc. Moreover, a person who has a sedentary lifestyle should also practice physical activity gradually. The sudden introduction of long duration, high intensity aerobic exercise may cause unnecessary stress on the body and harm the cardiovascular system. Likewise, anaerobic exercise has some beneficial effects on a person's cardiovascular health.

When it is compared with aerobic exercise, anaerobic exercise type derives more energy from the body within a shorter time frame. That is why people who want lose weight should choose aerobic exercise to burn fat and glucose in a shorter time. Anaerobic exercise also helps a person gain or maintain muscle mass and increase bone density as it is bursting the energy out of the body making clear that the person is expanding much more energy in a shorter time frame. Anaerobic exercise is putting more pressure on the body and requires higher levels of exertion. As a result, people who want to follow an anaerobic working plan should ensure that they have a basic level of fitness activity before engaging in intense anaerobic workouts. Also, it can be said that it is better to work with a personal trainer when doing anaerobic exercises for the first time. A personal trainer can be alert about the person's position on how to perform the workouts correctly in order to lessen the risks of overexertion or injury.

Result

It is basically known that the human body needs a continuous, permanent supply of energy to perform all daily activities and functions, which it does by transforming the food taken into body to energy. Human body needs full of energy and it is known that when the energy is not supplied the body craves and it stores fat or it burns muscle energy. Thus, nutrition is crucial as the energy from food which is not immediately used is stored in the body, for example as fat or glycogen. Depending on the duration and intensity of any type of physical activity, the body needs to generate energy in the most effective way, and the aerobic and anaerobic processes often complement each other [1]. Anaerobic exercise in a way burns fat by taking oxygen in minimal levels by exercise. In comparison, aerobic exercise uses energy in a most efficient way and burns calories using much more oxygen [2-4].

While the body uses energy from the supplies it also enlarges the muscles, then muscles contains oxygen supplies and uses these as a source to burst into muscles building. Thus, fat is burned during exercise and the body gets exhausted. When the person does anaerobic exercises, the body works exceeding the limits over a short period of time and therefore needs energy in the body in a shorter time. This energy of course is to be supplied from the components that are already stored in the body and are readily

available in the body. Thus, in this process the body doesn't require oxygen, and burns fat fast and the energy comes into terms without oxygen [5,6].

Actually, there seems to be no clear difference between aerobic and anaerobic exercises on a scale so it can be probable to separate them from 'mostly aerobic' to 'mostly anaerobic'. Also, many sports combine a mix of both exercise types. For instance, mostly aerobic walking and jogging includes short bursts of mostly anaerobic sprinting. The specific difference in the results that are taken from

the exercises can be clear in the athletes' physical endurance, their work out plans and their diet. If the athletes' conditions are not appropriate to elevating an intense work out they may experience fatigue or they may not get the desired results. Also, if their diets are not rich in proteins, vitamins, minerals and etc. they may lose muscles or even get serious injuries. What is more, if the work put plans are suitable for their abilities, age and physical endurance, the exercise could be useless or unneedful. Thus, the exercises should be profitable and appropriate for the athletes [7-9]; (Figure 1).

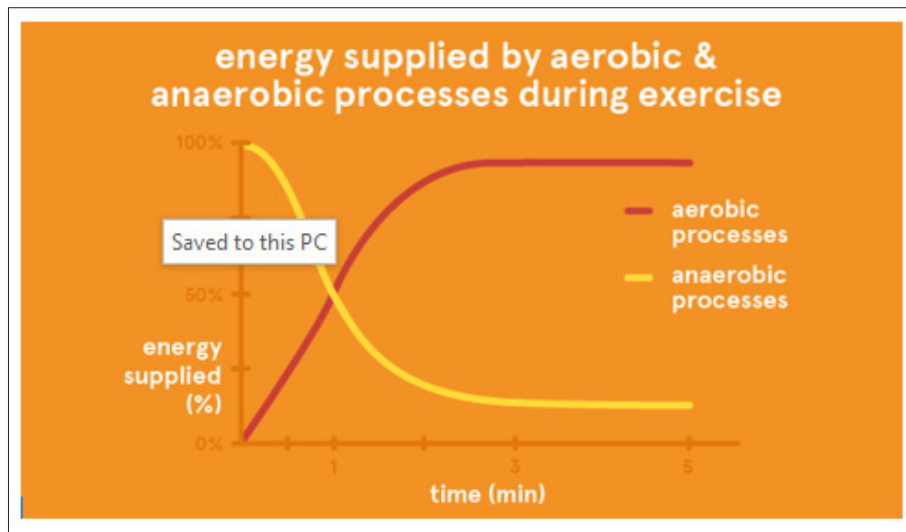


Figure 1: During exercise, our body releases energy via aerobic or anaerobic processes. The intensity and duration of the activity determine which process supplies the most energy. The exact energy contribution is however individual and can be influenced by factors such as amount of training and diet composition [6].

Discussion

It can be stated that both aerobic and anaerobic exercise is crucial for a healthy life. People who would like to sustain a healthy life should choose exercise and doing exercise is not easy as it seems to be. It should be done with obeying the rules of general exercise. While aerobic exercise will mainly increase the cardiovascular endurance and burn body fat, anaerobic exercise will mainly increase the muscle strength, volume and density [10].

In order to get the most benefit from the activities people should focus on some specific points such as;

1. A minimum of at least 150 minutes of moderate-intensity aerobic physical activity throughout the week or at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week or an equivalent combination of moderate- and vigorous-intensity activity.
2. Aerobic activities should be performed in bouts of at least 10 minutes' duration.
3. Additional health benefits, such as even further improvement of bone health and muscular and cardiorespiratory fitness and reduction of the risk of noncommunicable diseases

and depression, can be obtained with more exercise. Adults should aim to increase their moderate-intensity aerobic physical activity to 300 minutes per week, or 150 minutes of vigorous-intensity aerobic physical activity per week. An equivalent combination of both moderate- and vigorous-intensity activity is also an option.

4. Muscle-strengthening or anaerobic activities should be done involving all major muscle groups (legs, hips, back, abdomen, chest, shoulders and arms) on two or more days a week.

For adults over 65 years, the recommendations are the same as the ones listed for the age group 18-64 years. For people over 65 years, it is additionally recommended that those with poor mobility should perform physical activity to enhance balance and prevent falls on three or more days per week [1].

It should be known that anaerobic exercises do not rely on oxygen for energy and do not last as long. With short and intense periods of exercise the person can't take in as much oxygen, so the body ends up producing lactic acid and muscles fatigue more quickly. Thus, when choosing the possibly suitable exercise, the person should know that anaerobic exercise contains much more

risks than aerobic exercise. It can be pointed that aerobic exercise could be better when the person starts from the bottom level to do exercising.

Consequently, it should be noted that doing an exercise than doing nothing no matter what the type of exercise is considered or the exercise has benefits and risks. As it is clear that some exercise is done for weight lost while some are done for muscle building. Whatever the type it can be, a normal person who is not a professional must definitely consult a practitioner, a doctor or a professional. The aerobic and anaerobic exercise benefits the person if they are done in professional manners. They increase muscle strength and bone density, boost metabolism, promote weight maintenance, increase power, increase lactic threshold, fight depression, reduce the risk of disease, protect joints, increase psychological health and mental ability [11].

Even the aim is to lose weight, build muscles or processing a healthy life, doing exercise should be the primary source for the people who chooses these conditions. They should prefer which type is suitable for them according to their exercise plan by immediately consulting a doctor. It should not be underestimated that doing anything recorded for exercise is better than doing a boring diet or doing nothing. The fact is known that choosing an exercise and aiming for good is rather admissible than heading for other ways.

Further research can be conducted on the different risks and benefits of aerobic and anaerobic exercise, the cure and the cause of fatigues during the exercises or after the exercises. Also, some crucial yielding results can be researched about the exercise

types for the young and elderly people as it is important to have a knowledge about which the exercise types are suitable for what kind of people.

References

1. World Health Organization (2010) Global recommendations on physical activity for health. WHO, Geneva, Switzerland.
2. Patel H, Alkhawam H, Madanieh R, Shah N, Kosmas CE, et al. (2017) Aerobic vs anaerobic exercise training effects on the cardiovascular system. *World Journal of Cardiology* 9(2): 134-138.
3. Kent M (2007) *The Oxford dictionary of sports science & medicine*, (3rd edn), Oxford University Press, United Kingdom.
4. Hargreaves M, Spriet LL (2020) Skeletal muscle energy metabolism during exercise. *Nat Metab* 2(9): 817-828.
5. Chamari K, Padulo J (2015) Aerobic and Anaerobic terms used in exercise physiology: A critical terminology reflection. *Sports Medicine-Open* 1(1): 9.
6. Geelen SN, Jansen WL, Geelen MJ, Sloet MM, Beynen AC (2019) Lipid metabolism in equines fed a fat-rich diet. *Int J Vitam Nutr Res* 70(3): 148-152.
7. (2019) National Health Service (NHS). Exercise.
8. Wilmore J (2003) Aerobic exercise and endurance improving fitness for health benefits. *Phys Sportsmed* 31(5): 45-51.
9. De Vos N, Singh NA, Ross DA, Stavrinou TM, Orr R, et al. (2005) Optimal load for increasing muscle power during explosive resistance training in older adults. *J Gerontol A Biol Sci Med Sci* 60(5): 638-647.
10. Difference between aerobic and anaerobic exercise.
11. The difference between aerobic and anaerobic exercise.