

## **Prevention of Coronary Heart Disease Risk with the Tennis Game**

**By:**

**Ahmad Nasrulloh, M.Or.**

### **ABSTRACT**

Coronary heart disease is a disorder that occurs in acute heart as a result of the inability of the heart to supply blood to carry oxygen throughout the body tissues because the narrowing of blood vessels caused by fats that attach to the lining of blood vessels so that blood circulation is not smooth. The most important risk factor in heart disease and blood vessels, namely: (1) age, (2) gender, (3) Descendants, (4) smoking, (5) high blood pressure, (6) High Cholesterol, (7) Less Sports, (8) Excess weight, (9) Diabetes, and (10) Stress.

One of the efforts to prevent the risk of coronary heart disease is to exercise regularly. Sports can be done to prevent coronary heart disease is the dominant sport aerobic system, as with aerobic exercise will help burn fat and cholesterol that can cause blockages in the coronary arteries. Energy systems in sports games the most dominant tennis is aerobic because in this game needs the most energy comes from oxygen. However, in playing tennis should be conducted in accordance with appropriate guidelines such as: (1) Do the exercises as much as 3-5 times a week, (2) Do the exercises in a relatively long time is a minimum of 30 minutes, with heating and cooling enough, (3) Do the exercises with low intensity is between 65% - 75% maximum heart rate, (4) Do emotional control during practice to avoid tension or stress which may increase the frequency of breathing and heartbeat.

Keywords: Coronary Heart, tennis game.

## **INTRODUCTION**

### **A. Problem Background**

The heart is a pump that carries oxygen-carrying blood through the lungs to the entire body. The heart will always work as long as the blood supply in the human body is still there. Through artery coronary blood flow throughout the body. If the walls of blood vessels constrict, so not able to drain blood around the body so there was a heart attack. Narrowed blood vessel walls due to substances contained in the blood gradually settle on nucleus layer. As a result the blood pressure becomes smaller and higher.

Coronary heart disease is a disease that causes death in the world. In the United States each year there are approximately 478,000 people died from coronary heart disease, and 1.5 million people suffer heart attacks as well as in other countries. Coronary heart disease is due to narrowing of the artery coronary due to accumulation of cholesterol or fats in the blood vessels. So we can say that as a result of sudden death from coronary heart disease, closely related to food consumption because of cholesterol or fat obtained only through food consumed daily. In addition coronary heart disease is also caused by a lack of physical activity, so the elasticity of blood vessels less.

At this moment, where the development of increasingly sophisticated technology that causes some people are reluctant to perform physical activity. Someone who should be able to cover the distance by foot, it's been replaced by a motor vehicle. Similarly in the workplace, someone who should be able to do physical activity with the up and down the stairs, but people prefer to use the elevator or escalator. This shows that the increasing technological progress causes a decrease in the level of human consciousness to perform some physical activity.

Lack of physical activity a person will be able to cause a decrease in physical fitness, especially cardio respiratory endurance capacity. Cardio respiratory endurance is the ability of lung and heart to meet the oxygen needs of the human body, so the body will remain fresh, fit, and not easily tired. If a person's ability decreased cardio respiratory, of course needs oxygen in the human body so that shortages may be able to reduce the person's ability to perform daily activities. This is shown by the circumstances a person

susceptible to fatigue, easy to sleep, the body is weak, tired, less passionate, and no passion in the work that will affect work productivity.

Of discourse is clear that lung and heart function is the most important thing in human survival. Therefore, it is necessary to the efforts to keep the lung and heart fitness. In addition, there is need for prevention of coronary heart disease. One of the ways and appropriate measures to maintain, improve heart lung fitness, and prevent the occurrence of coronary heart disease is to do sports activities. Regular exercise and a portion will help the body's health. If exercise conducted for approximately 30 minutes performed at least 3 times a week will help burn body fat and increase elasticity of blood vessels. The sport that can be done is jogging, cycling, marathon, swimming, gymnastics, tennis, and several other sports games.

## **DISCUSSION**

### **A. Definition**

#### **1. Heart**

The heart is a hollow organ, muscle and shape of a cone located between the left lung and right, in an area called the mediastinum, behind the body of the sternum, and two-thirds were located on the left (Waston, 2002: 245). The cardiac function according to Sherwood (2001: 257) is a pump that did the blood pressure gradient to create the necessary pressure so that blood can flow into the network. Therefore we can say that the heart is the organ in the human body is hollow, muscular, cone-shaped with approximately the size of a fist that functions to pump blood with high oxygen content throughout the body tissues through blood vessels as the active energy.

The heart is a muscular organ that is formed from striped muscles such as skeletal muscle, this muscle is often called the heart muscle. Cardiac muscle, although muscle-like vessel, but has a different working system. Working skeletal muscle is influenced by the will, whereas the heart muscle is not influenced by the will. Like Junusul opinion (1989: 146) cardiac muscle tissue properties, which means autoritmic heart contracts do not require the existence of nerve impulses, muscle contraction caused by the depolarization wave originating from a small

part in a special tissue in the atrium called Sini Atrial (SA) node or a pacemaker. Heart muscle have varying levels of thickness of the thickest in the left ventricle, the thinner right ventricle and the thinnest is the atrium.

Heart anatomically is divided into four rooms of the right atrium, left atrium, right ventricle and left ventricle. Right atrium receives oxygen-poor blood from the body through the superior vena cava and inferior, then the blood moves to the right ventricle and is pumped to the lungs to be cleaned. Meanwhile, the left atrium receives blood rich in oxygen from the venous pulmonary, then the blood into the left ventricle and is pumped throughout the body tissue.

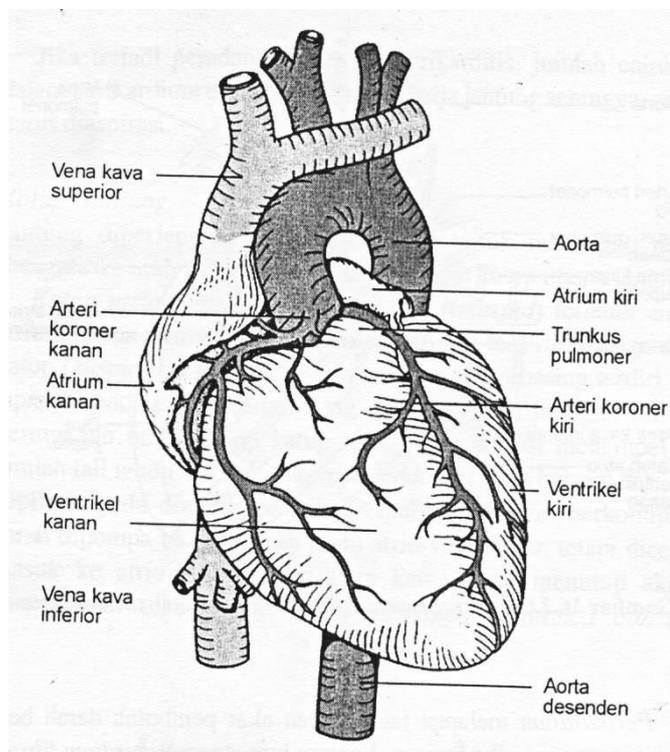


Figure 1. The heart appears from Home

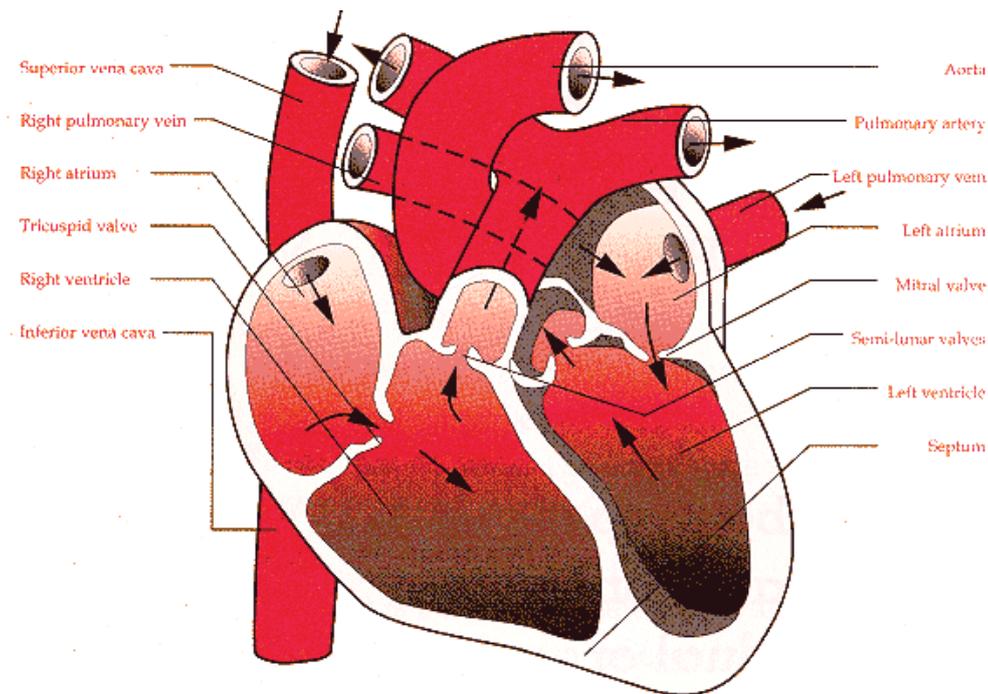


Figure 2. In this section the Right Heart

World health organization was quoted by Knight (2000) provides a definition that coronary heart disease is the inability of acute or chronic heart, arising from lack of blood supply in relation to the process myocardium disease in the coronary vein system. So it can be said that coronary heart disease is a disorder that occurs in acute heart as a result of the inability of the heart to supply blood to carry oxygen throughout the body tissues because the narrowing of blood vessels caused by fats that attach to the lining of blood vessels so that blood circulation is not smooth.

## 2. Tennis Games

According Arma Abdoellah (1981: 502) tennis is one form of exercise uses a small ball and every player wearing a racket like a club. The game is done above ground rectangular concrete, soil with a mixture of fine sand (gravel), and even played on the grass. This tennis court is divided into two with a net as a barrier. Basic principles of playing tennis is to hit the ball over the net and into the opponent's playing field

(Sukadiyanto, 2002: 29). So we can say that tennis is a sports game done in the field of a rectangular shape with a small ball with a racquet to hit over the net and into the opponent's field.

This tennis game can be done by anyone, either male or female, and even mixed. If the game is played by one person against one person is called a single party. If the game is played in pairs, it is called a double party. If multiple parties are played by men and women who each partner is called the mixed doubles party. So it can be concluded that in sports tennis game there are three parties that can be competition single party, multiple parties and parties mixed doubles.

Any form of activity in daily life whether it is a work or exercise require energy (power). The energy required can be obtained from the body of the metabolism of food. If the energy of the body of a shortage of energy will require assistance from outside the form of oxygen obtained through breathing. Similarly in tennis practice also requires good energy from within and from outside the body of oxygen supply on the take by the lungs and is pumped by the heart to all body tissues.

Basically there are two energy systems are required in every activity of human motion is the energy system of aerobic and anaerobic energy systems. Aerobic energy system is a system in the human body to meet energy needs in activities with the help of oxygen obtained through the respiratory system. Anaerobic System is a system in human energy needs while on the move with no need of oxygen, but using the energy stored in muscles derived from metabolic processes in the body. According Sukadiyanto (2002: 26) anaerobic energy systems can be grouped into two systems of alactic anaerobic and anaerobic lactic. Alactic anaerobic system is the ATP-PC system and the system is a system lactic anaerobic glycolysis (lactic acid). The system is in fulfillment of its energy needs do not require oxygen. Energy needs met by the supply of ATP present in the cells (Fox, 1992: 14). In other words it can be concluded that ATP is the first energy source used in any form of muscle work activities.

In the process of fat burning and increase elasticity of blood vessels to prevent the occurrence of coronary heart disease need regular

exercise, measured and programmed. The most appropriate exercise to burn fat and cholesterol is by doing aerobic exercise like running system, jogging, cycling, swimming, and gymnastics. But do not close the possibility for prevention of coronary heart attacks can be done with regular tennis practice. Based on effective timing that is used to play tennis, only 22% of the total time the entire game, so it can be assumed that the main requirement of energy in tennis game is 78% of aerobic and anaerobic as much as 22% (Sukadiyanto, 2002: 33).

## **B. Risk Factors Coronary Heart**

Given that coronary heart disease is the number one killer disease in the world, it is recommended to everyone to be able to do prevention, prevention of risk of coronary heart disease. Before you go any further in the direction of prevention efforts, should someone need to know the risk factors of coronary heart disease. If it can be known with certainty what factors cause this disease, it can take preventive measures to reduce or even avoid death from coronary heart attack. Some preventive measures can be taken is to regulate diet, rest and exercise regularly.

According to Barnard (2002: 26-27) lists the most important risk factor in heart disease and blood vessels, namely: (1) age, (2) gender, (3) Descendants, (4) smoking, (5) high blood pressure , (6) High Cholesterol, (7) Lack of Sports, (8) Excess weight, (9) Diabetes, and (10) Stress.

### **1. Age,**

Age factor is very influential on the risk of coronary heart disease. Most men in the age of 45 years who suffer from heart disease are still able to do many things to improve heart health. This can be done by lowering cholesterol, controlling blood sugar levels, stopping smoking, controlling blood pressure, and doing exercises. In women the risk of coronary heart disease occurred after the menopause ranged between the ages of 51 years. Therefore, for a woman should begin preventive measures before the risk of coronary heart disease occurred.

## **2. Gender,**

In the men have a greater chance of coronary heart disease than in women. As presented above can be seen that men can experience a coronary heart attack at a younger age than in women. This happens because due to several factors such as not eating regularly, healthy lifestyle that less attention, rest and lack of exercise.

## **3. Heredity,**

No doubt that certain heart conditions are just that declined. If someone has a history of heart disease in the family, then someone is likely to experience interference with the heart. This harsh reality can not be changed but with the willingness and effort to conduct prevention, it can be believed that fate can be changed, so have a family history of heart problems or disease is not a death sentence.

## **4. Smoking,**

Smoking is one risk factor for heart disease. This is very clearly conveyed in the cigarette ads that read "Smoking can cause cancer, coronary heart disease, pregnancy disorders, impotence and other" so that from here it is clear that smoking is extremely detrimental health. Also according to McGowan (2001: 4) says that smoking can accelerate the heart rate, lowers the heart's ability to bring and deliver oxygen, lower levels of HDL-C (good cholesterol) in the blood, and causes activation pletelet, is cells that blood agglomerate. Clotting of the arteries tend to form on the heart, especially if there is deposition of cholesterol in the arteries, which can cause heart attacks. One good way is to stop smoking.

## **5. High blood pressure,**

Blood pressure is the force produced by blood flow to each unit area of vessel wall (Guyton, 1993: 265). At the time of pulsing, the heart pumps blood into the blood vessels and increased pressure is called the systolic pressure, whereas when the heart relax, blood pressure fell to its lowest level is called the diastolic pressure. If the pressure exceeds 140

mmHg systolic and diastolic blood pressure exceeding 80 mmHg is consistent, it can be said that blood pressure is high, forcing the heart to work harder in pumping blood throughout the body. This situation will cause the volume of enlarged heart and a change in the artery that will increase the risk of heart disease comes. Therefore necessary efforts to reduce or normalize blood pressure by doing exercise and adjust your diet, so that heart disease can be avoided.

#### **6. High cholesterol,**

The elements of fat and cholesterol and triglyceride levels is one of the risk factors of coronary heart disease. This occurs when the elements are attached to fat blood vessels that can lead to narrowing, which would interfere with the smooth heart in pumping blood throughout the body. To avoid coronary heart disease caused by cholesterol and high triglycerides in the body, the fat consumption should be limited in daily life as more and more to consume more fat, cholesterol also produced. Moreover, it can be prevented by doing aerobic exercise on a regular basis is the dose and appropriate dose of exercise, because aerobic exercise will help burn fat in the body.

#### **7. Poor Sports,**

Lack of physical activity or exercise is often referred to can cause weakness of the heart stroke volume, so that the supply of oxygen to all tissues of the body becomes less. It also can cause the elasticity of blood vessels decreased. Of discourse is clear that the lack of sports activity can be a risk factor for coronary heart disease. Therefore, great effort is required to conduct regular training for at least 30 minutes and is performed at least 3 times a week. With this exercise will be to train the heart muscle and blood vessels become elastic so that the heart can pump blood around the body with a strong network and oxygen needs can be met.

## **8. Overweight**

Technological sophistication that makes some people more reluctant to do the activity causes the accumulation of fat. Also the people who work behind the office desk tend to have excess fat accumulation of the workers in the field. Accumulation of fat in the body that too much will lead to overweight or obesity is often called. People who have excess weight tend to have heart disease risk greater than thin people. Also fat people are also vulnerable to diabetes mellitus disease, high blood pressure, have high cholesterol levels, in which the disease can trigger heart disease. Therefore, begin regular physical activity, manage your diet, and maintaining an ideal weight to coronary heart disease can be avoided.

## **9. Diabetes mellitus,**

According to McGowan (2001: 3) says that diabetes can be defined as a fasting blood sugar levels higher than 125 milligrams per deciliter (mg / dl) after going through repeated measurements. So we can say that is diabetes accumulation in the blood sugar exceeds the normal limit of 125 mg / dl. Diabetes disease is also quite dangerous for the survival of man. However, most patients who died diabetes not because of increased blood sugar levels but complications from a heart condition. Diabetes patients also have excessive cholesterol levels due to excess production of triglycerides. Therefore, immediate lifestyle changes for the better can lower blood sugar levels is to exercise, avoiding sugar and alcohol concentrations.

## **10. Stress,**

According to Barnard (2002: 27), in fact, the tension or stress is not too often leads to heart disease. However indirectly have substantial influence. This is closely related to one's lifestyle is under stress. Lifestyle is not healthy as an escape from the excessive levels of stress such as smoking, drinking alcohol, uncontrolled eating and lazy to do exercise is a cause of heart disease risk.

If the terms of the psychological, that the stress or tension is the pressure or something that was pushed in a person (Sukadiyanto, 2008: 8). In psychological stress is closely linked to anxiety which can cause a person emotional distress. These emotional disturbances will cause a change in biochemical or hormonal changes in the blood, increased heart rate, breathing frequency and blood pressure (Gunarsa, 2004: 73-74). From some discourse that either directly or indirectly can be said that stress can be a risk factor of heart attack. Some simple ways that can be done to reduce stress is regular exercise, breathing exercises, meditation, self control, trying to keep mind and body relax and try to exercise patience. These efforts can be done to prevent a heart attack due to stress.

### **C. Prevention of Coronary Heart Risk with Tennis Games**

Some things have been mentioned in the risk factors of coronary heart disease on the prevention of, among others regulate diet, rest patterns, do not smoke, do not consume alcoholic beverages and doing exercise. One of the efforts to prevent the risk of coronary heart disease is by regular exercise in accordance with the proper exercise dose. This exercise has benefits and important role for human survival, namely (1) may improve glucose and fat metabolism, (2) to improve heart function, lung, muscle work, joints and other organs, (3) to control blood pressure, ( 4) burn fat so that they can lose weight, and (5) improving physical fitness so that labor productivity has also increased. From some of the benefits it could be concluded that exercise can improve heart function, lung, circulatory system and other organ functions that exercise is one of the best ways to prevent coronary heart disease.

Any form of activity in daily life whether it is a work or exercise require energy (power). The energy required can be obtained from the body of the metabolism of food. If the energy of the body of a shortage of energy will require assistance from outside the form of oxygen obtained through breathing.

Basically there are two energy systems are required in every activity of human motion is the energy system of aerobic and anaerobic energy systems. Aerobic energy system is a system in the human body to meet

energy needs in activities with the help of oxygen obtained through the respiratory system. Anaerobic System is a system in human energy needs while on the move with no need of oxygen, but using the energy stored in muscles derived from metabolic processes in the body.

Exercise can be done to prevent the occurrence of coronary heart disease is the more dominant sport aerobic system. Sports that use oxygen as an energy source is well able to meet the necessary oxygen your body can also exercise endurance lung and heart. Besides aerobic exercise can also be used to burn fat in the body if done in a relatively long time, so it can lower cholesterol in the body.

Jogging, swimming, cycling, marathon is aerobic exercise. Did not rule out that there are sports games can also be done in a Volley ball aerobics, basketball, soccer, badminton and tennis. Like they say opinions Sukadiyanto (2002: 33) that based on effective timing that is used to play tennis, only 22% of the total time the entire game, so it can be assumed that the main requirement of energy in tennis game is 78% of aerobic and anaerobic as much as 22%. Of this opinion can be said that the sports games, especially game's most dominant tennis is aerobic because this game needs the most energy comes from oxygen, so the tennis game can be used as an alternative sports in efforts to prevent the risk of coronary heart disease.

Of these phenomena can be concluded that sport tennis game can be used as one way to improve lung function and heart that will improve physical fitness and the risk of heart disease can be prevented. But in doing sports tennis games should be conducted in accordance with appropriate guidelines such as: 1) Do the exercise as much as 3-5 times a week, 2) Do this exercise in a relatively long time that is at least 30 minutes a day, with heating and cooling enough. 3) Do the exercise with low intensity is between 65% - 75% maximum heart rate. 4) Do the emotional control during practice to avoid tension or stress which may increase the frequency of breathing and heartbeat.

## CONCLUSION

Coronary heart disease is a disorder that occurs in acute heart as a result of the inability of the heart to supply blood to carry oxygen throughout the body tissues because the narrowing of blood vessels caused by fats that attach to the lining of blood vessels so that blood circulation is not smooth. There are important risk factors in heart disease and blood vessels that need to watch out for are: (1) age, (2) gender, (3) Descendants, (4) smoking, (5) high blood pressure, (6) High Cholesterol , (7) Lack of Sports, (8) Excess weight, (9) Diabetes, and (10) Stress.

Therefore it is necessary preventive measures to prevent the occurrence of heart disease by regulating the diet, the pattern breaks, do not smoke, do not consume alcoholic beverages and doing exercise. Tennis workout is one way to improve lung function and heart that will improve physical fitness and the risk of heart disease can be avoided. But in doing exercise should be conducted in accordance with appropriate guidelines such as: (1) Do the exercises as much as 3-5 times a week, (2) Do the exercises in a relatively long time that is at least 30 minutes a day, with heating and cooling enough, (3) Do the exercises with low intensity is between 65% - 75% maximum heart rate, (4) Do emotional control during practice to avoid tension or stress which may increase the frequency of breathing and heartbeat.

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