

# CHAPTER I



## INTRODUCTION

Nowadays sport competitions are sharply increasing in Thailand and also around the world. There are lots of athletes from many countries who have triumphantly succeeded in bringing their countries reputation. Sport Associations give much effort in developing their athletes proficiency, skills, peak physical fitness performance and also psychological fitness. The most important point in considering the capability of the athletes in the competition is “how to make our athletes show (act) their capabilities in game as much as possible for the whole competition”. This is what we have studied to find the methods of the quick recovery and full capability to play sports or do sport competition. When playing or completing sports the athletes become fatigue. According to Burke, the causes come from many factors:

1) dehydration, 2) overheating, 3) depletion of muscle fuels, 4) low blood glucose, 5) increased lactic acid level and 6) central fatigue (Burke, 1999). The indicator of fatigue is blood lactate concentration.

Lactate accumulation induces muscular fatigue and is associated with an attenuated ATP production, decreased blood and muscle pH, increased monohydrogen phosphate, glycogen depletion (Booth and Thomason, 1991), decreased lipolysis, and inhibition of glycolytic rate-limiting enzymes. Therefore, for the athletes requirement to perform repeated bouts of high-intensity exercise, it would be beneficial if the rate of lactate clearance was enhanced by training (Oosthuysen and Carter, 1999).

It is necessary therefore to remove lactic acid from their muscles as quickly as possible and turn to recovery stage with low lactic acid accumulation so that the body is able to recover efficiently. This depends on the practice of athletes. Generally, exercising has to be done about an hour or more in order to remove the remaining lactic acid to the normal level by the method of the rest recovery or spending 25

minutes for the recovery of taking rest to decrease lactic acid into half (Fox, 1984). In addition, many other researchers have found that the light exercise recovery results in faster removing of lactic acid from blood than taking the rest alone (Astrand and Rodahl, 1986). Lactic acid can be changed into glucose and/or glycogen by the gluconeogenesis in heart and liver or removed by the oxidation and then changed into carbon dioxide. Lactic acid can be used as an energy when under the aerobic stage, that is lactic acid will be changed to pyruvic acid and then to  $\text{CO}_2 + \text{H}_2\text{O}$ . This method gives the best result in removing lactic acid (Tiidus, 1997).

We can see that  $\text{O}_2$  is an important factor in removing lactic acid. Therefore, circulation also has the important role because the blood brings oxygen to the muscles and also brings the wastes back off the muscles. Then it is essential for the system to work efficiently in the recovery period. As mentioned above, the light exercise recovery results in removing the lactic acid efficiently, but if the athletes are taking rest or in time brake, or waiting for the next competition round and getting some advice, for a short time from their trainers without exercising, they should get a massage called intermediary massage.

Massage is a method generally known for a long time. Getting massage results in to relaxation. The physiological of massage have been attributed to : 1) an increase in local circulation, 2) an increase in cellular permeability and 3) the soothing effect it has on the central and peripheral nerves (Wakim, 1960). Some recent studies indicate that massage results in an earlier recovery than rest alone as it is accompanied by an increase in the total circulating blood volume by shifting plasma, red blood cells (Kresge, 1985), haemoglobin (Arkko et al., 1983), while other studies have reported that the use of massage has no such benefits, at least in respect to quicker lactate elimination or raised circulating blood cell volume (Boone et al., 1991 and Tomasik, 1983). Today, however, there are various kinds of massage, such as the Accupressure, Shiatsu, Swedish massage, Chinese massage, and Traditional Thai massage (Chindewa, 1996). Each of them has its own pattern and technique (Bell, 1999).

The researchers are interested in studying Traditional Thai massage among the competition rounds. The athletes should have time to rest between competition period in order to get rid of the bad effect on muscles, decrease the contraction of muscles, and increase circulatory to get the respiratory system worked efficiently. This will be the advantages to the athletes' bodies for the quicker recovery and enhance the efficiency.

### **Objectives**

To study the effects of Traditional Thai massage on lactic acid removal and the recovery after the aerobic exercise.

### **Research Question**

Can the result of Traditional Thai massage be able to enhance the decrement of lactic acid?

### **Hypothesis**

The effects of Traditional Thai massage can reduce the level of lactic acid in blood and enhances the period of recovery more quickly than the normal resting.

## Assumption

1. The massage in this research is Traditional Thai massage.
2. All subjects should never have leg or knee muscle injury prior to the test.

## Operational Definition

1. Traditional Thai Massage (TTM) is believed to come from India along with the expansion of Buddhism and Indian culture into Thailand. Some scholars speculate possibility of Chinese influences on Thai culture through trading relationships over a long period which also played a part in the development of Thai massage. This, of course, spanned many centuries of history and during this time the art has been refined and shaped into its present system (Tapanya, 2000).

Traditional Thai massage is divided into 2 kinds;

### 1.1 The massage used in the court

This kind of massage, using both hands without the terrible bending or pulling, is normally used for healing.

### 1.2 The massage used outside the court

This kind of massage, using different parts of the body such as hands, knees, elbows, and soles with stretching, bending, or pulling, is used for relaxation (Chindewa, 1996). This study used the massage used outside the court, particularly at the lower extremity muscle.

2. Massage is defined as a form of physical therapy involving rubbing, kneading, and tapping body parts. The massage is used to accelerate healing of sports injuries and to prepare athletes for competition by improving muscle tone and circulation. Its benefits, depending on which form of massage is being used, include relaxation, neural stimulation, increased blood flow, and improved drainage from

lymph vessels. It requires experienced application because of the risk of damage; massage of a recently traumatized muscle may disturb a clot and cause further haemorrhaging. Massage is not advised for those with circulatory, dermatological, or cardiac problems.

3. Lactic acid is defined as an organic acid with the chemical formula of  $\text{CH}_3\text{CH}(\text{OH})\text{COOH}$ . Lactic acid is a product of anaerobic glycolysis. Most of this lactic acid quickly dissociates into hydrogen ions (protons) and lactate. For this reason, the terms of lactic acid and lactate are often used interchangeably. An excessive production of lactic acid is associated with muscle fatigue and certain forms of muscle soreness. It appears, however, that muscle fatigue during high intensity exercise is associated with the protons increasing the acidity in muscles and is not due to a direct effect of lactate.

4. Recovery is defined as the physiological processes taking place in the period following an acute bout of exercise when the body is restored to its pre-exercise condition. Recovery processes include replenishment of muscle glycogen and phosphagen stores, removal of lactic acid and other metabolites, reoxygenation of myoglobin, and protein replacement.

5. Recovery period is defined as period following exercise, when the body is restored to its pre-exercise condition.

### **Expected Benefit and Application**

1. To study the results of Traditional Thai massage on removing lactic acid and, consequently, reducing the fatigue among the athletes.

2. To be able to apply Traditional Thai massage in order to simply use, instead of the general massage, in all kinds of sport, particularly, in which the time brake between the competition rounds is provided. For example, athletics, swimming and gymnastic have 30-minute-time brake up. The applied massage can be used while

taking the rest during the game, which is 10 to 20 minutes, such as basketball, football, rugby, and hockey. This study is conducted for the advantages in developing the competition to further achieving the championship in the circle of sports.