

CHAPTER V

DISCUSSION AND CONCLUSION

Acute stage of moderate aerobic exercise for 30 min resulted in no significant increase in the level of low density lipoprotein diene conjugation. In addition, the different of male and female subjects did not differ significantly in the measures of diene conjugation. The results of this study presented that the baseline data of low density lipoprotein diene conjugation in middle age of sedentary Thai people was 6.93 ± 2.43 micromole per litre (table 4.3). Moreover, this study investigated the baseline data of low density lipoprotein diene conjugation in male and female group was 6.44 ± 1.92 versus 7.30 ± 2.72 micromole per litre (table 4.3). This is the first study to develop conjugated diene method for detecting lipid peroxidation in Thai population. Table 4.2 described the lipid profile data especially low density lipoprotein which in general laboratory, it was detected by calculation. However, low density lipoprotein from this study was analyzed by precipitation method which was a simple and fast method. Additional work to increase the percent of recovery would be very useful for future clinical application.

Since we did not have the lipid profile in our exclusion criteria. In this study, we found 3-5 subject who had dyslipidemia either hypercholesterolemia or hypertriglyceride which might extort our result. For the sake of ethical matter, we had individually informed this findings to each subject who have abnormal lipid profile for their further investigation by physician.

However, the exercise design is an advantage for sedentary population because it didn't alter the level of lipid peroxidation. Therefore, Tidus P.M., 1996 suggested that short-term aerobic training (35 min) increased capacity for flux through the citric acid cycle without necessarily increasing the ability to handle potential free radicals generated by the enhanced electron flux.

This reflects that, though aerobic exercise increase the production of oxygen free radicals and oxidative stress, likely because of electron "leakage" at intermediary

steps in the electron transport chain, (Jill. 1995, Reid M. et al, 1992) but also antioxidant defense mechanism in human body can overcome the handle of free radical production during the exercise in this program.

There are five factors known to increase tissue levels of free radical activity: (1) working for 2 hours or more, (2) any works which give heart rate equals or exceeds 80% maximum heart rate, (3) body fat percents above 15% for men or 20% for women, (4) age above 45 years, and (5) bodyweight above 200 lbs. However, the body has three main endogenous enzymatic defense antioxidants with which it defends itself against free radical exposure: (1) superoxide dismutase (SOD) which destroys superoxide radicals, (2) catalase which catalyses the change of peroxide to H_2O , and (3) glutathione peroxidase which detoxifies peroxides.

Several other exogenous substances have antioxidant scavenging properties known to reduce free radical reactions in human tissue (Passwater, 1985).

Aerobic exercise involves sustained activity at least a moderate level which requires the body to produce and deliver oxygen and nutrients to the cells to maintain this level of output. Aerobic activity is the best method of improving cardiovascular condition, reducing body fat and increasing energy and endurance. Because the body must use stored fuels, mainly fat, for energy, aerobic activity is excellent for weight reduction and burning calories. The downside of aerobic activity is that it is very difficult to do in limited amounts of time, as it usually requires 30 minutes of exercise. The American heart association has recently revised the guidelines for exercise to maintain fitness and recommendations for cardiovascular disease. It includes this intervention program which we had used in our project. It is necessary that it must concern to advise the untrained people. Sedentary subjects may have depleted antioxidant defense mechanism and acute aerobic exercise may increase the level of lipid peroxidation. It has also been found that mildly oxidized low density lipoprotein may circulate in the plasma sufficiently long enough to enter, accumulate, and be degraded in the arterial intima (Juul K., 1996). Hence, measuring levels of circulating oxidized LDL may prove a reliable way of estimating the risk of atherosclerosis. Techniques for determining the extent of LDL oxidation which has occurred in vivo may have some advantages compared to in vitro oxidizability methods (Jialal I, 1996), and in the

present study, we used a method which measures the early events of oxidation (LDL diene conjugation).

To our knowledge, this is the simple and reliable method to measure the oxidative stress during moderate exercise. Ahotupa et al ,1996 (Ahotupa M.,1996) suggested that this is the new method for measurement of oxidation product of low density lipoproteins (LDL) which was fast and simple to perform, and could be applied to clinical purposes. However it still was not the gold standard method and there was no only one biomarker that is the best for assessing lipid peroxidation, especially during exercise. Conjugated dienes appear at the onset of lipid peroxidation and seen to be linked to several steps of lipid peroxide degradation. Conjugated dienes are polyunsaturated molecules having two double bonds separated by one single bond. When attacked by oxygen-centered free radicals, one or more of the double bonds shift to become diene conjugated. However, dienes do not indicate which specific lipid peroxidation products are being measured. Furthermore, they require polyunsaturated fats to be exposed to free radical activity in the presence of lipoprotein. In fact only 30% – 55% lipid peroxidation is actually detected by diene measurement (Alessio HM. ,1993).

However, currently, Jialal I and Devaraj S.,1996 supported the knowledgement that the measurement of conjugated diene was the best index of LDL oxidizability and was clearly the most popular.

Further study should be described the different of intensity of exercise. However, the study which physical activity and oxidative stress is still limitation.

In summary, the guideline of program exercise for preventing coronary artery disease is 50% VO_{2peak} and 30 min. It wasn't altered the level of lipid peroxidation and it can apply to advise sedentary people to perform for promotion their health and prevention coronary disease.