Thesis title Effect of Endurance Training on Hepatotoxicity in Rats Induced by Aflatoxin B_1

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ABSTRACT

Since endurance training is considered as a strategy for prevention or reduction in the severity of disease in many organs and also the high risk in liver damage as high exposure to xenobiotics now a days. Therefore, the effect of endurance training pretreatment on severity of aflatoxin B_1 (AFB_1) hepatotoxicity and the activities of some drug metabolizing and detoxifying system were examined in adult male rats. In the study of endurance training effect, the rats were subjected to swimming with 1% BW resistance for 30 min, 5 days/week for 14 weeks. Endurance training induced high physical fitness as shown by reduction in final body weight (11.73%), reduction in resting heart rate (13.88%), increase in relative heart weight (22.61%), increase in the activities of succinate dehydrogenase (49.11%) and

citrate synthase (152.25%) in gastrocnemius muscle. It also had an activating effect on the activities of aniline hydroxylase and p-nitroanisole-O-demethylase in microsome of liver as shown by 87% and 75.6% increase in both enzymes, respectively. The activation is reversible in 60-72 hours after training. But this did not occur to hepatic glutathione-S-transferase enzyme. Lipid peroxide and glutathione (GSH) content of liver,and liver cell integrity were not affected. Water immersion had not any significant influence.

In the study of severity of hepatotoxicity, the rats were pretreated with similar endurance training program followed by single i.p.injection of AFB_1 in a dose of 2 mg/kg BW. The hepatotoxicity, some drug metabolizing and GSH detoxifying system and histopathological changes were investigated at 0, 12 and 24 hours after AFB_1 administration. It has shown more increase in the activities of serum alanine aminotransferase (8 folds), aspartate aminotransferase (1.8 folds) and severe histopathological changes at 24 hours in trained group after AFB_1 administration. These results suggested that endurance training pretreatment enhanced the severity of hepatocellular necrosis at 24 hours after AFB_1 administration. More increased in hydroxylation and relative lower detoxification via GSH conjugation at the initial and 12-24 hours after AFB_1 administration were likely to be the enhancing factor. Lipid peroxide

contributed to AFB_1 hepatotoxicity but it was not the enhancing factor in this case.

However, the activation on the phase I metabolism by training may lead to less hepatotoxicity if lower dose of AFB_1 is administered. Further studies are warranted.