

Plasma Collagen XVIII in Response to Intensive Aerobic Running and Aqueous Extraction of Black *Crataegus Elbursensis* in Male Rats

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Abstract : Aim: The adaptations that occur in human body after doing exercises training are a factor to help healthy people stay away from certain diseases. One of the main adaptations is a change in blood circulation, especially in vessels. The increase of capillary density is dependent on the balance between angiogenic and angiostatic factors. Most studies show that the changes made to angiogenic developmental factors resulted from physical exercises indicate the low level of stimulators compared with inhibitors. It is believed that the plasma level of VEGF-A, the important angiogenic factor, is reduced after physical exercise. Findings indicate that the extract of crataegus plant reduces the platelet-derived growth factor receptor (PDGFR) autophosphorylation in human's fibroblast. More importantly, crataegus (1 to 100 mg in liter) clearly leads to the inhibition of PDGFR autophosphorylation in vascular smooth muscle cells (VSMCs). Angiogenesis is a process that can be classified into physiological and pathophysiological forms. collagen XVIII is a part of extracellular protein and heparan sulfate proteoglycans in vascular epithelial and endothelial basement membrane cause the release of endostatin from noncollagenous collagen XVIII. Endostatin inhibits the growth of endothelial cells, inhibits angiogenesis, weakens different types of cancer, and the growth of tumors. The purpose of the current study was to investigate the effect of intensive aerobic running with or without aqueous extraction of black *Crataegus elbursensis* on Collagen XVIII in male rats. Design: Thirty-two Wistar male rats (4-6 weeks old, 125-135 gr weight) were acquired from the Pasteur's Institute (Amol, Mazandaran), and randomly assigned into control (n = 16) and training (n = 16) groups. Rats were further divided into saline-control (SC) (n=8), saline-training (ST) (n=8), crataegus pentaegyna extraction -control (CPEC) (n=8), and crataegus pentaegyna extraction - training (CPET) (n=8). The control (SC and CPEC) groups remained sedentary; whereas the training groups underwent a high running exercise program. plasma were excised and immediately frozen in liquid nitrogen. Statistical analysis was performed using a one way analysis of variance and Tukey test. Significance was accepted at P = 0.05. Results: The results show that aerobic exercise group had the highest concentration collagen XVIII compared to other groups and then respectively black crataegus, training-crataegus and control groups. Conclusion: In general, researchers in this study concluded that the increase of collagen XVIII (albeit insignificant) as a result of physical activity and consumption of black crataegus extract could possibly serve as a regional inhibitor of angiogenesis and another evidence for the anti-cancer effects of physical activities. Since the research has not managed in this study to measure the amount of plasma endostatin, it is suggested that both indices are measured with important angiogenic factors so that we can have a more accurate interpretation of changes to angiogenic and angiostatic factors resulted from physical exercises.

Keywords : aerobic running, *Crataegus elbursensis*, Collagen XVIII

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