Project Title Effect of acute exercises, chronic exercise training and vitamin C supplementation on physiological change and symptoms in allergic rhinitis patients.

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Abstract

The aim of this present study was to investigate an effect of acute exhaustive and moderate intensities exercises, exercise training and vitamin C supplementation on physiological change and rhinitis symptoms in allergic rhinitis patients. There were two studies; Study I : The subjects, aged18-45 years old, were divided into 2 groups: 14 healthy individuals and 13 allergic rhinitis (AR) patients. They were assigned to perform the strenuous exercise on treadmill by using Bruce protocol until they were exhausted. Two weeks later, they were assigned to perform a moderate exercise by walking on treadmill for 30 minutes at 65-70% of heart rate reserve (HRR). Study II : Twenty-seven volunteered patients with allergic rhinitis, aged 18-45 years old, were recruited. They were randomized into 3 groups: control group (CON; n=8), exercise group (EX; n=9) and exercise combined with vitamin C group (EX + Vit. C; n=10). The exercise training protocol consisted of walking - running on a treadmill at 65-70% HRR, 30 minutes per session, 3 times a week. The EX + Vit. C group ingested vitamin C 2,000 mg per day.

Results of the study are as follow :

Study I: After both acute exhaustive and moderate intensities exercises, volume of nasal inspiratory flow were increased but nasal congestion was decreased ($p<.05$). In addition, nasal blood flow was decreased after performing moderate exercise in both groups of subjects ($p<.05$). The ratio of IL-2 and IL-4 (IL-2/IL-4) after moderate exercise was significantly higher than exhaustive exercise in both the healthy and AR groups ($p<0.05$)

Study II: After 8 weeks, malondialdehyde (MDA) levels of the both EX and EX + Vit. C were significantly lower than the CON group ($p < .05$). The both EX and EX + Vit. C had significantly lower in interleukin (IL)-4 levels but higher in IL-2 than the CON ($p < .05$). After nasal challenge by house dust mite (*D.pteronyssinus*), the percent difference of IL-4 and IL-13 were significantly lower but the percent difference of IL-2 were significantly higher in the both EX and EX + Vit. C when compared with the CON ($p < .05$).

For rhinitis symptoms, the percent difference of peak nasal inspiratory flow (PNIF) were significantly higher while nasal blood flow were significantly lower in the both EX and EX + Vit. C comparing to the CON ($p < .05$). Moreover, the both EX and EX + Vit. C had a significantly higher PNIF after nasal challenge 60 minutes comparing to pre-test ($p < .05$). The rhinitis symptoms score i.e. congestion, itching, sneezing, rhinorrhea and total symptoms at baseline and following nasal challenge were significantly decreased in the both EX and EX + Vit. C ($p < .05$).

In conclusion, acute exhaustive and moderate intensities exercises increased peak nasal inspiratory flow and decreased nasal congestion in allergic rhinitis patients. But only moderate exercise also reduced nasal blood flow in allergic rhinitis patients. Eight weeks of moderate exercise training with and without vitamin C supplementation demonstrated improving cardiorespiratory fitness, attenuating the inflammatory response and reducing symptoms in patients with allergic rhinitis. Therefore, regularly moderate exercise training should be recommend for allergic rhinitis patients.