

Mistletoe Supplementation and Exercise Training on IL-1 β and TNF- α Levels

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Abstract : Introduction: Plyometric training (PT) is popular among individuals involved in dynamic sports, and is executed with a goal to improve muscular performance. Cytokines are considered as immunoregulatory molecules for regulation of immune function and other body responses. In addition, the pro-inflammatory cytokines, TNF- α and IL-1 β , have been reported to be increased during and after exercises. If some of the cytokines which cause responses such as inflammation of cells in skeletal muscles, with manipulating of training program or optimizing nutrition, it can be avoided or limited from those injuries caused by cytokines release. Its shows that mistletoe extracts show immune-modulating effects. Materials and methods: present study was to investigate the effect of six weeks PT with or without mistletoe supplementation (MS)(10 mg/kg) on cytokine responses and performance in male basketball players. This study is semi-experimental. Statistic society of this study was basketball player's male students of Mahmoud Abad city. Statistic samples are concluded of 32 basketball players with an age range of 14-17 years was selected from randomly. Selection of samples in four groups of 8 individuals Participants were randomly assigned to either an experimental group (E, n=16) that performed plyometric exercises with (n=8) or without (n=8) MS, or a control group that rested (C, n=16) with (n=8) or without (n=8) MS. Plants were collected in June from the Mazandaran forest in north of Iran. Then they dried in exposure to air without any exposition to sunlight, on a clean textile. For better drying the plants were high and down until they lost their water. Each subject consumed 10 mg/kg/day of extract for six weeks of intervention. Pre and post-testing was performed in the afternoon of the same day. Blood samples (10 ml) were collected from the intermediate cubital vein of the subjects. Serum concentration of IL-1 β and TNF- α were measured by ELISA method. Data analysis was performed using pretest to posttest changes that assessed by t-test for paired samples. After the last plyometric training program, the second blood samples were in the next day. Group differences at baseline were evaluated using One-way ANOVA (post-hock Tukey) test is used for analysis and comparison of three group's variables. Results: PT with or without MS improved the one repetition maximum leg and chest press, Sargeant test and power in RAST ($P < 0.05$). However there were no statistically significant differences between groups in Vo2max measures ($P > 0.05$). PT resulted in a significant increase in plasma IL-1 β concentration from 1.08 ± 0.4 mg/ml in pre-training to 1.68 ± 0.18 mg/ml in post-training ($P=0.006$). While the MS significantly decreased the training-induced increment of IL-1 β ($P=0.007$). In contrast, neither PT nor MS had any effect on TNF- α levels ($P > 0.05$). Discussion: The results of this investigation indicate that PT improved muscular performance and increases the IL-1 β concentration. Increasing of IL-1 β after exercise in damaged skeletal muscle has shown of the role of this cytokine in inflammation processes and damaged skeletal muscle repair. However mistletoe supplementation ameliorates the increment of IL-1 β levels, indicating the beneficial effect of mistletoe on immune response following plyometric training.

Keywords : mistletoe supplementation, training, IL-1 β , TNF- α

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