Abstract 6  Effects of exercise on heart rate, apoptotic ratio, and Bax and Bcl-2 gene expression

<table>
<thead>
<tr>
<th>Group</th>
<th>Heart index (%)</th>
<th>Apoptotic ratio (%)</th>
<th>Bax gene</th>
<th>Bcl-2 gene</th>
<th>Bax/Bcl-2 ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.27 (0.01)</td>
<td>0.76 (0.562)</td>
<td>0.22 (0.070)</td>
<td>0.21 (0.094)</td>
<td>1.239 (0.621)</td>
</tr>
<tr>
<td>MT</td>
<td>0.32 (0.01)</td>
<td>2.30 (1.552)</td>
<td>0.24 (0.076)</td>
<td>0.19 (0.732)</td>
<td>1.414 (0.615)</td>
</tr>
<tr>
<td>HT</td>
<td>0.30 (0.02)</td>
<td>7.21 (2.776)</td>
<td>0.29 (0.037)</td>
<td>0.17 (0.106)</td>
<td>1.731 (1.844)</td>
</tr>
</tbody>
</table>

Values are mean (SD).

C, Control; MT, middle intensity training; HT, high intensity training.

was significantly different in the HT group from the C (p<0.05) and MT (p<0.05) group (table). Endurance training induced myocardial hypertrophy and cardiomyocyte apoptosis at the same time. High volume training had more effect on cardiomyocyte apoptosis. The interaction of the Bax and Bcl-2 genes played a major role in regulating exercise induced cardiomyocyte apoptosis.

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THE ERGOGENIC EFFECTS OF EURYCOMA LONGIFOLIA JACK: A PILOT STUDY

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Eurycoma longifolia Jack (ELJ), which contains quassinoids such as eurycomalacton, eurycomayan, and eurycomanol, has been reported to have aphrodisiac properties and to increase testosterone levels in men. Previous studies have established that the testosterone supplementation increases fat free mass, muscle strength, and muscle mass, which are important for physical function and athletic performance. Thus, the objective of this study was to investigate the effect of the increase in testosterone levels, obtained by administration of ELJ, on body composition and muscle strength and size in man. Fourteen healthy men performed an intense strength training programme with initial load of 60% RM (2 sets of 10 repetitions with 1 minute rest between, for 10 stations) on alternate days for five weeks. Simultaneously, seven men were randomly selected to consume 100 mg/day ELJ water soluble extract, and seven men received placebo. The intensity of the exercise was increased by 10% RM/week. Body composition, arm circumference, one repetition maximum (1RM), and surface electromyography (sEMG) activity were measured and recorded one day before and after the five weeks of supplementation and intervention. The lean body mass of the treatment group showed a significant increment, from 52.26 (7.18) kg to 54.39 (7.43) kg (p = 0.012), but no significant changes in fat free mass were observed in the placebo group. Percentage body fat was significantly decreased in the treatment and placebo group, from 31.30 (5.48)% to 28.44 (6.43)% (p = 0.01) and from 22.83 (2.43)% to 21.33 (2.35)% (p = 0.001) respectively. The 1RM test showed a significant increase from 73.71 (16.63) to 78.71 (17.07) kg (p = 0.006) in the treatment group and from 77.29 (8.9) to 79.43 (8.8) kg (p = 0.011) in the placebo group. The increase in strength in the treatment group was larger than in the placebo group (6.78% and 2.77% respectively). The mean frequency of sEMG on the biceps in the treatment and placebo groups decreased significantly, from 121.77 (40.0) to 90.47 (64.6) µV (p = 0.012) and from 127.95 (30.9) to 98.88 (50.1) µV (p = 0.036) respectively. The treatment produced 92% greater reduction in electrical activity of the muscle measured at the end of the experiment compared with placebo. The mean arm circumference of the treatment group increased significantly by 1.8 cm after the supplementation, from 30.87 (1.88) to 32.67 (1.96) cm (p = 0.011), but there was no significant increase in the placebo group. The results suggest that water soluble extract of Eurycoma longifolia Jack increased fat free mass, reduced body fat, and increased muscle strength and size, and

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CARBOHYDRATE/ELECTROLYTE REPLACEMENT IN SOCCER PLAYERS

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The aim of this study was to examine the effects of a carbohydrate/electrolyte drink on specific soccer tests and performance. Twenty professional male soccer players volunteered to participate. They were allocated to one of two trials in which either carbohydrate/electrolyte drink (8% carbohydrates) or placebo was ingested during a 90 minute soccer match. The trials were matched for subjects’ age, weight, height, maximal oxygen uptake, and playing positions. Immediately after the match, players completed six soccer specific skill tests. Subjects in the carbohydrate/electrolyte trial finished the specific dribble test faster those in the placebo trial (12.1 [0.8] v 13.2 [0.7] seconds; p<0.05). Ratings of the precision test were higher in the carbohydrate/electrolyte trial than the placebo trial (16.8 [4.7] v 15.0 [4.1]; p<0.05), and the 20 m shuttle run test times were higher in the carbohydrate/electrolyte trial (721.8 [63.2] v 654.2 [45.5] seconds; p<0.05), but there were no differences in coordination test, balance test, and power test results between trials. The main finding of this study indicates that supplementation with carbohydrate/electrolyte solution improved soccer specific skill performance and recovery after a soccer match compared with ingestion of placebo.

EFFECTS OF ENDURANCE TRAINING ON CARDIOMYOCYTE APOPTOSIS AND ITS RELATED GENE EXPRESSION

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This study aimed to investigate cardiomyocyte apoptosis and Bax and Bcl-2 gene response to endurance exercise of different intensity. Sixty male Sprague-Dawley rats were randomised to a sedentary control group (C), middle intensity training group (MT), and high intensity training group (HT). Rats in the latter two groups ran on treadmills at 30 m/min and 36 m/min respectively for 60 minutes a day for 12 weeks. Hearts were removed and weighed 24 hours after training. The apoptotic ratio was measured by flow cytometry.1 Bax and Bcl-2 gene expression were tested by QRT-PCR assay.2 The heart to body weight ratio (heart index) increased significantly in the MT (p<0.01) and HT (p<0.05) group compared with the C group. The apoptotic ratio increased in both the MT and HT group. Although no significant differences occurred between the MT and C groups, significant increases were observed in the HT group compared with the C (p<0.01) or MT (p<0.05) group. Bax expression increased and Bcl-2 expression decreased in both training groups, but no significant difference between these groups was observed. Only the Bax/Bcl-2 ratio 465

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