

ABSTRACT

Title:

Physical profile of judo athletes and its changes due to body weight reduction

Aim of work:

The aim of this study was to determine the effect of intensive pre-competitive body weight reduction on body composition, anthropometric parameters, postural stability, reaction time, maximal isometric muscle strength and biochemical parameters in the blood of elite judo athletes.

Methods:

The work compares the results of laboratory testing at the beginning and at the end of body weight reduction. Nine male judo athletes (age 22.3 ± 2.4 years) from the Czech national team participated in the research. For laboratory testing we used bioelectrical impedance analyser InBody 720, anthropometric equipment, pressure plate FootScan, dynamometer and apparatus for measuring reaction times of Biomedical laboratory UK FTVS and equipment for the collection of capillary and venous blood. We created a survey to gather more information about pre-competitive weight loss, attended by 53 competitors (37 men and 16 women, mean age 23.7 ± 3.2 years) who practise judo, wrestling Greco-Roman and freestyle, boxing, kickboxing, thaibox, taekwondo or karate.

Results:

We found a statistically significant ($p < 0.01$) reduction of body weight, average weight loss was 4.6 % (on average 3.4 ± 1.6 kg). This reduction was reflected in all parameters of body composition, skinfold thickness and circumferences of body segments. The largest decline was recorded in the amount of total body water (TBW), which decreased by 1.82 l, i.e. 3.5 % ($p < 0.05$) and fat-free mass (FFM), which decreased by 2.44 kg, i.e. 3.4 % ($p < 0.05$). We noticed significant decline of anthropometric parameters such as circumference of waist, hips, calves ($p < 0.05$) and thighs ($p < 0.01$) and some skinfolds (back, abdomen, hips, thighs - $p < 0.05$ and chest II - $p < 0.01$). We observed significant

($p < 0.05$) reduction of maximal isometric muscle strength only in trunk flexion. We did not find any significant differences in results of reaction times, postural stability as well as parameters of complete blood count. In biochemical parameters in blood we observed statistically significant decrease of triacylglycerols (TAG) ($p < 0.05$) and logarithmic ratio of triacylglycerols and HDL cholesterol ($p < 0.01$) and significant increase ($p < 0.05$) of immunoglobulin G (IgG) and immunoglobulin A (IgA).

The results of survey focused on body weight reduction showed that 77.4 % of participants (75.7% men, 81.3% women) regularly reduce their body weight before competition and this reduction is on average 5.4 % of body weight (6.0 ± 3.2 % for men, 4.1 ± 1.5 % for women). The most commonly applied body weight reduction methods included fluid and food restriction, diet changes and increased physical activity often in special rubber clothes for increased sweating.

Keywords:

Judo, weight category, body composition, anthropometry, postural stability, reaction time, dynamometry