COMPARISON OF VARIOUS METHODS FOR ASSESSMENT OF BODY FAT

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Introduction: Body composition is an important indicator of men's nutrition and health status. It depends on many factors. Nutrition and physical activity are the main determinants of body composition except heredity and hormonal aspects. We can use different methods for assessment of body composition. Some of them are more accurate, more exacting and more expensive than the others.

Methods: The aim of this study was to compare selected methods for measurement of body composition especially of the body fat. In year 2006 the body composition was assessed in the group of 57 overweight adults (9 men and 48 women). They were included in two year interventional program for reducing their weight by changing the life style (alimentation and physical activity). Institute of Physiology and Pathophysiology (Medico-Social Faculty, University of Ostrava), Department of Physiotherapy (Vítkovice Hospital in Ostrava) and Department of Preventive Medicine (Faculty of Medicine and Dentistry, Palacký University of Olomouc) have been cooperating on this interventional program. Basic anthropometric parameters were measured: body height (cm), body weight (kg), weight/height ratio – BMI (kg/m^2), circumference of waist 1 (cm) (between the 12th rib and crista illiaca) and circumference of waist 2 (cm) (on the level of navel). These methods were used for determination of body fat: skin fold thickness measurement (Best's caliper) by Pařízková (1977) (kg of fat), bioelectrical impedance – BIA (apparatus TANITA BF 556 and TANITA BC-418) (kg of fat), dual-energy X-ray absorptiometry – DXA (apparatus Hologic Discowery W) (kg of fat) and abdominal computer thomography – CT on the level of L4–L5 for total abdominal fat assessment (mm^2 of fat). The results of the methods were compared by correlation and regression analysis and Student's paired t-test ($\alpha = 5$ %).

Results: Data of the first examination and first control examination (after 6 months) was analysed. We found significant relationship between circumferences of waist 1 and waist 2 in the group of men (R = 0.965) and women (R = 0.924), between abdominal CT and circumferences of both waists by men and women (R = 0.764, R = 0.837). BMI correlated with amount of body fat assessed by fold thickness measurement by Pařízková, BIA and DXA and with results of abdominal CT very well (R > 0.810) in our tested groups of men and women. Very good correlation was found between results of DXA and results of methods BIA, fold thickness measurement and abdominal CT (R = 0.903, R = 0.977). There were non-significant differences in amount of body fat assessed by DXA and BIA by men and women. The results of method by Pařízková were significantly lower than the results of DXA (p < 0.001) in the group of women.

Conclusion: Results of compared methods correlate very well. No significant difference is between results of methods DXA and BIA, the results of method by Pařízková are significantly lower. These results are preliminary. The interventional program will be ended in the year 2008 and all data (results of the first examination and two control examinations) will be evaluated.