

OBESITY AS DETERMINANT OF HEALTH - INTERVENTION INDIVIDUAL REDUCTION PROGRAMME OF WEIGHT FOR PATIENTS WITH OVERWEIGHT AND OBESITY

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Introduction

- Obesity influences health status of the individual especially metabolic indicators, cardiovascular and locomotor system.
- One aim of this study is evaluation of results of intervention reduction programme of weight on the base of change of basic anthropometric data, biochemical indicators and results of ergometric investigation.

Statistic methods

The values from first nad control investigation were compared by using of paired t-test on the level of importance 5%. For analysis of dependence of parameters correlation and regression analysis was applied using statistical software Stata v. 9.

Methods

Sample of 51 persons with different degree of overweight, including 7 men and 44 women, was for the first time investigated as a part of the project in period 2006-2007.

In all monitored persons entry investigation was conducted at the Department of physiotherapy, Vitkovice Hospital, including information on case history (personal, family), basic clinical investigation, biochemical investigation, information on physical activity and food habits. Information on physical activity and food habits from case history were completed with information on determination of energetic intake on the base of 4 days record of food intake and determination of energetic output based on the monitoring of physical activity. As a part of anthropometric investigation the basic anthropometric data were collected including: height, weight, circumference of waist (waist1 -between the 12th rib and crista illiaca, waist2 - on the level of navel) and selected transverse and circumferential dimensions required for determination of weight composition of scelet, muscles and fat tissue using method by Matiegka, BMI, percentage of fat determined by caliperation, determination of percentage of fat using bio-electric impedance, determination of abdominal fat using CT, investigation of composition of human body using a method of dual rtg absorpciometry (DXA). Investigation of both hormones adiponectin and insulin was also conducted. In all persons basic metabolism and fitness was investigated by bicycling stress exercise test up to maximum values. A part of the intervention programme was a modification of diet regimen, exercise under the supervision of physiotherapist supplemented with verbal intervention and individual modification of physical regimen.

RESULTS

Sample

Total sample includes 51 persons. But only 13 persons including 3 men and 10 women were repeatedly examined after 6 months (first control examination) at the end of May 2007. Basic characteristics of sample includes table 1.

Table 1 Basic cahracteristics of sample (13 persons)

	Mean	standard deviation	Min.	Max.
Age	44.6	9.7	30	58
Hight [cm]	166.2	7.0	156.5	180.5
Weight – start [kg]	100.9	19.7	73.3	149.2
Weight – po 6 m. [kg]	94.3	17.5	67.6	134.7
% fat – start	34.2	3.9	27.9	41.1
% fat – after 6 months	31.0	7.8	16.8	43.4
BMI – start [kg/m ²]	36.4	5.6	29.5	48.4
BMI – after 6 months [kg/m ²]	34.1	5.4	27.0	44.0
Weight-shortage [kg]	6.6	6.2	2.9	14.7
% fat-shortage	3.2	5.0	2.3	12.7

Anthropometric data

Statistically significant decrease of total weight ($p = 0.001$), percentage of body fat ($p = 0.021$) and BMI ($p = 0.001$) was achieved by targeted intervention using modification of diet habits and physical regimen after 6 months of monitoring. Also statistically significant reduction of body size was detected after 6 months. (Figure 2).

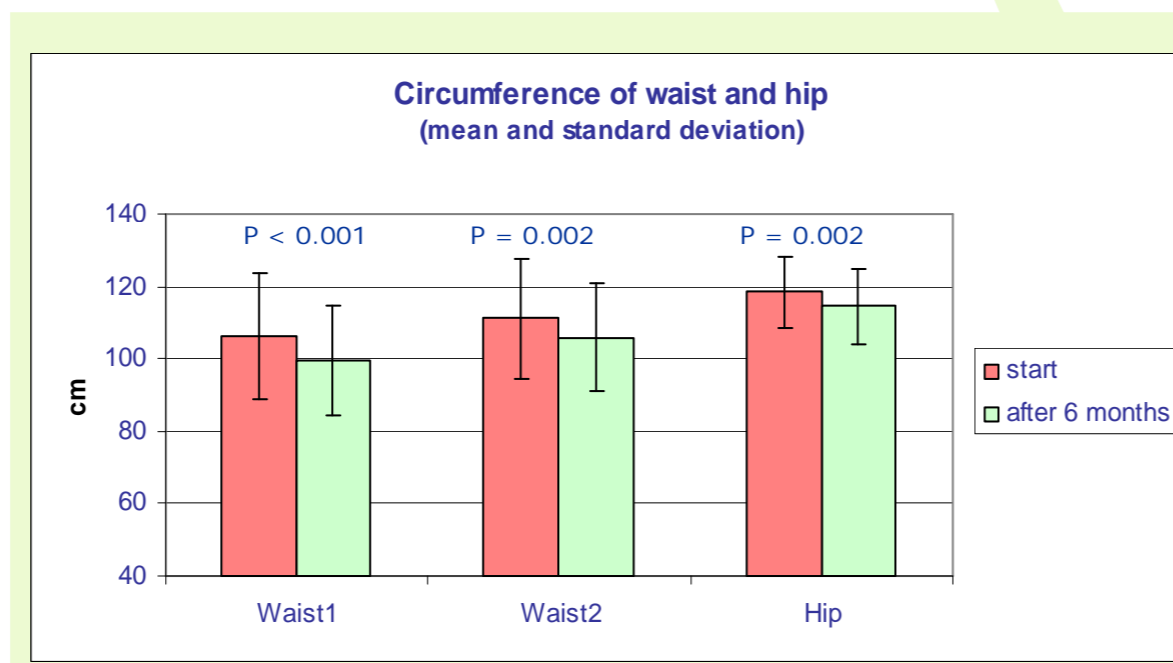


Figure 1 Circumference of waist and hip

Ergometric investigation

Total fitness was not changed but significant increase of performance and maximal consumption of oxygen in conversion to kilograms of body weight was achieved (Table 3).

Table 3 Ergometric investigation – selected parametrs

Indicator	Measurment	Mean	Standard Deviation	Min.	Max.	P
Wmax	start	171.15	36.58	100	225	0.109
	after 6 months	178.85	32.03	100	225	
Wmax/kg	start	1.72	0.29	1	2.1	0.004
	after 6 months	1.95	0.45	1	3	
VO ₂ max	start	2.17	0.52	1.39	3.13	0.606
	after 6 months	2.14	0.40	1.4	2.88	
VO ₂ max/kg	start	21.64	4.07	14	29.9	0.061
	After 6 months	23.07	4.03	13.7	30.2	



Figure 2 Bicycle ergometer

Biochemical investigation

Values of first investigation and control investigation after 6 months is included in table 2. After 6 months the values of glycemia, total cholesterol, HDL, C-peptide and triiodtironine were statistically significantly improved, what comply with decrease of energetic daily intake published in literature. On the contrary statistically significant increase both for HDL level and HDL/cholesterol index was detected correlating with increased physical activity in a similar way as decrease of glucose. Particularly in women TSH was increased after implementation of physical regimen. For this dataset the results are not statistically significant and will be further followed up.

Table 2 Results of biochemical inetigations

Indicator	Investigation	mean	Standard deviation	Min.	Max.	P
Glycemia	start	5.41	0.80	4.2	6.5	0.046
	after 6 months	5.11	0.44	4.6	6.1	
Cholesterol	start	5.84	0.88	4.1	7.3	0.040
	after 6 months	5.45	1.10	3.8	7.2	
Triacylglycerol	start	1.68	0.62	0.91	2.74	0.087
	after 6 months	1.46	0.84	0.53	2.90	
HDL	start	1.33	0.28	1.01	1.89	0.002
	after 6 months	1.52	0.39	0.99	2.17	
LDL	start	3.92	0.84	1.97	5.21	0.132
	after 6 months	3.72	0.80	2.31	5.26	
C-peptide	start	1088	422	533	2154	0.013
	after 6 months	933	384	526	2049	
Triiodtironine	start	1.83	0.49	1.02	2.91	0.014
	after 6 months	1.54	0.34	0.70	2.23	
T4 - free	start	16.00	1.62	13.4	18.8	0.283
	after 6 months	15.58	1.73	11.6	18.3	
TSH	start	1.92	0.58	0.71	2.61	0.108
	after 6 months	2.84	2.51	0.82	8.97	
Index HDL/Chol	start	0.23	0.06	0.16	0.36	0.002
	after 6 months	0.28	0.06	0.20	0.41	

Conclusion

- Statistically significant decrease of total weight, percentage of body fat and BMI by targeted intervention using modification of diet habits and physical regimen was achieved after 6 months of monitoring.
- Biochemical indicators - glycemia, total cholesterol, HDL, C-peptide and triiodtironine were improved after 6 months.
- Total fitness was not changed but significant increase of performance and maximal consumption of oxygen in conversion to kilograms of body weight was achieved.
- These results are preliminary. Each person has been followed 1 year (two control investigations).