

SPORTS ANTHROPOLOGICAL STUDY OF SOMATOTYOLOGICAL CHANGES IN OBESE PATIENTS DURING A TWO-WEEK INPATIENT REHABILITATION PROGRAM

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ABSTRACT

The aim of this exploratory study was to examine whether a two-week rehabilitation program (1800 kcal/d, 3×30 min gymnastics, 3×30 min water aerobics and 5×30 min ergometer training per week) is sufficient to register measurable somatotypological changes.

43 patients (26 men, 17 women) were examined (BMI span 25.7 kg/m² – 55.2 kg/m², the age range 19–73 years, the average height males 180.5 cm, females 167.2 cm, the average weight of men 116.7 kg, the average weight of women 97.8 kg).

After 2 weeks the men had lost 3.78 kg and the women had lost 1.86 kg on average.

The mean BMI of the men (women) was at the beginning 36.8 kg/m² (34.2 kg/m²), at the end 35.3 kg/m² (33.5 kg/m²).

In the chessboard graphics after Conrad a left shift from the hyperplastic pole to the hypoplastic pole can be seen. Compatible with this observation is the significant change in the plastic index for men. In the somatochart after Heath & Carter a slight shift of patients toward the center and toward the mesoendomorph sector after the treatment can be seen. The changes are statistically highly significant for the mesomorphy, the endomorphy and the ectomorphy.

Further studies in larger study cohorts and over longer periods, however, are needed to confirm these tendential changes.

Keywords: *somatotypes, obese patients, sports anthropology, inpatient rehabilitation*

INTRODUCTION

The aim of this exploratory study was to examine whether a two-week rehabilitation program is sufficient to register measurable somatotypological changes of obese patients. The two-week inpatient treatment consisted of a reduction diet (1800 kcal/d, 50% carbohydrates, 30% fat, 20% protein) and an exercise program (3×30 min gymnastics per week, 3×30 min water aerobics per week, 5×30 min ergometer training per week).

MATERIAL AND METHODS

In this study 43 patients (26 men and 17 women) of a rehabilitation clinic were examined (BMI span 25.7 kg/m² – 55.2 kg/m², the age range 19–73 years, the average height males 180.5 cm, females 167.2 cm, the average weight of men 116.7 kg, the average weight of women 97.8 kg).

All investigations took place at the same time.

In 7 male patients the hip-to-waist ratio was above 1.0. The hip-to-waist ratio of 15/17 women was above 0.85. The range of fat mass (body fat percentage) of men is 22.4 kg (26.1%) to 57.5 kg (42.9%). The range of fat mass (body fat percentage) of women is 17.9 kg (32.8%) to 54.7 kg (47.7%).

Each proband participated voluntarily and the data were used anonymously.

Anthropometric data and computed constitutional and somatotypical parameters in this work correspond to international standards [1, 2, 3, 4, 5, 6, 7].

RESULTS

After 2 weeks the men had lost 3.78 kg and the women had lost 1.86 kg on average.

The mean BMI of the men (women) was at the beginning 36.8 kg/m² (34.2 kg/m²), at the end 35.3 kg/m² (33.5 kg/m²).

The changes of the distribution of the constitutional types after Conrad [1] and the somatotypes after Heath & Carter [1, 3] are summarized in Figures 1–2.

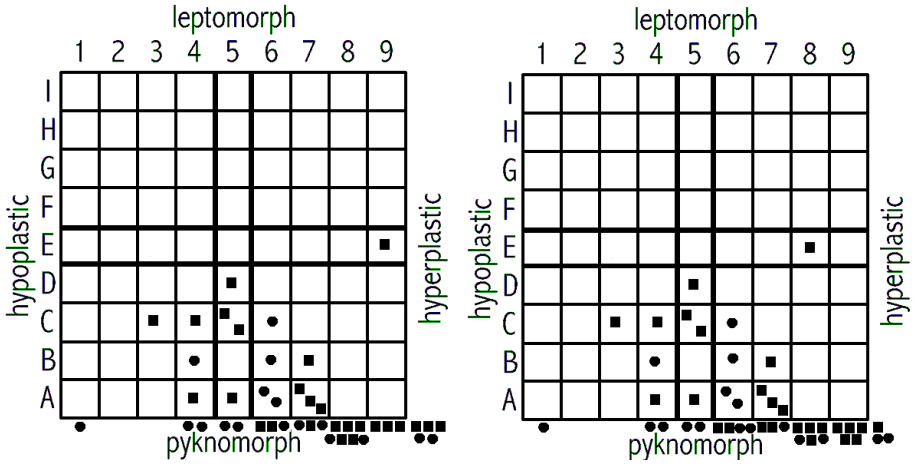


Figure 1. Male (squares; n=26) and female (circles; n=17) patients in the chessboard pattern graphic after Conrad [1], the comparison between initial (left graphic) and final examination (right graphic) after a two-week inpatient rehabilitation program for obese patients.

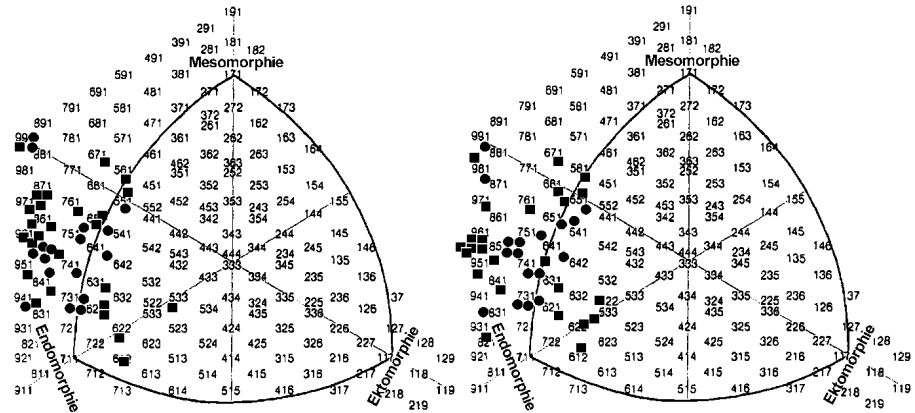


Figure 2. Male (squares; n=26) and female (circles; n=17) patients in the somatochart after Heath and Carter [2, 3], the comparison between initial (left somatochart) and final examination (right somatochart) after a two-week inpatient rehabilitation program for obese patients.

The positive influence of the combined rehabilitation program of reduction diet and exercise can also be seen from the following table.

Table 1. Mean differences of selected anthropometric and somatotypical parameters between the initial and the final examination after a two-week inpatient rehabilitation program for obese patients (n= 43), t-test

Parameter	Mean difference	t-test	p
Weight (kg)	3.0	9.0	≤ 0.01
Skinfolds sum (mm)	8.5	10.9	≤ 0.01
Waist circumference (cm)	1.6	7.3	≤ 0.01
Hip circumference (cm)	2.1	6.5	≤ 0.01
Body fat mass (kg)	1.2	10.2	≤ 0.01
Plastik Index (men)	0.4	2.5	≤ 0.05
Plastik Index (women)	0.1	1.6	n.s.
Mesomorphy	0.18	9.7	≤ 0.01
Endomorphy	0.12	4.4	≤ 0.01
Ectomorphy	-0.06	3.9	≤ 0.01
AKS-Index (men)	0.05	6.0	≤ 0.01
AKS-Index (women)	0.03	4.3	≤ 0.01

DISCUSSION

Remarkably, one finds already under a two-week rehabilitation period with sports and reduction diet measurable changes in the somatochart and the constitutional type graphic according to Conrad.

In the chessboard graphics after Conrad [1] a left shift from the hyperplastic pole to the hypoplastic pole can be seen. Compatible with this observation is the significant change in the plastic index for men.

In the somatochart after Heath & Carter [2, 3] a slight shift of patients toward the center and toward the mesoendomorphic sector after the treatment can be seen. The changes are statistically very significant for the mesomorphy, the endomorphy and the ectomorphy.

The mean AKS index of the women (men) ranked initially at 1.36 (1.5), recently at 1.33 (1.44).

The changes were each statistically highly significant. Further studies in larger study cohorts and over longer periods, however, are needed to confirm these tendential changes.

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