THE REDUCTION OF WEIGHT TROUGH RESTRICTIVE DIET AT OVERWEIGHT FEMALE WITH POLYCYSTIC OVARY SYNDROME COMPARED TO THE OVERWEIGHT FEMALE WITHOUT POLYCYSTIC OVARY SYNDROME

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Abstract

Polycystic ovary syndrome is the most frequent endocrinopathy in reproductive-aged women. The classic symptoms include hirsutism, acnea, overweight, oligo or amenorrhea, infertility. We have compared the effect of the restrictive diet in weight at 10 overweight female with PCOS and 10 overweight female without PCOS and without diabetes mellitus. The female without PCOS lost 6.1 kg in average after 3 months, while the patients with PCOS lost only 3.9 kilograms in average. The effect of the caloric restrain as an unique therapeutic measure is more reduced at the patients with PCOS in contrast with the patients without PCOS. This could presume the existence of a kind of resistance upon loosing weight at the patients with PCOS.

key words*: polycystic ovary syndrome, diet, overweight, insulin resistance*

Background

Polycystic ovary syndrome (PCOS) is the most frequent endocrinopathy in reproductive-aged women, mainly characterized by oligoanovulation and hyperandrogenism [1]. Features of PCOS may manifest at any age. Interest in PCOS has increased recently with the realization that this syndrome involves far more than the reproductive system. The pathogenesis of PCOS is poorly understood, but the primary defect may be insulin resistance leading to hyperinsulinemia. In the ovary, the cardinal feature is functional hyperandrogenism [2]. Most women with PCOS are overweight or obese, further enhancing androgen secretion while impairing metabolism and reproductive functions and possibly favoring the development of the PCOS phenotype [3]. Insulin resistance and compensatory hyperinsulinemia have implications both for ovarian function (amplifying androgen excess and inhibiting ovulation) and for long-term health. Clearly women with these metabolic abnormalities are at increased risk of developing impaired glucose tolerance and type 2 diabetes mellitus, and (probably) cardiovascular disease. Both metabolic and reproductive abnormalities are amplified by obesity and the treatment of first choice for overweight or obese women with PCOS is modification of diet and lifestyle [4].

Women and particularly obese women with insulin resistance and the polycystic ovary syndrome have an increased risk of developing gestational diabetes and also type 2 diabetes and cardiovascular disease in later life. The women should be counseled about long-term health risks, and obese women with the polycystic ovary syndrome should be periodically screened [5].

Material and method

The aim of our study was to evaluate the effect of the caloric restrain as unique therapeutic method on the corporal weight (W_c) at two groups of overweight female: one group of 10 overweight patients with PCOS and the second group of 10 overweight female without PCOS. PCOS was diagnosed according to the Rotterdam criteria: clinical or metabolic hyperandrogenism, oligo or anovulation, the sonographic criteria of polycystic ovary (ovarian volume over 10 ml or the existence of more than 12 follicles on each section) [6, 7]. We excluded from our study patients with any kind of abnormal glucose metabolism, with dyslipidemia or with abnormal blood pressure.

We applied to each patient a questionnaire in order to observe the meal schedules, the favorite food and ways of cooking. Anthropometric measures (height, waist circumference (WC), W_c) were made and was calculated the body mass index (BMI). The caloric necessary was calculated based on the Harris-Benedict formula regarding the basal metabolism [the rate of the basal metabolism (RBM) = 655 + (9.6 X W_c in kg) + (1.8 X height in cm) – (4.7 X age in years)] and the daily energetic consumption for each patient [8].

Table 1. Characteristics of the two groups of overweight patients

	Patients without PCOS	Patients with PCOS	p
Number	10	10	NS
Age (years)	29±5.91	28.2±5.29	NS
Initial W_c (kg)	79,4±7,06	72.95±6.396	NS
Initial WC (cm)	88±2,75	90.6±3.27	NS
Initial BMI (kg/m^2)	27.09±1.578	26.9±1.846	NS

These data are means ± SD. p was calculated with unpaired Student's t test.

At the beginning, the group of the female without PCOS had an average W_c of 79.4±7.06 kg, an average WC of 88±2, 75 cm and an average BMI of 27.09±1.578 kg/m^2, while the patients with PCOS had an average W_c of 72.9±6.3 kg, an average WC of 90.6±3.27 cm and an average BMI of 26.9±1.846 kg/m^2 (table 1). There were no statistically differences between the two groups regarding the age, initial W_c, initial WC and initial BMI.

Both groups were advised to have a balanced hypocaloric diet with a 600 kcal restriction in contrast with the ideal caloric necessary. This diet was carried on for three months. After this period the patients have been reevaluated, weighed and the BMI has been recalculated [9, 10].

Results

The female without PCOS lost in average 6.1±1.52 kg, in contrast with the patients with PCOS who lost, on average, only 3.91±1.52 kg.

30% of the female without PCOS were still overweight, while 40% of the patients with PCOS maintained their BMI over 25 kg/m^2.There are no important differences between the two groups regarding W_c after 3 months and BMI after 3 months. There are very statistical significant differences regarding WC after 3 months, ΔW_c, ΔWC and ΔBMI (table 2). (ΔW_c = initialW_c - W_c after 3 months; ΔWC = initial WC – WC after 3 months; ΔBMI = initial BMI – BMI after 3 months).

Table 2. The comparison of the parameters at the two groups

	Patients without PCOS	Patients with PCOS	p
Number	10	10	NS
W_c after 3 months (kg)	68.8±7.239	69.05±6.211	NS
WC after 3 months (cm)	84.8±2.82	88.8±2.97	0.0064
BMI after 3 months (kg/m^2)	24.89±1.648	25.49±1.77	NS
ΔW_c (kg)	6.1±1.52	3.9±1.52	0.0047
ΔWC (cm)	3.2±1.14	1.8±0.79	0.0049
ΔBMI (kg/m^2)	2.2±0.581	1.41±0.559	0.0062

These data are means ± SD. p was calculated with unpaired Student's t test.

The analyzed data reveal the fact that the female without PCOS had a considerable weight loss, compared to the patients with PCOS, so statistically the average weight loss at the female without PCOS was significantly higher compared to the ones with PCOS.

Discussions

After 3 months of the caloric restrain the two groups remained similarly as W_c and BMI, but it occurred a significant difference between them regarding WC. The loss of weight through caloric restriction is produced slower and more difficult at the patients with PCOS than those without PCOS. This phenomenon could be connected to a factor associated to PCOS that prevent the loss of weight. It is known that the hormonal modifications which characterize PCOS are associated with IR and the difference between the two groups regarding WC occurred after the caloric restrain may be considered a proof of the implication of IR in preventing the weight lost.

If IR would be the factor that impede the weight loss at the patients with PCOS, than the insulin-sensitizing agents of the biguanides class (metformin) might facilitate the rate of weight loss at these patients. We consider that more studies on larger groups of patients are necessary in order to conclude correctly.

Conclusions

Initially the two groups of patients are similar as age and anthropometric measures. The application of the identical caloric restrain determined the loss of the W_c and, implicitly, a lower BMI. The statistically significant differences between the two groups are the number of kg and cm in WC lost and the reduction of BMI in the same period of time. There is a variable we tried to control as much as possible by weekly investigations (the compliance of the patients to the diet). The study included persons who asked for a prescription for slimming diet, so they were determined enough in this matter. If this variable is neglected, then the difference between the two groups is determined by the presence of the PCOS. The significant

difference regarding WC after 3 months between the two groups determinated us to assume that the IR from PCOS might impede the loss of weight. It could be useful to observe the effect of the insulin-sensitizing agents of the biguanides class on this parameter. Another conclusion of this study is that „we are not equal before the calory" even if „the calory is the same for everybody", because the human body does not work according to the strict laws of mathematics.

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