

Somatotype traits of women suffering from cancer of the endometrium

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Introduction. Epidemiological observations indicate that certain anthropometric traits of female body build may constitute heightened risk factors for the development of uterine corpus endometrial carcinoma.

Materials and methods. 97 subsequent patients with histologically confirmed carcinoma of the uterine corpus in FIGO stage I-III (median age – 61 yrs) were studied. Each patient was weighed on electronic scales, and underwent sixteen anthropometric measurements. Structural corpulence and overall fat deposition were evaluated with the body mass index (BMI), and fatty tissue distribution with the waist/hip ratio (WHR index).

Results and discussion. The studied patients were characterized by corpulent body build, slightly greater body height, symptomatically higher body mass and androidal fat deposition type. They could be classified as brachycephalic, with broad and medium high faces. Additionally, they were characterized by short trunk, wide shoulders and pelvises, medium length upper extremities, short lower extremities, convex chest and acromioliac proportions of female type. Generally, they had average body height ($x=156.2$ cm) and high body mass ($x=74.4$ kg), were reflected in the value of the BMI (30.6), qualifying them as obese.

Conclusion. The examined group of women was characterized by only slightly higher than average body height, and significantly higher body weight as compared to the general population of Lower Silesia. This results in a considerable increase of BMI and WHR indices in this group.

Cechy somatotypu kobiet chorych na raka endometrium

Wprowadzenie. Obserwacje epidemiologiczne wskazują, że niektóre cechy budowy ciała kobiet mogą wiązać się ze zwiększonym ryzykiem wystąpienia raka endometrium.

Materiał i metoda. Badania przeprowadzono u 97 kolejnych chorych, leczonych z powodu potwierdzonego histopatologicznie raka endometrium w st. I-III wg FIGO (średni wiek chorych 61 lat). Wszystkie pacjentki ważono na wadze elektronicznej i wykonano u nich siedemnaście pomiarów antropometrycznych. Całkowitą zawartość tkanki tłuszczowej oceniano wsk. BMI, zaś rodzaj jej dystrybucji – wsk. WHR.

Wyniki i dyskusja. Chore objęte badaniem charakteryzowały się korpulentną budową ciała, nieco wyższym od populacji zdrowej wzrostem i wyraźnie większą masą ciała oraz androidalnym typem dystrybucji tkanki tłuszczowej. Badane kobiety, z punktu widzenia antropologicznego, opisano jako krótkogłowe, o szerokiej i umiarkowanie wysokiej twarzy. Ponadto cechowały się krótkim tułowiem, szerokimi barkami i miednicą, umiarkowanie długimi kończynami górnymi i krótkimi kończynami dolnymi, a także wypukłą klatką piersiową i żeńskim typem proporcji barków do bioder. Generalnie kobiety chore na raka endometrium charakteryzowały się średnim wzrostem i dużą masą ciała, co odzwierciedlało się w wysokiej wartości BMI, kwalifikującej je do kobiet otyłych.

Podsumowanie. Porównanie z populacją dolnośląską wskazuje, że badane kobiety różniły się od niej nieznacznie wyższym wzrostem, jednak cechowały się istotnie większą masą ciała, co uwidaczniało się w znaczącym wzroście wskaźników BMI i WHR.

Key words: endometrial cancer, somatotype, anthropometric traits

Słowa kluczowe: rak endometrium, somatotyp

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Introduction

There is more and more evidence that some constitutional traits of humans, including excessive body mass, increase the risk of incidence of certain malignancies. In particular this concerns tumours of the kidney, the endometrium, the colon, the prostate and the gall bladder, as well as breast tumors in postmenopausal women. It is assumed that increased weight is responsible for the incidence of 5% of all malignancies noted in the European Union, corresponding to 27 000 cases in men and 45 000 cases in women *per annum*. The highest percentage is observed in case of endometrial carcinoma (39%), kidney (25% in both sexes) and gall bladder (25% in men and 24% in women). The highest number of cases related to obesity concerns malignant neoplasms of colon (21500 cases *per annum*), endometrium (14000 cases *per annum*) and breast (12800 cases *per annum*). Epidemiological studies indicate that if the occurrence of overweightness and obesity among the inhabitants of the European Union would reduce by half the incidence of malignancies would decrease by some 36000 cases *per annum* [1, 2].

Epidemiological observations have, for many years, been indicating that certain anthropometrical traits of female body build (overweight and obesity), resulting from excessive supply of calories and insufficient physical activity as well as predisposition to some related diseases (e.g. arterial hypertension and diabetes) may constitute a increased risk factors of the development of uterine corpus endometrial carcinoma. It remains disputable whether secondary factors, such as hypertension and diabetes, constitute an independent risk factor or whether they increase the risk of endometrial malignancy only in women with excessive body mass [3-6].

Aim, material and methods

The aim of this analysis is to describe a set of selected somatotype traits of women treated for endometrial carcinoma. The material consisted of 97 subsequent patients with histologically confirmed carcinoma of uterine corpus in stages I-III according to the FIGO classification, admitted for treatment in the Oncological Gynecology Clinic of the Wrocław Medical University, in 1998 and 1999. Patient age ranged from 41 to 77 years (median – 61 yrs); 20/97 (20.6%) premenopausal, 77/97 (79.4%) – postmenopausal.

After admittance the patients gave detailed medical history and completed a questionnaire concerning professional experience, social conditions and lifestyle, the use of stimulants. They also underwent a detailed analysis of hormonal and lipid metabolism parameters (the case history data and laboratory-test results are the subject of separate studies).

Each patient was weighed on electronic scales, and had seven head diameters taken: length (*g-op*) and width (*eu-eu*) of the head, length (*n-gn*) and width (*zy-zy*) of the face as well as height (*n-sn*) and breadth (*al-al*) of

the nose. Besides, eight other anthropometric measures resulting from nine performed measurements were determined: total body height (*B-v*), shoulder width (*a-a*), width (*tl-tl*) and depth (*xi-ts*) of the chest, adsternal height (*B-ssst*), iliac width (*ic-ic*) and lower (*B-sy*) as well as upper extremity length – the latter as the difference between the adacromial height (*B-a*) and that up to the third hand phalanx (*B-daIII*). The following circumferences were also measured: chest, waist, thigh, arm, forearm, hips and of hips through trochanters. Skinfolts were measured with a skin-fold caliper in three locations: on the umbilical level of the abdominal wall, on the subscapular area of the back and over the triceps muscle on the arm. The somatotype and overall fat deposition were evaluated with the BMI index, while fatty tissue distribution with the WHR index.

We used standard anthropological instruments for the measurements [7]: Martin's anthropometer, large and small spreading calipers, sliding calipers, a skin-fold caliper and a plastic measuring tape. The obtained results were subject to statistic analysis, determining – for respective measurements – the values of: arithmetic means, medians, standard deviations as well as values of the 25 and 75 percentiles.

Results and discussion

The analysis of results obtained in this investigation (Table I) allowed to reveal certain specific somatic traits of women suffering from endometrial carcinoma.

The women with diagnosed uterine corpus carcinoma were characterized by:

1. Generally corpulent body build – BMI = 30.6, Rohrer index = 1.95, Škerlj's corpulence index = 36.67.
2. Slightly greater body height than that of their healthy peers (about 1-2 cm).
3. Considerably higher body mass (over 10 kg).
4. Androidal fat deposition type (WHR index = 0.82).

Basing on the craniometric indices [10], the examined women were classified as: brachycephalic (main head index = 85.08); broad-faced (zygomatico-mandibular index = 81.64); with medium high faces (morphological face index = 84.29); with medium nose index = 72.26.

While evaluating the selected somatometric indices of the postcranial traits in the examined women, one may assume that these women are characterized by: short trunk (index = 32.43), broad shoulders (index = 23.5), broad pelvises (index = 20.9), medium-long upper extremities (index = 45.4), short lower extremities (index = 49.4), convex chest (index = 76.8), shoulder-hip proportions of female type (index = 88.9).

Basing on the analysis of obtained data it can be assumed that the examined women were characterized by an average body height ($x = 156.2$ cm) and high body mass ($x = 74.4$ kg), reflected by the value of BMI index (30.6) and qualifying them to the group of obese individuals.

Table I. Anthropometrical traits of women suffering from endometrial cancer

Traits	Min	Max	\bar{X} (mm)	SD	Me	C ₂₅	C ₇₅
G-OP	170.0	200.0	180.7	5.4	181.0	177.0	184.0
EU-EU	142.0	167.0	154.4	4.8	154.0	151.0	157.0
ZY-ZY	110.0	148.0	128.6	7.0	129.0	123.0	133.0
GO-GO	91.0	125.0	105.0	6.2	105.0	101.0	109.0
N-GN	91.0	121.0	108.4	5.8	109.0	104.0	112.0
N-SN	39.0	55.0	47.6	3.5	47.0	45.0	50.0
AL-AL	27.0	41.0	34.4	2.8	35.0	32.0	36.0
A-A	330.0	403.0	367.3	16.5	366.0	355.0	380.0
TL-TL	228.0	380.0	288.6	26.6	290.0	272.0	300.0
IC-IC	270.0	395.0	326.7	24.4	325.0	310.0	340.0
XI-TS	160.0	280.0	221.7	24.8	221.0	205.0	240.0
B-V	1440.0	1754.0	1562.4	59.4	1560.0	1515.0	1610.0
B-SST	1163.0	1448.0	1279.5	51.8	1281.0	1241.0	1318.0
B-A	1161.0	1433.0	1278.1	52.9	1283.0	1238.0	1320.0
B-DA3	487.0	780.0	601.7	41.6	603.0	575.0	626.0
B-SY	635.0	900.0	772.8	58.1	775.0	722.0	818.0
WEIGHT (kg)	51.5	116.5	74.4	12.1	74.3	66.0	80.6
CIRCUMFERENCE (mm)							
CHEST	64.0	128.0	93.8	11.5	94.0	86.0	102.0
WAIST	67.0	137.0	97.7	13.6	100.0	88.0	106.0
THIGH	46.0	73.0	57.3	5.4	57.0	53.5	61.0
UPPER ARM	25.5	44.00	33.5	3.7	33.0	31.0	35.5
FOREARM	21.5	32.0	26.3	2.0	26.0	25.0	27.5
HIPS	94.0	164.0	118.1	12.2	120.0	108.0	125.0
HIP- TROCH.	90.0	197.0	106.5	13.7	103.0	98.0	111.0
SKINFOLDS (mm)							
ABDOMEN	0.8	7.5	4.4	1.4	4.4	3.5	5.5
SUBSCAPULAR	0.8	9.5	3.1	1.3	2.8	2.2	3.8
OVER TRICEPS	0.8	3.3	1.8	0.6	1.7	1.3	2.1
INDEX							
BMI	20.8	49.8	30.6	5.5	30.5	26.9	33.4
WHR	0.74	1.06	0.83	0.06	0.83	0.77	0.86

A comparison with data concerning the Lower Silesian population [8] – Table II – indicates that, even though the examined group of women was characterized by only a slightly higher than average body height, their body mass was significantly higher, which resulted in a considerable increase of BMI and WHR indices in this group.

This is confirmed by observations of American scientists indicating univocally, that the risk of uterine corpus carcinoma occurrence is four times higher in women classified as the fourth quartile of body mass index value (BMI), than in women classified as the lowest quartile [9]. It must be stressed that the lower limit of the fourth quartile of BMI value in women subject to this

Table II. Comparison of selected traits in diseased and healthy women

	Bergman, Nakonieczna [8]		Michałkiewicz [18]		Author's research	
Age N	57-88	N=76	61-65	N=25	41-77	N=97
	X	SD	X	SD	X	SD
Body height [cm]	155.2	5.002	154.0	7.4	156.2	5.9
Body mass [kg]	65.5	9.698	62.3	10.82	74.4	12.1
BMI	27.2	3.831	25.2	4.1	30.6	5.5
WHR	0.82	0.06	0.81	0.06	0.82	0.06

examination (33.4) decidedly indicated a high degree of obesity.

However, another study based on body mass evaluation, circumferences and thickness of fatty folds demonstrated that in physically active women there is only a slight decrease of the risk of uterine corpus carcinoma in comparison to those with passive lifestyle. Anamnestic data of women examined in the course of our study indicates that they have led a rather passive lifestyle.

Until now, no evident correlation between the diet and the risk of uterine corpus carcinoma occurrence has been found – also in relation to obesity, excess of calories and low energy expenditure. There are many reports in literature concerning the beneficial preventive-therapeutic effects of a diet rich in grain, vegetables and fruits [10-19]. We did not interview our patients regarding dietary habits, therefore we do not know if they differ from a diet typical for the Polish society.

Endometrial carcinoma with its increase in occurrence is regarded – perhaps with some but only slight exaggeration – as a contemporary civilization disease of women, related to improved standards of living. In view of this it is interesting to note that the malignancy appears independently of limiting the amount of consumed fats, and intensifying physical activity, i.e. independently of factors which positively influence the lipid metabolism of the organism.

Some analyses based on the values of BMI indicate that the increased risk of uterine corpus carcinoma is related not only to overweight or obesity at the time of diagnosis, but also during previous decades of life – it is necessary to avoid obesity in the middle and older age in order to decrease the risk of the disease, but these benefits are even more pronounced in women who are already obese at an early age [20, 21]. However, not all authors have demonstrated the relationship between obesity at a young age and the occurrence of endometrial carcinoma in the later period of life [22].

The high value of the WHR index (0.82) in the studied patients provides proof of androidal fat deposition, which, in turn, relates to an increased risk of health problems [23]. This may confirm the opinions of other authors, who suggest that the risk of uterine corpus carcinoma is related rather to the distribution of fat tissue than to the very mass of this tissue or to general corpulence [13] – such relationships were observed in connection with neoplasm maturity [24]. It was also demonstrated that the plasma lipid level in patients with endometrial carcinoma is similar to that of healthy individuals and can be regarded as a factor increasing the risk of the disease incidence only in women over 55 years of age [25].

The presented analysis is an attempt at presenting the somatic structure of women suffering from uterine corpus carcinoma, which is perhaps related to the risk of the given disease occurrence, and thus the direction of genetic-population selection. It should be remembered, however, that there are numerous reports suggesting the

existence of relationships of this malignancy not only with constitutional traits of women but also with their lifestyle, the age of first childbirth, the number of children born, the length of the reproductive period or social and economic conditions [25]. An attempt at isolating these relationships of an extragenetic character shall be the subject of our further analyses.

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