

COMPARISON OF NUTRITION AND NUTRITIONAL STATUS OF OLDER WOMEN IN A TEN-YEAR PERIOD – PLENARY LECTURE

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The aim of this study was to compare the diet of older women examined in 1992 and in 2002. Comparing to 1992, in 2002, a statistically significant increase in calcium, potassium, folates, vitamin C and E content and a significant decrease in sodium content were observed. Despite these positive changes, in both studies the energy of diets and the contents of minerals (besides phosphorus and sodium), vitamins from group B and vitamin D was below the safe level of the Polish RDA

INTRODUCTION

A systematic increase in the average life expectancy in most of the countries, as well as in Poland, resulted in the increase of interest in the problem of aging. The rate of aging of an organism is an individual feature that depends on genetic predispositions, state of health and life style, *i.e.* diet, physical activity, sanitary conditions and culture level [Charzewska *et al.*, 2001]. It was found that both malnutrition and overfeeding have similar health results related to an increase of disease susceptibility and decrease of resistance and psycho-physical capacity, and consequently they result in shortening of life span. A proper diet reduces and even significantly decreases health problems. Changes in the Polish economic situation which started in 1989 have influenced diets in the subsequent years. Identification of directions of changes in diets of older people has contributed to the elaboration of more efficient programmes for the improvement of living standards and provision of help to this growing group of population.

The aim of this study was to compare changes in nutrition and nutritional status of elderly women examined in 1992 and in 2002.

MATERIALS AND METHODS

The study was carried out on a random sample of women living in two Warsaw districts. In 1992, 86 women aged 70 (response rate 86%) and in 2002 – 171 women aged 69-71 (response rate 49.6%) were examined.

Nutrition was assessed using 24-h recall method. Dietary nutrients' content was calculated using the computer programme "Diet 2" prepared on the basis of food composition tables [Kunachowicz *et al.*, 1998]. Nutrition was compared

with the safe level of the Polish RDA. BMI was calculated on the basis of the measurements of height and body mass [weight (kg)/body mass (m²)]. Frequency of obesity and low body mass were assessed with use of BMI according to WHO recommendations [WHO Technical Report, 1995]. The results obtained were verified statistically using the Student's t-test.

RESULTS

Both studies proved too large proportion of energy from protein and fat and too low from carbohydrates (Table 1). In diets of women who were examined in 2002, the proportion of energy from fat decreased by 1.9% comparing to the results from 1992 but still it was too large in comparison to recommendations. The recommended proportion of energy from fat in diets of older persons should not exceed 25% [Ziemlański, 1998].

Energy and contents of macronutrients in diets of women examined in 1992 and 2002 did not differ much. A decrease in cholesterol content (by 12%) and an increase in fibre content (by 12%) were recognized as a positive change in the study from 2002.

The contents of minerals and vitamins increased in diets of older women in 2002. The increase was statistically significant in respect of calcium, potassium, folates and vitamins C and E. At the same time, sodium content in diets decreased largely comparing to 1992.

In both studies, the energy intake in comparison with the safe level of the Polish RDA was too low (respectively 81.2% and 80.1%). Though in 2002, dietary contents of most of the analyzed nutrients increased, still the amount of miner-

TABLE 1. Energy and nutrients in women's diets.

Nutrients	Energy and nutrients in women's diets			
	year 1992 (n=86)		year 2002 (n=171)	
	$\bar{X} \pm SD$	% Polish RDA $\bar{X} \pm SD$	$\bar{X} \pm SD$	% Polish RDA $\bar{X} \pm SD$
Energy (kcal)	1431 ± 515	81.2 ± 29.0	1424 ± 560	80.1 ± 32.4
Protein total (g)	55.0 ± 21.9	108.0 ± 42.7	57.0 ± 24.4	110.0 ± 49.5
% Energy of protein	15.5		16.4	
Fat total (g)	54.6 ± 23.6	112.0 ± 48.6	51.6 ± 27.1	105.0 ± 56.2
% Energy from fat	33.6		31.7	
Cholesterol (mg)	200 ± 123		176 ± 120	
Carbohydrates (g)	192 ± 77		196 ± 79	
% Energy from carbohydrates	50.7		51.9	
Dietary fiber (g)	14.9 ± 7.1		16.7 ± 7.9	
Calcium (mg)	486.0 ± 17.8 •	48.6 ± 31.8 •	626.0 ± 385.0 •	62.6 ± 38.5 •
Phosphorus (mg)	887.0 ± 374.0	118.2 ± 49.9	972.0 ± 432.0	130.0 ± 57.6
Magnesium (mg)	216.0 ± 935.0	74.8 ± 36.4	237.0 ± 102.0	72.7 ± 33.9
Iron (mg)	9.0 ± 4.4	77.0 ± 33.1	8.7 ± 4.1	84.7 ± 36.7
Sodium (mg)	2764 ± 1453 *	481 ± 253 *	2408 ± 1134 *	419 ± 197 *
Potassium (mg)	2300.0 ± 981.0 •	65.7 ± 28.0 •	2815.0 ± 1201.0 •	80.4 ± 34.3 •
Vitamin B1 (mg)	0.86 ± 0.41	71.70 ± 34.30	0.88 ± 0.43	73.10 ± 35.80
Vitamin B2 (mg)	1.26 ± 0.67	70.10 ± 37.50	1.45 ± 0.81	80.40 ± 44.90
Vitamin B6 (mg)	1.25 ± 0.60	62.09 ± 30.2	1.40 ± 0.69	69.8 ± 34.5
Niacin (mg)	11.4 ± 5.8	71.4 ± 36.3	11.8 ± 6.5	73.8 ± 40.9
Folates (µg)	205.0 ± 84.7 *	64.1 ± 26.5 *	240.0 ± 118.0 *	75.1 ± 36.7 *
Vitamin C (mg)	108.0 ± 90.2 *	180.0 ± 150.0 *	136.0 ± 13.9 *	226.0 ± 190.0 *
Vitamin A (µg)	855 ± 1825	143 ± 304	1122 ± 3245	187 ± 541
Vitamin E (mg)	7.0 ± 3.8*	88.1 ± 47.2•	9.1 ± 6.4 *	114.0 ± 80.0 •
Vitamin D (µg)	2.32 ± 2.69	46.5 ± 53.9	1.94 ± 1.84	38.9 ± 36.8

* - Statistically significant difference, $p < 0.05$; • - Statistically significant difference, $p < 0.001$

als (besides sodium and phosphorus), vitamins from group B, folates and vitamin D was too low comparing to the safe level of Polish RDA. During 10 years between the two examinations compared in the study the covering of the safe level of Polish RDA for vitamin C and vitamin E increased statistically (by 45.8% and 25.5%, respectively), however the values of standard deviations reflect large variations of consumption inside the examined groups.

The nutritional status of women was assessed on the basis of anthropometric measurements. Women examined in 2002 were statistically significantly taller and weighed more than their peers in 1992 (Table 2). In both studies no deficiency in weight was noted in women ($BMI < 18.5$), and obesity ($BMI \geq 30$) rates were similar; in 1992 it was 36% and in 2002 – 36.8% (Figure 1). In 2002, the overweight frequency increased by 4.9% as compared to 1992.

DISCUSSION

All examinations carried out in Poland in respect of diets of older people show the presence of many irregularities which may have serious consequences for health. Irrespec-

tive of the energy of diets, the average percentage of energy from fat exceeded 30% in all examinations [Duda *et al.*, 2000; Gabrowska *et al.*, 2002; Kałuza *et al.*, 1999]. Thus, in

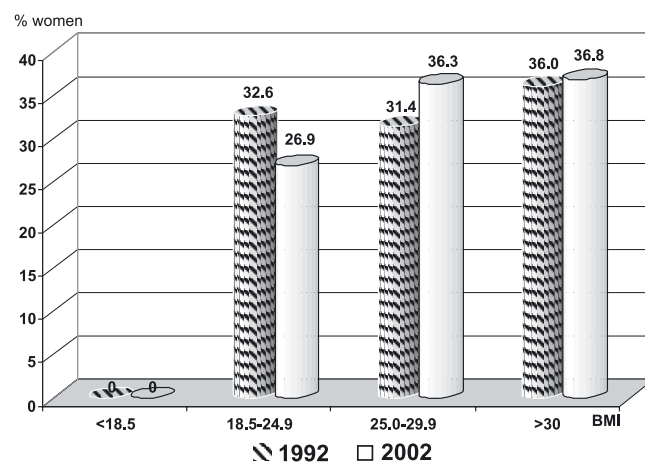


FIGURE 1. Distribution of BMI of the older women examined. Statistically significant difference between 1992 and 2002 was not observed.

TABLE 2. Anthropometrics measurements of the older women examined.

Parameter	Years of examination	
	1992 (n=86)	2002 (n=171)
	$\bar{X} \pm SD$	$\bar{X} \pm SD$
Body height (cm)	155.4 ± 5.6 *	157.4 ± 5.9 *
Body mass (kg)	67.9 ± 13.3 *	72.3 ± 13.5*
BMI (kg/m ²)	27.1 ± 3.7	28.8 ± 5.1

*- Statistically significant difference, $p < 0.05$

this study in both analyzed periods the percentage of energy from fat in women's diet was too large in comparison to recommendations.

In the period of ten years between the two studies, changes in nutrients in the diets of older women were noticed. A positive change was constituted by the decrease of cholesterol and sodium content in diets and the increase of fibre, folates and vitamin C and E content. Also the positive tendencies in nutrition of Warsaw residents were noticed by Waškiewicz who compared food consumption in 1984-2001 [Waškiewicz *et al.*, 2006]. According to the above mentioned researchers, the changes contributed to the decrease in death rate caused by cardiovascular diseases.

Despite these positive changes, the contents of calcium, magnesium and vitamin D in diets of older women were still too low (despite the increase in 2002) and the contents of phosphorus and sodium were too high, which might increase the risk of osteoporosis and consequently bone fractures [Chaupy *et al.*, 1992]. A low content of calcium (52-78% of recommended amounts) in diets of older women was shown in examinations carried out in Warsaw and Poznań regions [Kałuza *et al.*, 1999]. Deficiency of calcium and vitamin D contents occurred also in diets of 70-year-old women from Denmark and Ireland [Andersen *et al.*, 2005].

In 2002, an increase in overweight frequency (comparing to data from 1992) was noticed in the women examined, whereas the percentage of obese women was maintained. Among older persons from Poznań, overweight or obesity was found in 54% women and 72% men [Duda *et al.*, 2000] and among persons of 75-80 years of age from the Warsaw region the obesity occurred in 34% of women and 23% of men [Sicińska *et al.*, 2003]. Obesity is a recognized risk factor of cardiovascular diseases, diabetes, arterial hypertension, strokes, certain cancers and many other serious health problems which commonly occur in older people [Saidell, 1997]. The assessment of health condition in women examined in 1992 showed the occurrence of metabolic diseases related to obesity in a significant percentage of women [Ziemiański *et al.*, 1993].

CONCLUSION

Despite positive changes in diets of older women, in the last years still many irregularities were found.

It is necessary to promote a healthy lifestyle (especially principles of a healthy diet and increased physical activity) among

older people in order to delay the aging process, improve life quality of the seniors and prevent obesity development.

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**PORÓWNANIE SPOSOBU ŻYWIENIA I STANU ODŻYWIENIA STARSZYCH KOBIET
W OKRESIE 10 LAT – WYKŁAD PLENARNY**

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Celem pracy była ocena zmian w sposobie żywienia i stanie odżywienia starszych kobiet zbadanych w 1992 oraz w roku 2002. W 2002 roku w porównaniu z rokiem 1992 stwierdzono istotny statystycznie wzrost zawartości wapnia, potasu, folianów, witaminy C i E oraz istotny spadek zawartości sodu. Pomimo tych pozytywnych zmian w obu badaniach wartość energetyczna diet oraz zawartość składników mineralnych (oprócz fosforu i sodu) a także witamin z grupy B oraz witaminy D była niższa od norm na poziomie bezpiecznego spożycia.