

ASSESSMENT OF DIETARY CHOICES OF YOUNG WOMEN IN THE CONTEXTS OF HORMONAL CONTRACEPTIVES

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ABSTRACT

Background. Metabolic changes caused by hormonal contraception combined with unbalanced diet may pose many threats, and deficiency or excess of nutrients may increase the risk of using such contraceptives.

Objective. The purpose of the survey was to assess the dietary choices of young women using hormonal contraceptives, taking into account their general knowledge about the contraception and its impact on their bodies.

Material and methods. The survey comprised 67 women aged from 18 to 25 years. In of three-day menus (201 daily food rations) of the women under research the content of energy and most of nutritious ingredients wandered away from recommended values in Poland. Each respondent additionally filled in a questionnaire concerning her: anthropometric data, education, place of residence; the type, name and time of taking contraceptives; purpose for using hormonal contraception along with its determinants; duration of use, breaks in contraceptive practice; occurrence of side effects during contraceptive use; stimulants used; physical activity, incidence of diarrhoea and vomiting, and dietary supplements use.

Results. The assessment of nutritional status of young women taking hormonal contraceptives has shown a number of nonconformities. The survey has revealed insufficient energy value of the menus, and incorrect proportions of basic nutrients, from recommended values, what was reflected in insufficient intake of vitamins (A, D, E, C, B₁, B₃, B₆, and folates) and minerals (K, Ca, Mg, Fe). An excessive consumption of proteins, animal-based in particular, and insufficient consumption of lipids and carbohydrates, polysaccharides in particular, what resulted in insufficient consumption of dietary fibre.

Conclusions. Nutritional choices of the respondents were typical to their gender and age, but were not adjusted to the use of hormonal contraceptives. Side effects observed by the respondents, mainly weight gain, may have been a summary result of improper eating behaviors that facilitated accumulation of body fat and water.

Key words: *nutritional assessment, contraception, women health*

STRESZCZENIE

Wprowadzenie. Zachodzące przy stosowaniu antykoncepcji hormonalnej zmiany metaboliczne, w połączeniu ze źle zbilansowaną dietą, mogą nieść ze sobą wiele zagrożeń, a niedobór lub nadmiar składników odżywczych pogłębiać ryzyko stosowania tego rodzaju antykoncepcji.

Cel. Celem pracy była ocena sposobu żywienia oraz stanu odżywienia młodych kobiet stosujących antykoncepcję hormonalną, z uwzględnieniem poziomu ogólnej wiedzy na temat antykoncepcji i jej wpływu na organizm.

Materiał i metody. W badaniu udział wzięło 67 kobiet w wieku 18-25 lat. Obliczono wartość energetyczną i odżywczą trzydniowych jadłospisów (201 całodziennych racji pokarmowych), porównując je, po uwzględnieniu strat, z normą dla badanej grupy wiekowej, w stosunku do obowiązujących w Polsce zaleceń. Dodatkowo kobiety wypełniały ankietę zawierającą pytania o: wiek, wzrost, masę ciała, wykształcenie, miejsce zamieszkania; rodzaj, nazwę oraz godziny, w których respondentka przyjmuje środek antykoncepcyjny; cele stosowanej antykoncepcji hormonalnej oraz determinanty jej wyboru; długość okresu stosowania i przerwy w stosowaniu antykoncepcji; występowaniu skutków ubocznych w czasie stosowania antykoncepcji; stosowanych używkach (tytoń); aktywność fizyczną, dzienne spożyciu wody, częstotliwość występowania biegunek i wymiotów oraz stosowanie suplementów diety.

Wyniki. Uzyskane wyniki badań dotyczące oceny sposobu żywienia oraz stanu odżywienia badanych kobiet wykazały wiele nieprawidłowości w stosunku do obowiązujących zaleceń [5]. Stwierdzono zbyt niską wartość energetyczną diety oraz niewłaściwe proporcje w spożyciu podstawowych składników odżywczych co znalazło swoje odbicie w niewystarczającym spożyciu witamin (A, D, E, C, B₁, B₃, B₆, folianów) i składników mineralnych (potas, wapń, magnez, żelazo). Stwierdzono nadmierne spożycie białka, szczególnie zwierzęcego oraz niewystarczające lipidów. W ocenianych jadłospisach brakowało także węglowodanów, szczególnie złożonych, niewystarczające było też spożycie błonnika pokarmowego.

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Wnioski. Sposób żywienia badanych kobiet był typowy dla płci i wieku, ale nie uwzględniał faktu stosowania przez nie hormonalnej antykoncepcji. Zgłaszane przez kobiety objawy uboczne w postaci przyrostu masy ciała mogły być wynikiem sumy nieprawidłowych zachowań żywieniowych sprzyjających gromadzeniu w organizmie tkanki tłuszczowej i wody.

Słowa kluczowe: ocena sposobu żywienia, antykoncepcja, zdrowie kobiet

INTRODUCTION

In developed countries, hormonal contraception is second, after condom, the most popular birth control method. Additionally, it is one of the most effective contraceptive methods. It is based on taking a single sex hormone or a combination of several sex hormones which stop ovulation and induce changes in the female reproductive organ that inhibit sperm capacitation and prevent sperm movement to the place where an oocyte would be fertilized.

Sex hormones used in hormonal contraception, except for their specific biological activity, are involved also in particular metabolic activities, therefore using hormonal contraception may result in undesirable effects.

In the scientific debate on adverse effects of hormonal contraceptives, the main emphasis is being put on the risk of cardiovascular diseases [18], while female patients are mainly worried about the following: weight gain, skin condition, and the risk of malignant disease [8]. Contraceptives are used for medical treatment as well. Many women decide to use hormonal contraceptives to stop or reduce excessive hair growth, acne, or menstrual cycle-related pain [17].

In the said context, the problem of dietary habits and nutritional status of women unwilling to have children at the moment seems to be of lesser importance. The lack of data in the available literature confirms this thesis. But such a decision is not final, and taken hormones exert indeed an impact on the body. Metabolic changes caused by hormonal contraception combined with unbalanced diet may pose many threats, and deficiency or excess of nutrients may result from using such contraceptives [6].

The purpose of the survey was to assess the dietary choices of young women using hormonal contraceptives, taking into account their general knowledge about the contraception and its impact on their bodies.

MATERIAL AND METHODS

The survey comprised 67 women aged from 18 to 25 years. At first, the women attended a relevant training, after which they were taking regular records of the time, type and quantity of food they had on three randomly chosen days of a week including one

weekend day. The size of portions was assessed with the use of an album of photographs of food products and dishes [19]. The menus were from the March-April period.

The evaluation of energy and nourishment values of the menus was made, based on a computer software "Dieta 5D", defining the consumption of ingredients during each day and an average consumption in the last three days in which loss of the nutritive value of products was taken into account and then compared with nutrition standards at the level of prescribed RDA consumption for this age and sex group [5]. The consumption of dietary fiber and cholesterol was referred to the recommended amount in obesity and other non-infectious diseases prevention (analogically >25 g and <300 mg) [5]. After taking into consideration the amount of waste in consumed groups the obtained values were compared with prescribed food rations [21]. The obtained results were subjected to analysis by Microsoft Office Excel 2007.

Each respondent additionally filled in a questionnaire concerning: age, height, weight, education, place of residence; the type, name and time of taking contraceptives; purpose for using hormonal contraception along with its determinants; duration of use, breaks in contraceptive practice; occurrence of side effects during contraceptive use; stimulants used (smoking); physical activity, daily intake of water, incidence of diarrhoea and vomiting, and dietary supplements use.

RESULTS

Survey data

Among 67 women participating in the survey, 86.6% had normal weight (BMI 18.5-24.9), 7.5% were underweight (BMI <18.5), and 6% were overweight (BMI ≥25); 80% had higher education, 20% had secondary education; 65% lived in a city (above 100 thousand inhabitants), 14% in a medium-sized town (20 to 100 thousand inhabitants), 10% in a small town (up to 20 thousand inhabitants), and 11% in a rural area.

The women used the following contraceptives: pills - 69%, patches - 20%, vaginal ring - 10%, intrauterine device (IUD) - 1%.

The choice of a contraceptive was determined by the following criteria: price - 30%, convenient use - 37%, availability in pharmacies - 4%, effectiveness of the method - 41%, impact on health, well-being-

35%, doctor's order - 43%, doctor's assistance and suggestions - 18%. Only 11% admitted to follow the opinion of their environment when choosing a contraceptive, 50% - do not follow, 32% - sometimes, and 7% - never.

The main reason behind the use of contraceptives was birth control (83%), but also treating acne (13%),

irregular cycles (11%), heavy menstrual bleeding (6%), and excessive hair growth (4%).

Only 47% of respondents admitted they knew how hormonal contraceptives work, 51% knew "more or less" as they called it, and 2% knew nothing about the issue. The knowledge how hormonal contraceptives work was assessed on the basis of responses shown in Table 1.

Table 1. The assessment of knowledge of the indications and contraindications for the use hormonal contraceptives by women aged 18-25, n=67

| No. | Question | Yes (%) | No (%) |
|-----|--|---------|--------|
| 1. | Should you avoid smoking when using hormonal contraceptives? | 78 | 22 |
| 2. | Should you avoid any exposure to artificial UV radiation (e.g. not using solarium) when taking hormonal contraceptives? | 57 | 43 |
| 3. | Should hormonal contraceptives be avoided during pregnancy? | 83 | 17 |
| 4. | Is it possible that when you stop using hormonal contraceptives, fluctuations in menstrual cycles may last a few months? | 85 | 15 |
| 5. | Do hormonal contraceptives cause early miscarriage? | 50 | 50 |
| 6. | May hormonal contraceptives cause thrombosis? | 85 | 15 |
| 7. | Aren't there any contraindications to use hormonal contraceptives by female diabetics? | 20 | 80 |
| 8. | May increased blood cholesterol, blood triglycerides, or increased blood pressure disqualify a woman from using hormonal contraceptives? | 80 | 20 |
| 9. | Does the use of hormonal contraceptives increase the risk of breast cancer in women? | 52 | 48 |

A majority of the surveyed women, namely 57% have been using contraceptives without any breaks, 43% made breaks longer than a week, including one-month break (28%), 2 to 3-month break (30%), and longer ones (42%).

The respondents used hormonal contraceptives for: six months (8%), 1 to 2 years (42%), 2 to 3 years (24%) and over 5 years (26%).

According to the respondents, the side effects were observed in 43% of them. The most common side effects were as follows: weight gain, depression, mood changes, migraines, headaches, low libido, spotting, varices, nausea, vomiting. When using transdermal contraception, 5 women (7.4%) experienced a rash under the patch.

Weight gain was observed in 32% of respondents, of which 49% had gained 3 to 4 kg, 45% - 5 to 6 kg, and 6% - 10 kg. Some 14% of respondents were addicted cigarette smokers.

Although such a high percentage of women observed side effects of birth control, only 3% were taking protective dietary supplements, other dietary supplements, vitamins and minerals were taken by 32% of the women.

The daily water intake declared by respondents was as follows: 0.5 l - 1 l in 38%, 1.5 l in 52%, 2 l in 8%, 2.5 l in 2%.

The respondents rated their physical activity as: high - 2%, good - 24%, moderate - 59%, low - 8%, very low - 8%.

Number and times of meals

The respondents described their diet, used in three randomly chosen days of a week, as typical for their dietary habits. Among 67 women using hormonal contraceptives no less than 76% declared having 4 to 5 meals a day (in compliance with the principles of rational nutrition), 21% had 3 meals a day, 2% - 2 meals a day, 1% - 6 meals and more. According to the respondents, the most frequently skipped meal was an afternoon snack (Table 2). It seems, however, such a conviction resulted from the fact that fruit and snacks eaten in the afternoon were not considered as a meal.

Table 2. Percentages women eating basic meals in the term of interview, n=201 menus

| Type of meals | Percentage |
|-----------------|------------|
| Breakfast | 97.0 |
| Lunch | 76.0 |
| Dinner | 92.0 |
| Afternoon snack | 32.0 |
| Supper | 89.0 |

The number and type of meals were usually proper, but the times of meals and time intervals between meals did not comply with the principles of rational nutrition. It has been found that only 12% of respondents had breakfast before leaving their homes and at recommended times, and as many as 45% had supper after 8.00 p.m. (Table 3).

Table 3. Times of meals taken by examined women in the term of interview, n=201 menus

| Meal | Hours | | | | | | | | |
|-----------------|------------------------------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 6.00-8.00 | 8.00-10.00 | 10.00-12.00 | 12.00-14.00 | 14.00-16.00 | 16.00-18.00 | 18.00-20.00 | 20.00-22.00 | 22.00-24.00 |
| | Percent of women eating given meal | | | | | | | | |
| Breakfast | 12 | 58 | 26 | 4 | | | | | |
| Lunch | | 6 | 56 | 38 | | | | | |
| Dinner | | | | 10 | 62 | 29 | | | |
| Afternoon snack | | | | | | 78 | 22 | | |
| Supper | | | | | | 6 | 52 | 42 | 3 |

Quantitative analysis of menus

In accordance with dietary recommendations, the energetic demand of women aged 18-25 years with moderate physical activity averages 2,450 kcal. Table 4 shows that diet delivered on average 57% of the recommended dietary caloric intake. Based on

individual assessment of meeting the caloric demand, the energetic value of menus exceeded 1,650 kcal in the case of only 29% of women, and no less than 21% of respondents did not exceed even 1,100 kcal. This deficiency was accompanied by insufficient intake of basic nutrients, as well as certain vitamins and minerals.

Table 4. Energy value and basic nutrients levels in daily food rations in women in the term of interview, $\bar{x} \pm SD$, n=201 menus

| Components | Intake | Daily allowance (%) |
|------------------------------------|-----------------|---------------------|
| Energy (kcal) | 1400 \pm 350 | 57 |
| Total protein (g) | 61.2 \pm 21 | 116 |
| Animal protein (g) | 42 \pm 19 | 233 |
| Total fat (g) | 51 \pm 16 | 62 |
| Cholesterol (mg) | 269 \pm 154 | 90 |
| Assimilable Carbohydrates (g) | 168 \pm 52 | 45 |
| Dietary fibre (g) | 14 \pm 6 | 56 |
| Sodium (mg) | 1420 \pm 492 | 95 |
| Potassium (mg) | 2624 \pm 512 | 56 |
| Calcium (mg) | 600 \pm 272.4 | 60 |
| Phosphorus (mg) | 1056 \pm 361 | 150 |
| Magnesium (mg) | 212 \pm 88 | 66 |
| Ferrum (mg) | 9.8 \pm 3.2 | 54 |
| Zinc (mg) | 7.4 \pm 2.2 | 93 |
| Copper (mg) | 0.89 \pm 0.3 | 99 |
| Retinol Equivalent (μ g) | 488 \pm 462 | 70 |
| Vitamin D ₃ (μ g) | 2.1 \pm 2 | 42 |
| Vitamin E (mg) | 6.5 \pm 2.7 | 81 |
| Vitamin C (mg) | 66 \pm 20 | 88 |
| Vitamin B ₁ (mg) | 0.8 \pm 0.3 | 73 |
| Vitamin B ₂ (mg) | 1.3 \pm 0.5 | 118 |
| Niacin (mg) | 12.5 \pm 6.6 | 89 |
| Vitamin B ₆ (mg) | 1.0 \pm 0.25 | 77 |
| Vitamin B ₁₂ (μ g) | 3.5 \pm 2.2 | 146 |
| Folate (μ g) | 292 \pm 108 | 73 |
| Water (g) | 1214 \pm 207 | 61 |

The analysis of nutritional value of menus has also showed deficiencies in fat and carbohydrates intake in women. Fat intake averaged 51 ± 16 g/day, which constituted only 62% of the recommended amount, while carbohydrate intake averaged 168 ± 52 g/day, which constituted 45% of recommended amount. It was reflected in insufficient intake of dietary fibre, vitamins A, D, E, C, B₁, folates, potassium, calcium, magnesium and iron. Only the consumption of copper and zinc complied with the recommended amounts. In contrast, protein intake was excessive, and the intake of animal proteins exceeded considerably the recommended 30% of total dietary protein. The average protein intake for the group of women under survey should be 18 g/day, and their average intake was ca. 42 ± 19 g/day which means that the recommended intake was exceeded by 233%. The excess of phosphorus found in the women's diets could result from excessive consumption of lunch meats – table 6 and the excess of vitamins B₂ and B₁₂ – from high consumption of eggs, poultry, milk and dairy products (Table 6). It should be also emphasized that despite the energetic deficiency and the presence of complex carbohydrates, the proportion of disaccharide such as saccharose and sweets in women's diets exceeded the permissible amounts twice. Moreover, the diets had also fluid deficiencies.

Table 5. Percentage contribution of main nutrients to energy intake in diets of examined women in the term of interview, n=201 menus

| Components | Recommended (%)* | Intake (%) |
|---------------|------------------|------------|
| Protein | 10-15 | 18.0 |
| Fats | 25-30 | 34.0 |
| Carbohydrates | 55-65 | 48.0 |

* Recommendations [5]

Also the proportion of energy derived from basic nutrients did not comply with dietary recommendations (Table 5). The proportion of energy derived from proteins and fat was found to exceed the recommended amounts. As a consequence, a deficiency of carbohydrates occurred, carbohydrates delivering only 48% of dietary caloric value compared to 65% recommended for this age group. Such discrepancies resulted from inappropriate structure of dietary components, and the respondents' choices were most frequently governed by the following criteria: current fashion (e.g. excessive consumption of cereals), taste preferences and convenience (excessive consumption of rennet cheese, lunch meats, eggs), necessity, in their opinion, to keep slim (insufficient consumption of bread, potatoes, pulses, fat), (Table 6).

Table 6. Consumption of the selected groups of products in daily food rations in women in the term of interview, n=201 menus

| Components (g) | Consumption (g) | Daily allowance (%) |
|-----------------------------------|-----------------|---------------------|
| Wheat and rye bread | 100 | 41 |
| Flour, pasta | 83 | 138 |
| Groats, rice, breakfast cereals | 145 | 483 |
| Potatoes | 121 | 40 |
| Vegetables | 413 | 83 |
| Pulses seeds and nuts | 2.2 | 10 |
| Fruits | 222 | 74 |
| Milk and milk fermented beverages | 480 | 96 |
| Fresh cheeses | 47 | 78 |
| Ripening cheeses | 20 | 133 |
| Meat, poultry | 114 | 134 |
| Sausages | 47.5 | 118 |
| Fish | 38 | 126 |
| Eggs | 67 | 403 |
| Animal fats | 23 | 115 |
| Vegetable fats | 26 | 130 |
| Mixed fats | 2 | 40 |
| Sugar and sweets | 94 | 209 |

DISCUSSION

Hormonal contraception is one of the most effective and most frequently used birth control methods. According to *Czerwińska-Osipiak et al.* [4] combined contraceptive pills are among the most commonly chosen contraceptives. The results of this survey have also confirmed that no less than 69% of respondents used such pills.

However, using the transdermal patch contraceptives is safer, as this administration route avoids the digestive system. Avoiding the so-called „first-pass through liver” brings also other benefits e.g. it has impact on the bioavailability of free androgens. When women take contraceptive pills, they often suffer from nausea which may reduce effectiveness of the pills, while such a risk does not occur when using transdermal patches. *Wilczak et al.* [22] reported that as much as 35% of women were guided by doctor's opinion when choosing oral contraceptive pills. Our survey has revealed that no less than 43% of respondents followed the doctor's orders, and 18% used the doctor's assistance and suggestions when choosing

contraceptives. Therefore, it may be concluded that doctors may have some impact on the fact that so few women (20% in the survey) use transdermal patches. All the more, that birth control was mentioned as the main reason for taking these contraceptives by no less than $\frac{3}{4}$ of respondents.

Survey studies among high school teenagers [7], as well as university students [20] have revealed that young people have insufficient knowledge about hormonal contraceptives. The results comply with our observations, as only 43% of our respondents believed they knew how their hormonal contraceptives worked. Regarding a general belief that oral contraceptive pills are safe, it seems important that doctors should give their patients every contraception-related advice and inform them of all the benefits and side effects related to the use of such contraceptives [16].

Taking medicines, hormonal pharmaceuticals in particular, has not only beneficial outcomes, but also side effects [18]. The most common side effects mentioned by the respondents were as follows: weight gain, depression, mood changes, migraines, headaches, low libido, spotting, varices, nausea and vomiting. The results of our survey, as well as those reported by other authors [18] show, that women usually report the same side effects as those most commonly mentioned in patient information leaflets attached to contraceptives. In our survey, similarly as in leaflets, the most frequently mentioned side effect was weight gain which was also the main reason for women to stop using hormonal contraceptives. However, a clinical research conducted by *Panjola* et al. [16] did not reveal any significant weight gain in women using hormonal contraception. The same results were obtained by *Ostrowska* et al. [13] in a survey carried out in Poland. However, our survey has shown that 1/3 of respondents using hormonal contraceptives did gain weight. Taking into consideration that the latest studies deny the impact of hormonal contraceptives on body weight gain, it seems that reasons for such a phenomenon should be looked for elsewhere. All the more, that weight gains observed by women had a negative impact on their dietary behaviours.

The results obtained in our survey on dietary choices of female respondents were typical to their gender and age [2], and they showed a number of nonconformities with the current dietary recommendations [5]. This paper discusses only these nonconformities that may enhance the side effects of hormonal contraceptives particularly with long term application.

The analysis of the respondents' menus has revealed their insufficient caloric value and incorrect proportions of basic nutrients, what was reflected in deficient intake of a number of vitamins and minerals involved in body metabolism.

Analysing the number and times of meals, it has been found that 76% of respondents had 4-5 meals a day, which followed the principles of healthy nutrition. Completely different results were obtained by *Pierzynowska* et al. [15] in a survey on young women, in which only 16% of respondents had the recommended number of meals, and as much as 84% had less than three meals a day. Considering the time difference between the survey carried out by *Pierzynowska* et al. [15] and our study, worth noticing is that the behaviour of young women in that respect has improved significantly and become more rational. Not much has changed, however, in the times of having the first and last meal. Only 12% of respondents had breakfast in the morning, and this meal significantly reduces blood viscosity which is increasing after it had decreased at night. Differently, as much as 45% of respondents had supper after 8 p.m. although they were usually perfectly aware that such behaviour was not proper. It seems that such nutritional behaviour could be one of the factors which create favourable conditions for fatty tissue to accumulate. Moreover, the evening meal is often the largest and of the highest caloric value.

Quantitative analysis of menus has shown, that they delivered on average 57% of the recommended dietary caloric intake. Despite such a low dietary caloric intake, the respondents' BMI values averaged 21.8, which was within the normal range (18.5 – 24.9).

In the analysed menus, excess proteins were observed, animal proteins in particular, along with deficiencies of vitamin B₆ and folates which are required for normal protein metabolism. This could result in a disturbed methionine metabolism and hyperhomocysteinemia. Taking into account the observed dietary excess of proteins combined with a pro-clotting effect of contraceptive pills [6], it seems that such a diet may increase the risk of cardiovascular diseases. Excessive consumption of animal proteins needlessly intensifies also the hepatic metabolism, which is undesirably intense anyway when oral contraceptive pills are taken [9]. It also increases the renal blood flow and glomerular filtration rate. But an increase in angiotensinogen concentration, stimulated by synthetic estrogen from contraceptive pills [12], in itself triggers a number of processes that result in increased blood pressure [4].

Fat consumption was also badly balanced. But although the daily recommended percent contribution of lipids to total energy intake was exceeded (a result of the diet's low caloric value), still their absolute amount was just slightly above the half of the reference value. This derived mainly from the belief shared by young women that fat is a dietary component significantly facilitating weight gain. The studied menus lacked also carbohydrates, polysaccharides in particular. This low carbohydrate intake resulted in, e.g., insufficient

intake of dietary fibre. An appropriate dietary level of fibre, through various mechanisms, beneficially affects the serum lipid profile and reduces arterial blood pressure [11]. It seems that such low amount of dietary fibre combined with oral contraceptive pills may increase the risk of cardiovascular diseases and facilitate weight gain. All the more that, along with deficient consumption of complex carbohydrates, the respondents consumed over 200% of the recommended amount of monosaccharides. Such proportion of simple sugars intake accompanied by dietary deficiency of vitamin B₆, that takes part in their metabolism, not only facilitates fat tissue accumulation [1] but also induces insulin resistance which is mentioned as one of the possible side effects of oral contraceptive pills.

Another observed deficiency resulting from an unbalanced diet, and linked significantly to the discussed issue, is the deficiency of vitamins B₃, B₆ and folates.

In women taking oral contraceptive pills, vitamin B₃ demand is increasing due to, e.g., impaired conversion of tryptophan to niacin [14]. Similarly, vitamin B₆ demand also increases. Vitamin B₆, along with folates, not only prevents an increase in homocysteine concentration, as mentioned before, but also participates in cholesterol metabolism and maintains blood glucose balance what generally prevents cardiovascular diseases. In such a context, insufficient potassium intake confirmed by our survey seems to be of importance as well, and the deficiency was a result of insufficient consumption of potatoes, vegetables and fruit. Dietary potassium deficiency reduces renal tubular reabsorption of calcium [10], the calcium intake by the surveyed women being as low as 60% of the recommended amount.

As the survey results show, weight gain reported by the respondents could not have been a direct result of excessive dietary caloric value, because their average energy intake covered barely 57% of the reference caloric intake. The reason for the weight gain was a summary effect of such factors as: insufficient fluid intake, excess proportion of saccharose combined with insufficient total carbohydrate intake (crude unprocessed polysaccharides in particular), excess proportion of proteins combined with deficiencies of vitamins and minerals that are of metabolic significance. All the said above, accompanied by incorrect time of meals with shifts to evenings, and too long intervals between meals, had to result in a number of disorders including excessive fat tissue accumulation.

To sum up, it should be said that nutritional choices of young women were incorrect in the light of dietary guidelines, and the observed deficiencies and excess along with the use of hormonal contraceptives increased the risk of cardiovascular diseases and other potential side effects of the therapy.

Therefore, spreading knowledge about the role of a well balanced diet among young women would be beneficial not only in the context of hormonal contraceptives they use, but also their future motherhood. The observed deficiencies, not only in macronutrients, but especially in vitamins A, D, E, and folates, iron, magnesium and calcium may hinder getting pregnant, carrying to term a normally developed fetus, and giving birth to a healthy baby. All the more that the use of contraceptives (usually long-term use) not only increases malnutrition but also establishes bad eating habits.

CONCLUSIONS

Analysis of the obtained results leads to the following conclusions:

1. Nutritional choices of the respondents were typical to their gender and age, but were not adjusted to the use of hormonal contraceptives,
2. The excess of proteins and simple sugars in the diet, accompanied by the deficiencies in vitamins involved in normal metabolism of proteins and carbohydrates, along with the use of oral contraceptive pills, create favorable conditions for carbohydrates and lipids imbalance, which may lead to cardiovascular diseases,
3. Side effects observed by the respondents, mainly weight gain, two-factor pill contraceptives application may have been a summary result of improper eating behaviours that facilitated accumulation of body fat and water.

Conflict of interest

The authors declare no conflict of interest.

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