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Evaluation of risk factors of the polymetabolic syndrome – the role of general practitioner in prevention

The X syndrome (known as a the polymetabolic syndrome) is a group of all-body disorders such as: abdominal obesity, improper glucose's tolerance, increased glucose concentrations, resistance to glucose, hypertension, lipoid disorders, myocardial ischemia.

Presently to the classical syndrome X, described by Reaven in 1988 (simultaneous occurrence of abdominal obesity, hyperglycemia, hypertension and lipoid disorders) have been attached a number of elements like: hyperuricaemia, increased cortisol's and fibrinogen's level, increased albumin's excretion with urine. Many scientists try to explain how these risk factors and coexisting diseases affect the creation of the syndrome X, therefore environmental and genetic factors are also taken into consideration. Probably part of a group of the syndrome X disorders may be genetically based, and the rest of them are indicators of the polymetabolic syndrome, and are useful in clinical diagnosis. It is difficult to separate genetic factors participation (which undoubtedly take part in the pathogenesis) from the influence of such factors as: the present-day lifestyle, an excess of calories, stress and no exercises.

Different mathematical models evaluating diverse correlation between risk factors of the syndrome X, have not explained their quantitative partaking. Therefore, in the presently obligatory definition of the polymetabolic syndrome, several risk factors are taken into consideration, which could envisage such disorders as circulatory diseases and adult diabetes. From "The Insulin Resistance Arteriosclerosis Study" (IRAS) published in 2005, it follows that the most important factor responsible for the development of the syndrome X is the size of the waistline (more than 89 cm among the women, and more than 102 cm among the men).

There are just few data about the appearance of the syndrome X, because of moderate unanimity as to the syndrome X diagnostic criteria, which were announced by The WHO and The Third National Health and Nutrition Examination Survey. Both definitions contain such factors as: increased glucose concentrations on the empty stomach, adult diabetes, hypertriglyceridemia and the low level of HDL-cholesterol. In The WHO's polymetabolic syndrome definition appear both obesity without evaluation of the sort and abdominal obesity. The hypertension criterion is also different, allows for the highest level. The differences in epidemiological evaluation of heart-circulation diseases complication result from differences in the syndrome X definitions.

The polymetabolic X disease index is high and has a tendency to increase in many countries. Even among teenagers this is a huge problem, which is connected with describing the syndrome X among the group of young people. It was estimated that about 25% people of middle age, both men and women, meet syndrome criteria. About 47 million of American people have the polymetabolic syndrome and this number is still increasing. The appearance of the syndrome X among people from

different European countries is estimated at 7–36% among men and 15–22% among women (ERIG sources). Results of Polish researches Pol–Monica are nearly the same and also indicate that this problem involves more and more people.

The aim of the study was the evaluation of risk factors present in patients with polymetabolic syndrome. Among 250 factors described in the worldwide literature, just several of them were taken into consideration: hypertension, the spontaneous level of glucose in serum, the cholesterol level, age, stimulants, the presence of diabetes, diet habits, exercise and abdominal obesity.

EXPERIMENTAL PROCEDURES

The study was conducted on 132 patients. Women who were more than 50 years old and men – over 40 years old were taken into consideration. The study was founded on a questionnaire filled by patients, physician's examination, results of the spontaneous level of glucose in serum and the cholesterol level. Most frequent factors marked by patients in the questionnaire were: hypertension, age (women > 55 years old, men > 40 years old), stimulants, the presence of diabetes, similar medical problems of close family members, improper diet habits and too little exercise.

RESULTS

Summing up the results from questionnaires there was established in percentage the number of patients with define quantity of risk factors. The biggest group was represented by patients with three risk factors, significantly fewer people marked seven risk factors.
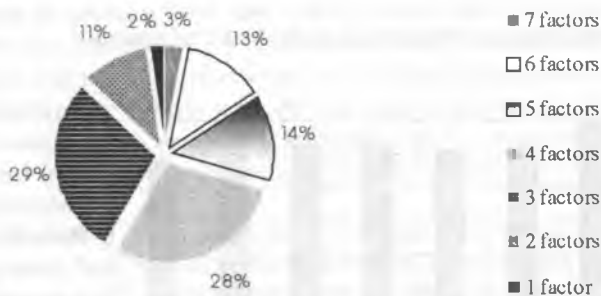

Fig. 1. Percentage number of patients according to the number of risk factors

The cholesterol level in all groups of the examined patients was high, but the highest level was noted in the group of patients with seven risk factors.
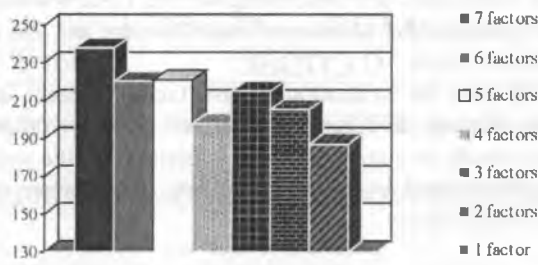
Fig. 2. The level of cholesterol (mg/dl) in the examined patients

The spontaneous level of glucose in serum spread out diversely in all groups of the examined patients.
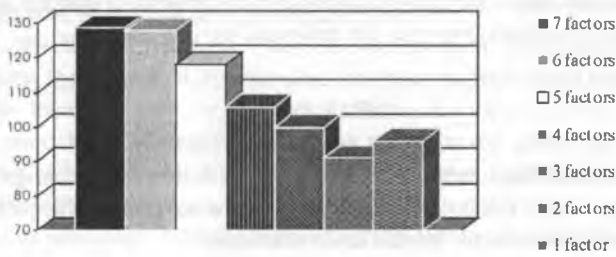

Fig. 3. The spontaneous level of glucose (mg/dl) in serum in the examined patients

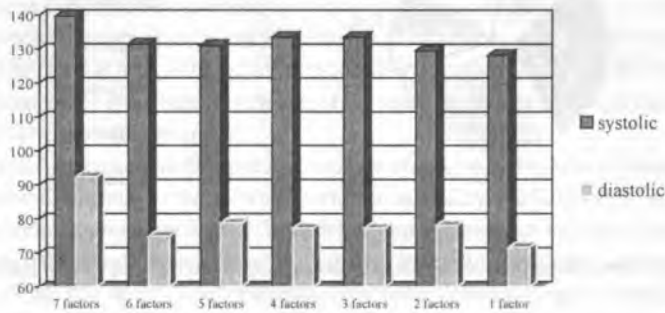Blood pressure was increased or high among all the examined patients.

Fig. 4. Blood systolic and diastolic pressure (mmHg) in the examined patients

Measurement of waistline allowed to determine that abdominal obesity was the biggest among patients with seven risk factors.
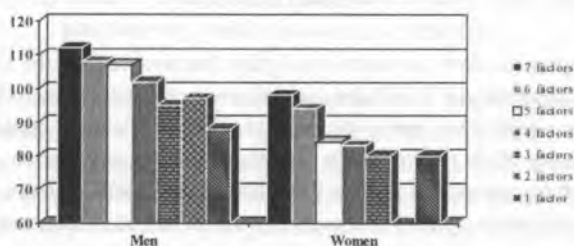
Fig. 5. Waistline (cm) in the examined patients

DISCUSSION

An analysis of the selected group of patients with defined risk factors of the polymetabolic syndrome indicates a significant diversity in the examined factor level, as well as different correlations between the discussed issues. Therefore, the attitude to the prophylaxis of the syndrome X should not be based only on one, even the most strong risk factor, but on interaction between individual factors. During treating one component of the syndrome X, potential, indirect influence on other syndrome disorders should be taken into consideration.

The presence of features of the polymetabolic syndrome cause the global risk of increasing incidence of heart diseases, and the risk of the adult diabetes incidence raises more than three times. The polymetabolic syndrome increases the risk of heart ischemia, heart attack and other complications of initial stages of arteriosclerosis to a greater degree than the diabetes on its own without any factor of the syndrome. The arteriosclerotic influence of the syndrome X factors results from cooperation of many substances, which damage arteries and cause heart ischemia. Reciprocal correlations between syndrome features are not equal. Body mass index correlates with all syndrome features, waistline with the level of insulin, hypertension and hypertriglyceridemia. Detection of one of the polymetabolic syndrome features is an indication for examination, whose aim is diagnosis or exclusion of the rest of syndrome disorders. The diabetes is not the only signal to provide examination, it can be also obesity, hypertension, hyperuricaemia and heart ischemia. Because in the initial stage features of the syndrome X do not appear at the same time, rather in different sequence with diverse intensity, this sort of conduction is justified.

Multifactorial etiology of the polymetabolic syndrome is the reason why this problem is of interdisciplinary nature. Early diagnosis of the syndrome X by physicians with different specializations may allow to prevent life threatening after-effects. However, success in treatment depends on patient's knowledge about this disease. It is well known that the polymetabolic syndrome occurs in patients who smoke cigarettes, drink alcohol in great amount, do not take exercise, have bad diet habits, are more than 50 years old. The great probability of appearance of the syndrome X concerns people with abdominal obesity, hypertension, lipoid disorders and improper glucose tolerance. The treatment consists in breaking the habits and dealing with obesity, which require patient's active attitude. This is life task to these patients and consists in changing diet habits and lifestyle. The condition of success in therapy is patient's understanding that obesity is a problem and strong enough motivation to overcome it.

CONCLUSIONS

In the clinical practice there are many proofs that first treatment of the adult diabetes without or with features of the syndrome X includes a non-pharmacological treatment. General practitioners as well as physicians with other specializations, who will be treating people with adult diabetes coexisting with features of the polymetabolic syndrome, should pay attention to observing diet and doing exercises by those patients. It is often forgotten that prevention is more easy and costs much less than treatment of diseases, which is of great importance in Polish economic situation.

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SUMMARY

The polymetabolic syndrome (known as the X syndrome) is a group of all-body disorders such as: abdominal obesity, improper glucose tolerance, increased insulin concentrations, resistance to glucose, hypertension, lipoid disorders, myocardial ischemia. Presently to the classical syndrome X, described by Reaven, there has been attached a number of elements like: hyperuricaemia, increased cortisol's and fibrinogen's level, increased albumin's excretion with urine. The aim of the study was an evaluation of risk factors present in patients with polymetabolic syndrome. Among 250 factors, described in the worldwide literature, just several of them were considered: hypertension, the spontaneous level of glucose in serum, cholesterol's level, age, stimulants, the presence of diabetes, diet habits, physical exercises, and abdominal obesity.

Analiza czynników ryzyka zespołu polimetabolicznego – rola lekarza
podstawowej opieki zdrowotnej w prewencji

Zespół polimetaboliczny (obecnie nazywany zespołem X) to zespół ogólnoustrojowych zaburzeń, na które składają się: otyłość wisceralna, upośledzona tolerancja glukozy, zwiększone stężenie insuliny, oporność na insulinę, nadciśnienie tętnicze, zaburzenia lipidowe, choroba niedokrwienna serca. Do klasycznego zespołu X, opisanego przez Reavena, dołączono obecnie szereg dodatkowych elementów, takich jak: dna moczanowa, podwyższenie poziomu kortyzolu, podwyższenie poziomu fibrynogenu oraz wzmożone wydalanie albumin z moczem. Celem pracy była analiza czynników ryzyka obecnych u pacjentów z zespołem polimetabolicznym. Spośród 250 czynników ryzyka opisywanych w światowej literaturze wzięto po uwagę: nadciśnienie tętnicze, poziom glikemii spontanicznej, poziom cholesterolu całkowitego, wiek, stosowanie używek, obecność cukrzycy, nawyki żywieniowe, aktywność fizyczną, otyłość typu brzusznego.